Language, Style and Format drivers
for Listings

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Abstract

This article describes the implementation of the language drivers for the listings package.

Contents

1 Installation and configuration

```
1 %% The listings package is copyright 1996--2004 Carsten Heinz, and
2 %% continued maintenance on the package is copyright 2006--2007 Brooks
3 %% Moses. From 2013 on the maintenance is done by Jobst Hoffmann.
4 %% The drivers are copyright 1997/1998/1999/2000/2001/2002/2003/2004/2006/
5 %% 2007/2013 any individual author listed in this file.
6 %%
7 %% This file is distributed under the terms of the LaTeX Project Public
8 %% License from CTAN archives in directory  macros/latex/base/lppl.txt.
9 %% Either version 1.3c or, at your option, any later version.
10 %%
11 %% This file is completely free and comes without any warranty.
12 %%
13 %% Send comments and ideas on the package, error reports and additional
14 %% programming languages to Jobst Hoffmann at <j.hoffmann@fh-aachen.de>.
15 %%

16 ⟨∗install⟩
17 \input docstrip
18 \preamble
19 \endpreamble
20
21 \ifToplevel{
22 \usedir{tex/latex/listings}
23 \keepsilent
24 \askonceonly
25 }
```

3

```
26
27
28 \generate{
29     \file{lstlang1.sty}{\from{lstdrvrs.dtx}{lang1}}
30     \file{lstlang2.sty}{\from{lstdrvrs.dtx}{lang2}}
31     \file{lstlang3.sty}{\from{lstdrvrs.dtx}{lang3}}
32 }
33
34 \generate{
35     \file{listings-acm.prf}{\from{lstdrvrs.dtx}{acm-prf}}
36     \file{listings-bash.prf}{\from{lstdrvrs.dtx}{bash-prf}}
37     \file{listings-fortran.prf}{\from{lstdrvrs.dtx}{fortran-prf}}
38     \file{listings-hansl.prf}{\from{lstdrvrs.dtx}{hansl-prf}}
39     \file{listings-lua.prf}{\from{lstdrvrs.dtx}{lua-prf}}
40     \file{listings-python.prf}{\from{lstdrvrs.dtx}{python-prf}}
41     \file{listings-rexx.prf}{\from{lstdrvrs.dtx}{rexx-prf}}
42 }
43
44
45 \ifToplevel{
46 \Msg{*}
47 \Msg{* You probably need to move all created '.sty' and '.cfg'}
48 \Msg{* files into a directory searched by TeX.}
49 \Msg{*}
50 \Msg{* Run 'lstdrvrs.dtx' through LaTeX2e to get the documentation.}
51 \Msg{*}
52 }
53
54 \endbatchfile
55 ⟨/install⟩
56 ⟨∗config⟩
```

We mainly define default dialects.

```
57 \ProvidesFile{listings.cfg}[2024/03/11 1.10a listings configuration]
58 \def\lstlanguagefiles
59     {lstlang0.sty,lstlang1.sty,lstlang2.sty,lstlang3.sty}
60 \lstset{defaultdialect=[R/3 6.10]ABAP,
61         defaultdialect=[2005]Ada,
62         defaultdialect=[68]Algol,
63         defaultdialect=[gnu]Awk,
64         defaultdialect=[ANSI]C,
65         defaultdialect=[light]Caml,
66         defaultdialect=[1985]Cobol,
67         defaultdialect=[WinXP]command.com,
68         defaultdialect=[ISO]C++,
69         defaultdialect=[95]Fortran,
70         defaultdialect=[11.0]Mathematica,
71         defaultdialect=[OMG]OCL,
72         defaultdialect=[Standard]Pascal,
73         defaultdialect=[67]Simula,
```

```
74          defaultdialect=[plain]TeX,
75          defaultdialect=[97]VRML}
76 \lstalias[]{TclTk}[tk]{tcl}
```

And now some shortcuts for the ABAP versions (provided by Knut Lickert). I (Knut) think the leading R/2, R/3 is not necessary (The support for R/2 is finished). The version number with letter is important for the runtime-system, but the programming language should be the same for each version.

```
77 \lstalias[6.1]{ABAP}[R/3 6.10]{ABAP}
78 \lstalias[3.1]{ABAP}[R/3 3.1C]{ABAP}
79 \lstalias[4.6]{ABAP}[R/3 4.6C]{ABAP}

80 ⟨/config⟩

81 ⟨+lang1⟩\ProvidesFile{lstlang1.sty}
82 ⟨+lang2⟩\ProvidesFile{lstlang2.sty}
83 ⟨+lang3⟩\ProvidesFile{lstlang3.sty}
84 ⟨+acm-prf⟩\ProvidesFile{listings-acm.prf}
85 ⟨+bash-prf⟩\ProvidesFile{listings-bash.prf}
86 ⟨+fortran-prf⟩\ProvidesFile{listings-fortran.prf}
87 ⟨+hansl-prf⟩\ProvidesFile{listings-hansl.prf}
88 ⟨+lua-prf⟩\ProvidesFile{listings-lua.prf}
89 ⟨+python-prf⟩\ProvidesFile{listings-python.prf}
90 ⟨+rexx-prf⟩\ProvidesFile{listings-rexx.prf}
91 ⟨-config⟩     [2024/03/11 1.10a listings language file]
```

2 Language drivers

2.1 Abap

Knut Lickert added support for Abap.[1]

```
92 ⟨∗lang2⟩

93 %%
94 %% Abap definition by Knut Lickert
95 %%
```

There are some other new commands in release 6.10. They will follow later, but up to now I don't work with 6.10.

```
96 \lst@definelanguage[R/3 6.10]{ABAP}[R/3 4.6C]{ABAP}%
97   {morekeywords={try,endtry},%
98   }[keywords,comments,strings]

99 \lst@definelanguage[R/3 4.6C]{ABAP}[R/3 3.1]{ABAP}%
100   {morekeywords={method,ref,class,create,object,%
101        methods,endmethod,private,protected,public,section,%
102        catch,system-exceptions,endcatch,%
103        },%
104   moreprocnamekeys={class},%
```

---

[1]In this section 'I' is Knut Lickert.

```
105    literate={->}{{$\rightarrow$}}1{=>}{{$\Rightarrow$}}1,%
106    }[keywords,comments,strings,procnames]
```

Yes there are also some more releases in R/3 (2.1...), but I know them not really. So let's start with R/3 3.1.

```
107 \lst@definelanguage[R/3 3.1]{ABAP}[R/2 5.0]{ABAP}{}%
```

As I remember all this commands exists in R/2. Many commands are new in R/2 5.0 (compared with R/2 4.3). But as I am not using R/2 4.3 any more, I start with R/2 5.0.

```
108 \lst@definelanguage[R/2 5.0]{ABAP}{%
109    sensitive=f,%
110    procnamekeys={report,program,form,function,module},%
111    morekeywords={*, add, after, alias, analyzer, and, append, appending,%
112      area, assign, at, authority-check, before, binary, blank, break-point,%
113      calendar, call, case, change, changing, check, clear, cnt, co, collect,%
114      commit, common, component, compute, condense, corresponding, cos, cp,%
115      cs, currency-conversion, cursor, data, database, dataset, decimals,%
116      define, delete, deleting, dequeue, describe, detail, dialog, directory,%
117      div, divide, do, documentation, during, dynpro, else, end-of-page,%
118      end-of-selection, endat, endcase, enddo, endfor, endform, endif,%
119      endloop, endmodule, endselect, endwhile, enqueue, exceptions, exit,%
120      exp, export, exporting, extract, field, fields, field-groups,%
121      field-symbols, find, for, form, format, free, from, function,%
122      generating, get, giving, hide, id, if, import, importing, in, incl,%
123      include, initial, initialization, input, insert, interrupt, into, is,%
124      language, leave, leading, left-justified, like, line, lines,%
125      line-count, line-selection, list-processing, load, local, log, logfile,%
126      loop, margin, mark, mask, memory, menue, message, mod, modify, module,%
127      move, move-text, multiply, na, new, new-line, new-page, no-gaps, np,%
128      ns, number, obligatory, occurs, of, on, or, others, output, parameter,%
129      parameters, parts, perform, pf-status, places, position, process,%
130      raise, raising, ranges, read, refresh, refresh-dynpro, reject, remote,%
131      replace, report, reserve, reset, restart, right-justified, run, screen,%
132      scroll, search, segments, select, select-options, selection-screen,%
133      set, shift, sin, single, sqrt, start-of-selection, statement,%
134      structure, submit, subtract, summary, summing, suppress, system, table,%
135      tables, task, text, time, to, top-of-page, trace, transaction,%
136      transfer, transfer-dynpro, translate, type, unpack, update,%
137      user-command, using, value, when, where, while, window, with, workfile,%
138      write},%
139    morecomment=[l]",%
140    morecomment=[f][commentstyle][0]*,%
141    morestring=[d]'%
142 }[keywords,comments,strings,procnames]
```

This section for R/2 4.3 is not really maintained. It is just what I remember of the past.

```
143 \lst@definelanguage[R/2 4.3]{ABAP}[R/2 5.0]{ABAP}%
144    {deletekeywords={function,importing,exporting,changing,exceptions,%
```

```
145        raise,raising}%
146    }[keywords,comments,strings]
```
147 ⟨/lang2⟩

2.2   ACM

ACM is the language of the Aspen Custom Modeler ([http://www.aspentech.](http://www.aspentech.com/products/aspen-custom-modeler.aspx)[com/products/aspen-custom-modeler.aspx](http://www.aspentech.com/products/aspen-custom-modeler.aspx)), the language definition was provided by Stefan Pinnow. It is intended for writing models. Maximilian Dammann pointed out the missing keyword "Description".

148 ⟨∗lang2⟩

```
149 %%
150 %% ACM and ACMscript definition
151 %% (c) 2013 Stefan Pinnow
152 %%
153 \lst@definelanguage{ACM}{%
154   morekeywords={ abs, After, acos, And, As, asin, atan, At, Call,%
155     Compatibility, Connect, cos, cosh, Create, Delay, Description,%
156     Difference, Do, Else, ElseIf, End, EndFor, EndIf, EndParallel,%
157     EndState, EndSwitch, EndText, EndWith, exp, External, Fixed, For,%
158     ForEach, Free, Global, Hidden, If, Implementation, In, Initial, Input,%
159     InterSection, IntegerSet, Invoke, Is, Language, Library, Link, Log10,%
160     LogE, Max, Min, Model, Of, Once, Options, Output, Parallel, Parameter,%
161     Pause, Port, Print, Private, Procedure, Product, Ramp, Repeat, Restart,%
162     Return, Round, Runs, Sigma, sin, sinh, Size, SnapShot, sqr, sqrt,%
163     SRamp, State, Stream, StringSet, Structure, Switch, SubRoutine,%
164     SymDiff, tan, tanh, Task, Text, Time, Then, Truncate, Union, Until,%
165     Uses, Variable, Wait, When, With, WithIn, WorkSpace},%
166   sensitive=false,%
167   morecomment=[l]{//},%
168   morecomment=[s]{/*}{*/},%
169   string=[b]{"},%
170 }[keywords,comments,strings]
```
171 ⟨/lang2⟩

In addition to writing models there is a language ACMscript, which is similar to VBScript. According to Stefan Pinnow this language is used for writing scripts for the models.

172 ⟨∗lang2⟩

```
173 \lst@definelanguage{ACMscript}[]{VBScript}{%
174   morekeywords={%
175     ElseIf,False,In,Resume,True%
176   },%
177   deletekeywords={%
178     Abs,Array,Clear,CreateObject,CStr,Err,ForReading,ForWriting,%
179     OpenTextFile,Replace,WriteLine%
180   }%
181 }[keywords,comments,strings]
```

182 ⟨/lang2⟩

Stefan Pinnow also supplied a definition of a style for printing ACM code:

183 ⟨∗acm-prf⟩

184 \usepackage[rgb, x11names]{xcolor}

185

186 \definecolor{Comments}{rgb}{0.00,0.50,0.00}
187 \definecolor{KeyWords}{rgb}{0.00,0.00,0.63}
188 \definecolor{Strings}{rgb}{0.84,0.00,0.00}

189

190 \lstdefinestyle{ACM}{%
191   basicstyle=\scriptsize\ttfamily,%
192   keywordstyle=\color{KeyWords},%
193   showstringspaces=false,%
194   identifierstyle=\color{black},%
195   commentstyle=\color{Comments},%
196   stringstyle=\color{Strings},%
197   frame=shadowbox,%   % for ACM-Code scrartcl commented out
198 %   frame=l,%   % line on the left side
199   rulesepcolor=\color{black},%
200   numbers=left,%   % left
201   firstnumber=1,%
202   stepnumber=5,%
203   columns=fixed,%   % to prevent inserting spaces
204   fontadjust=true,%
205   basewidth=0.5em,%
206   captionpos=t,%
207   abovecaptionskip=\smallskipamount,% same amount as default
208   belowcaptionskip=\smallskipamount,% in caption package
209 }%

This code is provided in the file `listings-acm.prf`, see section 2.4.1 (Preferences) of the listings documentation.

210 ⟨/acm-prf⟩

2.3   ACSL

This language was provided by Andreas Matthias. I'm sorry for forgetting to add this language for a long time.

211 ⟨∗lang1⟩

212 %%
213 %% ACSL definition (c) 2000 by Andreas Matthias
214 %%
215 \lst@definelanguage{ACSL}[90]{Fortran}%
216   {morekeywords={algorithm,cinterval,constant,derivative,discrete,%
217   dynamic,errtag,initial,interval,maxterval,minterval,%
218   merror,xerror,nsteps,procedural,save,schedule,sort,%
219   table,terminal,termt,variable},%
220   sensitive=false,%

```
221    morecomment=[l]!%
222   }[keywords, comments]%
```

223 ⟨/lang1⟩

2.4   Ada

Data come from

- BARNES, JOHN GILBERT PRESSLIE: **Programming in Ada plus language reference manual**; © 1991 Addison-Wesley Publishing Company, Inc.; ISBN 0-201-56539-0.

Torsten Neuer added support for Ada 95. I changed the definition to reduce the required string memory.

224 ⟨∗lang1⟩

```
225 %%
226 %% Ada 95 definition (c) Torsten Neuer
227 %%
228 %% Ada 2005 definition (c) 2006 Santiago Urue\~{n}a Pascual
229 %%                          <Santiago.Uruena@upm.es>
230 %%
231 \lst@definelanguage[2005]{Ada}[95]{Ada}%
232   {morekeywords={interface,overriding,synchronized}}%
```

```
233 \lst@definelanguage[95]{Ada}[83]{Ada}%
234   {morekeywords={abstract,aliased,protected,requeue,tagged,until}}%
```

```
235 \lst@definelanguage[83]{Ada}%
236   {morekeywords={abort,abs,accept,access,all,and,array,at,begin,body,%
237       case,constant,declare,delay,delta,digits,do,else,elsif,end,entry,%
238       exception,exit,for,function,generic,goto,if,in,is,limited,loop,%
239       mod,new,not,null,of,or,others,out,package,pragma,private,%
240       procedure,raise,range,record,rem,renames,return,reverse,select,%
241       separate,subtype,task,terminate,then,type,use,when,while,with,%
242       xor},%
243   sensitive=f,%
244   morecomment=[l]--,%
245   morestring=[m]",% percent not defined as stringizer so far
246   morestring=[m]'%
247   }[keywords,comments,strings]
```

248 ⟨/lang1⟩

2.5   Algol

Data come from

- UWE PAPE: **Programmieren in ALGOL 60**; © 1973 Carl Hanser Verlag München; ISBN 3-446-11605-2

- FRANK G. PAGAN: **A practical guide to ALGOL 68**; © 1976 by John Wiley & Sohn Ltd.; ISBN 0-471-65746-8 (Cloth); ISBN 0-471-65747-6 (Pbk).

The definition of Algol 68 doesn't support comments enclosed by ¢.

```
249 ⟨∗lang3⟩

250 \lst@definelanguage[68]{Algol}%
251 % ??? should 'i' be a keyword
252   {morekeywords={abs,and,arg,begin,bin,bits,bool,by,bytes,case,channel,%
253       char,co,comment,compl,conj,divab,do,down,elem,elif,else,empty,%
254       end,entier,eq,esac,exit,false,fi,file,flex,for,format,from,ge,%
255       goto,gt,heap,if,im,in,int,is,isnt,le,leng,level,loc,long,lt,lwb,%
256       minusab,mod,modab,mode,ne,nil,not,od,odd,of,op,or,ouse,out,over,%
257       overab,par,plusab,plusto,pr,pragmat,prio,proc,re,real,ref,repr,%
258       round,sema,shl,short,shorten,shr,sign,skip,string,struct,then,%
259       timesab,to,true,union,up,upb,void,while},%
260   sensitive=f,% ???
261   morecomment=[s]{\#}{\#},%
262   keywordcomment={co,comment}%
263   }[keywords,comments,keywordcomments]%

264 \lst@definelanguage[60]{Algol}%
265   {morekeywords={array,begin,Boolean,code,comment,div,do,else,end,%
266       false,for,goto,if,integer,label,own,power,procedure,real,step,%
267       string,switch,then,true,until,value,while},%
268   sensitive=f,% ???
269   keywordcommentsemicolon={end}{else,end}{comment}%
270   }[keywords,keywordcomments]%
271 ⟨/lang3⟩
```

2.6 Assembler

Credits go to Michael Franke.

```
272 ⟨∗lang3⟩
273 %%
274 %% Motorola 68K definition (c) 2006 Michael Franke
275 %%
276 \lst@definelanguage[Motorola68k]{Assembler}{%
277   morekeywords={ABCD,ADD,%
278     ADDA,ADDI,ADDQ,ADDX,AND,ANDI,ASL,ASR,BCC,BLS,BCS,BLT,BEQ,BMI,BF,BNE,%
279     BGE,BPL,BGT,BT,BHI,BVC,BLE,BVS,BCHG,BCLR,BRA,BSET,BSR,BTST,CHK,CLR,%
280     CMP,CMPA,CMPI,CMPM,DBCC,DBLS,DBCS,DBLT,DBEQ,DBMI,DBF,DBNE,DBGE,DBPL,%
281     DBGT,DBT,DBHI,DBVC,DBLE,DBVS,DIVS,DIVU,EOR,EORI,EXG,EXT,ILLEGAL,JMP,%
282     JSR,LEA,LINK,LSL,LSR,MOVE,MOVEA,MOVEM,MOVEP,MOVEQ,MULS,MULU,NBCD,NEG,%
283     NEGX,NOP,NOT,OR,ORI,PEA,RESET,ROL,ROR,ROXL,ROXR,RTE,RTR,RTS,SBCD,%
284     SCC,SLS,SCS,SLT,SEQ,SMI,SF,SNE,SGE,SPL,SGT,ST,SHI,SVC,SLE,SVS,STOP,%
285     SUB,SUBA,SUBI,SUBQ,SUBX,SWAP,TAS,TRAP,TRAPV,TST,UNLK},%
286   sensitive=false,%
287   morecomment=[l]*,%
288   morecomment=[l];%
```

10

```
289    }[keywords,comments,strings]
290 ⟨/lang3⟩
```

Credits go to Andrew Zabolotny.

```
291 ⟨∗lang3⟩
292 %%
293 %% x86masm definition (c) 2002 Andrew Zabolotny
294 %%
295 \lst@definelanguage[x86masm]{Assembler}%
296   {morekeywords={al,ah,ax,eax,bl,bh,bx,ebx,cl,ch,cx,ecx,dl,dh,dx,edx,%
297       si,esi,di,edi,bp,ebp,sp,esp,cs,ds,es,ss,fs,gs,cr0,cr1,cr2,cr3,%
298       db0,db1,db2,db3,db4,db5,db6,db7,tr0,tr1,tr2,tr3,tr4,tr5,tr6,tr7,%
299       st,aaa,aad,aam,aas,adc,add,and,arpl,bound,bsf,bsr,bswap,bt,btc,%
300       btr,bts,call,cbw,cdq,clc,cld,cli,clts,cmc,cmp,cmps,cmpsb,cmpsw,%
301       cmpsd,cmpxchg,cwd,cwde,daa,das,dec,div,enter,hlt,idiv,imul,in,%
302       inc,ins,int,into,invd,invlpg,iret,ja,jae,jb,jbe,jc,jcxz,jecxz,%
303       je,jg,jge,jl,jle,jna,jnae,jnb,jnbe,jnc,jne,jng,jnge,jnl,jnle,%
304       jno,jnp,jns,jnz,jo,jp,jpe,jpo,js,jz,jmp,lahf,lar,lea,leave,lgdt,%
305       lidt,lldt,lmsw,lock,lods,lodsb,lodsw,lodsd,loop,loopz,loopnz,%
306       loope,loopne,lds,les,lfs,lgs,lss,lsl,ltr,mov,movs,movsb,movsw,%
307       movsd,movsx,movzx,mul,neg,nop,not,or,out,outs,pop,popa,popad,%
308       popf,popfd,push,pusha,pushad,pushf,pushfd,rcl,rcr,rep,repe,%
309       repne,repz,repnz,ret,retf,rol,ror,sahf,sal,sar,sbb,scas,seta,%
310       setae,setb,setbe,setc,sete,setg,setge,setl,setle,setna,setnae,%
311       setnb,setnbe,setnc,setne,setng,setnge,setnl,setnle,setno,setnp,%
312       setns,setnz,seto,setp,setpe,setpo,sets,setz,sgdt,shl,shld,shr,%
313       shrd,sidt,sldt,smsw,stc,std,sti,stos,stosb,stosw,stosd,str,sub,%
314       test,verr,verw,wait,wbinvd,xadd,xchg,xlatb,xor,fabs,fadd,fbld,%
315       fbstp,fchs,fclex,fcom,fcos,fdecstp,fdiv,fdivr,ffree,fiadd,ficom,%
316       fidiv,fidivr,fild,fimul,fincstp,finit,fist,fisub,fisubr,fld,fld1,%
317       fldl2e,fldl2t,fldlg2,fldln2,fldpi,fldz,fldcw,fldenv,fmul,fnop,%
318       fpatan,fprem,fprem1,fptan,frndint,frstor,fsave,fscale,fsetpm,%
319       fsin,fsincos,fsqrt,fst,fstcw,fstenv,fstsw,fsub,fsubr,ftst,fucom,%
320       fwait,fxam,fxch,fxtract,fyl2x,fyl2xp1,f2xm1},%
321     morekeywords=[2]{.align,.alpha,assume,byte,code,comm,comment,.const,%
322       .cref,.data,.data?,db,dd,df,dosseg,dq,dt,dw,dword,else,end,endif,%
323       endm,endp,ends,eq,equ,.err,.err1,.err2,.errb,.errdef,.errdif,%
324       .erre,.erridn,.errnb,.errndef,.errnz,event,exitm,extrn,far,%
325       .fardata,.fardata?,fword,ge,group,gt,high,if,if1,if2,ifb,ifdef,%
326       ifdif,ife,ifidn,ifnb,ifndef,include,includelib,irp,irpc,label,%
327       .lall,le,length,.lfcond,.list,local,low,lt,macro,mask,mod,.model,%
328       name,ne,near,offset,org,out,page,proc,ptr,public,purge,qword,.%
329       radix,record,rept,.sall,seg,segment,.seq,.sfcond,short,size,%
330       .stack,struc,subttl,tbyte,.tfcond,this,title,type,.type,width,%
331       word,.xall,.xcref,.xlist},%
332     alsoletter=.,alsodigit=?,%
333     sensitive=f,%
334     morestring=[b]",%
335     morestring=[b]',%
336     morecomment=[l];%
```

```
337    }[keywords,comments,strings]
338 ⟨/lang3⟩
```

2.7 Awk

Thanks to Dr. Christoph Giess for providing these definitions.

```
339 ⟨*lang1⟩
340 %%
341 %% awk definitions (c) Christoph Giess
342 %%
343 \lst@definelanguage[gnu]{Awk}[POSIX]{Awk}%
344   {morekeywords={and,asort,bindtextdomain,compl,dcgettext,gensub,%
345       lshift,mktime,or,rshift,strftime,strtonum,systime,xor,extension}%
346   }%
347 \lst@definelanguage[POSIX]{Awk}%
348   {keywords={BEGIN,END,close,getline,next,nextfile,print,printf,%
349       system,fflush,atan2,cos,exp,int,log,rand,sin,sqrt,srand,gsub,%
350       index,length,match,split,sprintf,strtonum,sub,substr,tolower,%
351       toupper,if,while,do,for,break,continue,delete,exit,function,%
352       return},%
353    sensitive,%
354    morecomment=[l]\#,%
355    morecomment=[l]//,%
356    morecomment=[s]{/*}{*/},%
357    morestring=[b]"%
358   }[keywords,comments,strings]
359 ⟨/lang1⟩
```

2.8 Basic

Credits go to Robert Frank.

```
360 ⟨*lang1⟩
361 %%
362 %% Visual Basic definition (c) 2002 Robert Frank
363 %%
364 \lst@definelanguage[Visual]{Basic}
365   {morekeywords={Abs,Array,Asc,AscB,AscW,Atn,Avg,CBool,CByte,CCur,%
366       CDate,CDbl,Cdec,Choose,Chr,ChrB,ChrW,CInt,CLng,Command,Cos,%
367       Count,CreateObject,CSng,CStr,CurDir,CVar,CVDate,CVErr,Date,%
368       DateAdd,DateDiff,DatePart,DateSerial,DateValue,Day,DDB,Dir,%
369       DoEvents,Environ,EOF,Error,Exp,FileAttr,FileDateTime,FileLen,%
370       Fix,Format,FreeFile,FV,GetAllStrings,GetAttr,%
371       GetAutoServerSettings,GetObject,GetSetting,Hex,Hour,IIf,%
372       IMEStatus,Input,InputB,InputBox,InStr,InstB,Int,Integer,IPmt,%
373       IsArray,IsDate,IsEmpty,IsError,IsMissing,IsNull,IsNumeric,%
374       IsObject,LBound,LCase,Left,LeftB,Len,LenB,LoadPicture,Loc,LOF,%
375       Log,Ltrim,Max,Mid,MidB,Min,Minute,MIRR,Month,MsgBox,Now,NPer,%
376       NPV,Oct,Partition,Pmt,PPmt,PV,QBColor,Rate,RGB,Right,RightB,Rnd,%
```

```
377        Rtrim,Second,Seek,Sgn,Shell,Sin,SLN,Space,Spc,Sqr,StDev,StDevP,%
378        Str,StrComp,StrConv,String,Switch,Sum,SYD,Tab,Tan,Time,Timer,%
379        TimeSerial,TimeValue,Trim,TypeName,UBound,Ucase,Val,Var,VarP,%
380        VarType,Weekday,Year},% functions
381    morekeywords=[2]{Accept,Activate,Add,AddCustom,AddFile,AddFromFile,%
382        AddFromTemplate,AddItem,AddNew,AddToAddInToolbar,%
383        AddToolboxProgID,Append,AppendChunk,Arrange,Assert,AsyncRead,%
384        BatchUpdate,BeginTrans,Bind,Cancel,CancelAsyncRead,CancelBatch,%
385        CancelUpdate,CanPropertyChange,CaptureImage,CellText,CellValue,%
386        Circle,Clear,ClearFields,ClearSel,ClearSelCols,Clone,Close,Cls,%
387        ColContaining,ColumnSize,CommitTrans,CompactDatabase,Compose,%
388        Connect,Copy,CopyQueryDef,CreateDatabase,CreateDragImage,%
389        CreateEmbed,CreateField,CreateGroup,CreateIndex,CreateLink,%
390        CreatePreparedStatement,CreatePropery,CreateQuery,%
391        CreateQueryDef,CreateRelation,CreateTableDef,CreateUser,%
392        CreateWorkspace,Customize,Delete,DeleteColumnLabels,%
393        DeleteColumns,DeleteRowLabels,DeleteRows,DoVerb,Drag,Draw,Edit,%
394        EditCopy,EditPaste,EndDoc,EnsureVisible,EstablishConnection,%
395        Execute,ExtractIcon,Fetch,FetchVerbs,Files,FillCache,Find,%
396        FindFirst,FindItem,FindLast,FindNext,FindPrevious,Forward,%
397        GetBookmark,GetChunk,GetClipString,GetData,GetFirstVisible,%
398        GetFormat,GetHeader,GetLineFromChar,GetNumTicks,GetRows,%
399        GetSelectedPart,GetText,GetVisibleCount,GoBack,GoForward,Hide,%
400        HitTest,HoldFields,Idle,InitializeLabels,InsertColumnLabels,%
401        InsertColumns,InsertObjDlg,InsertRowLabels,InsertRows,Item,%
402        KillDoc,Layout,Line,LinkExecute,LinkPoke,LinkRequest,LinkSend,%
403        Listen,LoadFile,LoadResData,LoadResPicture,LoadResString,%
404        LogEvent,MakeCompileFile,MakeReplica,MoreResults,Move,MoveData,%
405        MoveFirst,MoveLast,MoveNext,MovePrevious,NavigateTo,NewPage,%
406        NewPassword,NextRecordset,OLEDrag,OnAddinsUpdate,OnConnection,%
407        OnDisconnection,OnStartupComplete,Open,OpenConnection,%
408        OpenDatabase,OpenQueryDef,OpenRecordset,OpenResultset,OpenURL,%
409        Overlay,PaintPicture,Paste,PastSpecialDlg,PeekData,Play,Point,%
410        PopulatePartial,PopupMenu,Print,PrintForm,PropertyChanged,Pset,%
411        Quit,Raise,RandomDataFill,RandomFillColumns,RandomFillRows,%
412        rdoCreateEnvironment,rdoRegisterDataSource,ReadFromFile,%
413        ReadProperty,Rebind,ReFill,Refresh,RefreshLink,RegisterDatabase,%
414        Reload,Remove,RemoveAddInFromToolbar,RemoveItem,Render,%
415        RepairDatabase,Reply,ReplyAll,Requery,ResetCustom,%
416        ResetCustomLabel,ResolveName,RestoreToolbar,Resync,Rollback,%
417        RollbackTrans,RowBookmark,RowContaining,RowTop,Save,SaveAs,%
418        SaveFile,SaveToFile,SaveToolbar,SaveToOle1File,Scale,ScaleX,%
419        ScaleY,Scroll,Select,SelectAll,SelectPart,SelPrint,Send,%
420        SendData,Set,SetAutoServerSettings,SetData,SetFocus,SetOption,%
421        SetSize,SetText,SetViewport,Show,ShowColor,ShowFont,ShowHelp,%
422        ShowOpen,ShowPrinter,ShowSave,ShowWhatsThis,SignOff,SignOn,Size,%
423        Span,SplitContaining,StartLabelEdit,StartLogging,Stop,%
424        Synchronize,TextHeight,TextWidth,ToDefaults,TwipsToChartPart,%
425        TypeByChartType,Update,UpdateControls,UpdateRecord,UpdateRow,%
426        Upto,WhatsThisMode,WriteProperty,ZOrder},% methods
```

```
427    morekeywords=[3]{AccessKeyPress,AfterAddFile,AfterChangeFileName,%
428        AfterCloseFile,AfterColEdit,AfterColUpdate,AfterDelete,%
429        AfterInsert,AfterLabelEdit,AfterRemoveFile,AfterUpdate,%
430        AfterWriteFile,AmbienChanged,ApplyChanges,Associate,%
431        AsyncReadComplete,AxisActivated,AxisLabelActivated,%
432        AxisLabelSelected,AxisLabelUpdated,AxisSelected,%
433        AxisTitleActivated,AxisTitleSelected,AxisTitleUpdated,%
434        AxisUpdated,BeforeClick,BeforeColEdit,BeforeColUpdate,%
435        BeforeConnect,BeforeDelete,BeforeInsert,BeforeLabelEdit,%
436        BeforeLoadFile,BeforeUpdate,ButtonClick,ButtonCompleted,%
437        ButtonGotFocus,ButtonLostFocus,Change,ChartActivated,%
438        ChartSelected,ChartUpdated,Click,ColEdit,Collapse,ColResize,%
439        ColumnClick,Compare,ConfigChageCancelled,ConfigChanged,%
440        ConnectionRequest,DataArrival,DataChanged,DataUpdated,DblClick,%
441        Deactivate,DeviceArrival,DeviceOtherEvent,DeviceQueryRemove,%
442        DeviceQueryRemoveFailed,DeviceRemoveComplete,DeviceRemovePending,%
443        DevModeChange,Disconnect,DisplayChanged,Dissociate,%
444        DoGetNewFileName,Done,DonePainting,DownClick,DragDrop,DragOver,%
445        DropDown,EditProperty,EnterCell,EnterFocus,Event,ExitFocus,%
446        Expand,FootnoteActivated,FootnoteSelected,FootnoteUpdated,%
447        GotFocus,HeadClick,InfoMessage,Initialize,IniProperties,%
448        ItemActivated,ItemAdded,ItemCheck,ItemClick,ItemReloaded,%
449        ItemRemoved,ItemRenamed,ItemSeletected,KeyDown,KeyPress,KeyUp,%
450        LeaveCell,LegendActivated,LegendSelected,LegendUpdated,%
451        LinkClose,LinkError,LinkNotify,LinkOpen,Load,LostFocus,%
452        MouseDown,MouseMove,MouseUp,NodeClick,ObjectMove,%
453        OLECompleteDrag,OLEDragDrop,OLEDragOver,OLEGiveFeedback,%
454        OLESetData,OLEStartDrag,OnAddNew,OnComm,Paint,PanelClick,%
455        PanelDblClick,PathChange,PatternChange,PlotActivated,%
456        PlotSelected,PlotUpdated,PointActivated,PointLabelActivated,%
457        PointLabelSelected,PointLabelUpdated,PointSelected,%
458        PointUpdated,PowerQuerySuspend,PowerResume,PowerStatusChanged,%
459        PowerSuspend,QueryChangeConfig,QueryComplete,QueryCompleted,%
460        QueryTimeout,QueryUnload,ReadProperties,Reposition,%
461        RequestChangeFileName,RequestWriteFile,Resize,ResultsChanged,%
462        RowColChange,RowCurrencyChange,RowResize,RowStatusChanged,%
463        SelChange,SelectionChanged,SendComplete,SendProgress,%
464        SeriesActivated,SeriesSelected,SeriesUpdated,SettingChanged,%
465        SplitChange,StateChanged,StatusUpdate,SysColorsChanged,%
466        Terminate,TimeChanged,TitleActivated,TitleSelected,%
467        TitleActivated,UnboundAddData,UnboundDeleteRow,%
468        UnboundGetRelativeBookmark,UnboundReadData,UnboundWriteData,%
469        Unload,UpClick,Updated,Validate,ValidationError,WillAssociate,%
470        WillChangeData,WillDissociate,WillExecute,WillUpdateRows,%
471        WithEvents,WriteProperties},% VB-events
472    morekeywords=[4]{AppActivate,Base,Beep,Call,Case,ChDir,ChDrive,%
473        Const,Declare,DefBool,DefByte,DefCur,DefDate,DefDbl,DefDec,%
474        DefInt,DefLng,DefObj,DefSng,DefStr,Deftype,DefVar,DeleteSetting,%
475        Dim,Do,Else,ElseIf,End,Enum,Erase,Event,Exit,Explicit,FileCopy,%
476        For,ForEach,Friend,Function,Get,GoSub,GoTo,If,Implements,Kill,%
```

```
477         Let,LineInput,Lock,Lset,MkDir,Name,Next,OnError,On,Option,%
478         Private,Property,Public,Put,RaiseEvent,Randomize,ReDim,Rem,%
479         Reset,Resume,Return,RmDir,Rset,SavePicture,SaveSetting,%
480         SendKeys,SetAttr,Static,Sub,Then,Type,Unlock,Wend,While,Width,%
481         With,Write},% statements
482     sensitive=false,%
483     keywordcomment=rem,%
484     MoreSelectCharTable=\def\lst@BeginKC@{% chmod
485         \lst@ResetToken
486         \lst@BeginComment\lst@GPmode{{\lst@commentstyle}%
487                       \lst@Lmodetrue\lst@modetrue}\@empty},%
488     morecomment=[l]{'},%
489     morecomment=[s]{/*}{*/},%
490     morestring=[b]",%
491     }[keywords,comments,strings,keywordcomments]
492 ⟨/lang1⟩
```

Thanks to Jonathan de Halleux for reporting a missing comma after `MoreSelectCharTable`, which was the cause of a problem reported by Robert Frank. Martina Hansel also found the bug and the fix.

2.9   Clean

Thanks to José Romildo Malaquias. Markus Pahlow found a missing comma.

```
493 ⟨*lang3⟩
494 %%
495 %% Clean definition (c) 1999 Jos\'e Romildo Malaquias
496 %%
497 %% Clean 1.3 :  some standard functional language: pure, lazy,
498 %%                polymorphic type system, modules, type classes,
499 %%                garbage collection, functions as first class citizens
500 %%
501 \lst@definelanguage{Clean}%
502   {otherkeywords={:,::,=,:==,=:,=>,->,<-,<-:,\{,\},\{|,|\},\#,\#!,|,\&,%
503       [,],!,.,\\\\,;,_},%
504    morekeywords={from,definition,implementation,import,module,system,%
505       case,code,if,in,let,let!,of,where,with,infix,infixl,infixr},%
506    morendkeywords={True,False,Start,Int,Real,Char,Bool,String,World,%
507       File,ProcId},%
508    sensitive,%
509    morecomment=[l]//,% missing comma: Markus Pahlow
510    morecomment=[n]{/*}{*/},%
511    morestring=[b]"%
512   }[keywords,comments,strings]
513 ⟨/lang3⟩
```

2.10   Corba IDL

This language definition is due to Jens T. Berger Thielemann.

514 ⟨∗lang2⟩
515 %%
516 %% Corba IDL definition (c) 1999 Jens T. Berger Thielemann
517 %%
518 \lst@definelanguage[CORBA]{IDL}%
519   {morekeywords={any,attribute,boolean,case,char,const,context,default,%
520   double,enum,exception,fixed,float,in,inout,interface,long,module,%
521   native,Object,octet,oneway,out,raises,readonly,sequence,short,%
522   string,struct,switch,typedef,union,unsigned,void,wchar,wstring,%
523   FALSE,TRUE},%
524   sensitive,%
525   moredirectives={define,elif,else,endif,error,if,ifdef,ifndef,line,%
526   include,pragma,undef,warning},%
527   moredelim=*[directive]\#,%
528   morecomment=[l]//,%
529   morecomment=[s]{/*}{*/},%
530   morestring=[b]"%
531   }[keywords,comments,strings,directives]%
532 ⟨/lang2⟩

2.11   C, C++, et al

533 ⟨∗lang1⟩

Michael Fiedler provided the following list of new introduced keywords for C++11.
534 \lst@definelanguage[11]{C++}[ISO]{C++}%
535   {morekeywords={alignas,alignof,char16_t,char32_t,constexpr,%
536   decltype,noexcept,nullptr,static_assert,thread_local},%
537   }%

Michael Piefel suggested some more changes and added GNU C++. For compatibility the 'ANSI' language is defined in terms of ISO.
538 \lst@definelanguage[ANSI]{C++}[ISO]{C++}{}%

Michael Piefel suggested some more changes and added GNU C++.
539 \lst@definelanguage[GNU]{C++}[ISO]{C++}%
540   {morekeywords={__attribute__,__extension__,__restrict,__restrict__,%
541   typeof,__typeof__},%
542   }%

543 \lst@definelanguage[Visual]{C++}[ISO]{C++}%
544   {morekeywords={__asm,__based,__cdecl,__declspec,dllexport,%
545   dllimport,__except,__fastcall,__finally,__inline,__int8,__int16,%
546   __int32,__int64,naked,__stdcall,thread,__try,__leave},%
547   }%

548 \lst@definelanguage[ISO]{C++}[ANSI]{C}%
549   {morekeywords={and,and_eq,asm,bad_cast,bad_typeid,bitand,bitor,bool,%
550   catch,class,compl,const_cast,delete,dynamic_cast,explicit,export,%
551   false,friend,inline,mutable,namespace,new,not,not_eq,operator,or,%
552   or_eq,private,protected,public,reinterpret_cast,static_cast,%
553   template,this,throw,true,try,typeid,type_info,typename,using,%
554   virtual,wchar_t,xor,xor_eq},%

16

```
555    }%
```

556 ⟨/lang1⟩

Objective-C is due to Detlev Dröge.

557 ⟨∗lang1⟩

```
558 %%
559 %% Objective-C definition (c) 1997 Detlev Droege
560 %%
561 \lst@definelanguage[Objective]{C}[ANSI]{C}
562   {morekeywords={bycopy,id,in,inout,oneway,out,self,super,%
563       @class,@defs,@encode,@end,@implementation,@interface,@private,%
564       @protected,@protocol,@public,@selector},%
565    moredirectives={import}%
566    }%
```

567 ⟨/lang1⟩

Jörg Viermann provided the keywords for Handel-C.

568 ⟨∗lang1⟩

```
569 %%
570 %% Handel-C definition, refer http://www.celoxica.com
571 %%
572 \lst@definelanguage[Handel]{C}[ANSI]{C}
573   {morekeywords={assert,chan,chanin,chanout,clock,delay,expr,external,%
574       external_divide,family,ifselect,in,inline,interface,internal,%
575       internal_divid,intwidth,let,macro,mpram,par,part,prialt,proc,ram,%
576       releasesema,reset,rom,select,sema,set,seq,shared,signal,try,%
577       reset,trysema,typeof,undefined,width,with,wom},%
578    }%
```

579 ⟨/lang1⟩

580 ⟨∗lang1⟩

```
581 \lst@definelanguage[ANSI]{C}%
582   {morekeywords={auto,break,case,char,const,continue,default,do,double,%
583       else,enum,extern,float,for,goto,if,int,long,register,return,%
584       short,signed,sizeof,static,struct,switch,typedef,union,unsigned,%
585       void,volatile,while},%
586    sensitive,%
587    morecomment=[s]{/*}{*/},%
588    morecomment=[l]//,% nonstandard
589    morestring=[b]",%
590    morestring=[b]',%
591    moredelim=*[directive]\#,%
592    moredirectives={define,elif,else,endif,error,if,ifdef,ifndef,line,%
593       include,pragma,undef,warning}%
594    }[keywords,comments,strings,directives]%
```

595 ⟨/lang1⟩

596 ⟨∗lang1⟩

Thanks go to Martin Brodbeck.

```
597 %%
598 %% C-Sharp definition (c) 2002 Martin Brodbeck
599 %%
600 \lst@definelanguage[Sharp]{C}%
601   {morekeywords={abstract,base,bool,break,byte,case,catch,char,checked,%
602       class,const,continue,decimal,default,delegate,do,double,else,%
603       enum,event,explicit,extern,false,finally,fixed,float,for,foreach,%
604       goto,if,implicit,in,int,interface,internal,is,lock,long,%
605       namespace,new,null,object,operator,out,override,params,private,%
606       protected,public,readonly,ref,return,sbyte,sealed,short,sizeof,%
607       static,string,struct,switch,this,throw,true,try,typeof,uint,%
608       ulong,unchecked,unsafe,ushort,using,virtual,void,while,%
609       as,volatile,stackalloc},% Kai K\"ohne
610     sensitive,%
611     morecomment=[s]{/*}{*/},%
612     morecomment=[l]//,%
613     morestring=[b]"
614   }[keywords,comments,strings]

615 ⟨/lang1⟩
```

2.12 Caml and Objective Caml

Patrick Cousot mailed me the definition. Tom Hirschowitz added two keywords.

```
616 ⟨*lang2⟩

617 %%
618 %% (Objective) Caml definition (c) 1999 Patrick Cousot
619 %%
620 %% Objective CAML and Caml light are freely available, together with a
621 %% reference manual, at URL ftp.inria.fr/lang/caml-light for the Unix,
622 %% Windows and Macintosh OS operating systems.
623 %%
624 \lst@definelanguage[Objective]{Caml}[light]{Caml}
625   {deletekeywords={not,prefix,value,where},%
626    morekeywords={assert,asr,class,closed,constraint,external,false,%
627       functor,include,inherit,land,lazy,lor,lsl,lsr,lxor,method,mod,%
628       module,new,open,parser,private,sig,struct,true,val,virtual,when,%
629       object,ref},% TH
630   }%

631 \lst@definelanguage[light]{Caml}
632   {morekeywords={and,as,begin,do,done,downto,else,end,exception,for,%
633       fun,function,if,in,let,match,mutable,not,of,or,prefix,rec,then,%
634       to,try,type,value,where,while,with},%
635    sensitive,%
636    morecomment=[n]{(*}{*)},%
637    morestring=[b]",%
638    moredelim=*[directive]\#,%
639    moredirectives={open,close,include}%
```

```
640    }[keywords,comments,strings,directives]%
```

641 ⟨/lang2⟩

2.13   Common Intermediate Language

This language definition for CIL (Common Intermediate Language, part of Microsoft's .NET interface) was provided by Olaf Conradi Akim Demaille pointed out that the support for Algol was broken, but that came from a long missing '@' in the following `lst@definelanguage`.

642 ⟨∗lang3⟩

```
643 \lst@definelanguage{CIL}{%
644   morekeywords=[1]{assembly, beforefieldinit, class, default, cdecl, cil,%
645     corflags, culture, custom, data, entrypoint, fastcall, field, file,%
646     hidebysig, hash, il, imagebase, locals, managed, marshall, maxstack,%
647     mresource, method, module, namespace, publickey, stdcall, subsystem,%
648     thiscall, unmanaged, vararg, ver, vtfixup,%
649     % types
650     bool, char, float32, float64, int, int8, int16, int32, int64, method,%
651     native, object, string, modopt, modreq, pinned, typedref, valuetype,%
652     unsigned, void,%
653     % defining types
654     abstract, ansi, auto, autochar, beforefieldinit, boxed, class,%
655     explicit, extends, implements, interface, famandassem, family,%
656     famorassem, inherits, nested, override, pack, private, property,%
657     public, rtspecialname, sealed, sequential, serializable, size,%
658     specialname, static, unicode,%
659     % postfix
660     algorithm, alignment, extern, init, from, nometadata, with},%
661   morekeywords=[2]{add, and, arglist, beq, bge, bgt, ble, blt, bne, br,%
662     break, brfalse, brtrue, call, calli, ceq, cgt, ckfinite, clt, conv,%
663     cpblk, div, dup, endfilter, endfinally, initblk, jmp, ldarg, ldarga,%
664     ldc, ldftn, ldind, ldloc, ldloca, ldnull, leave, localloc, mul, neg,%
665     nop, not, or, pop, rem, ret, shl, shr, starg, stind, stloc, sub,%
666     switch, xor,%
667     % prefix
668     tail, unaligned, volatile,%
669     % postfix
670     un, s, ovf,%
671     % object
672     box, callvirt, castclass, cpobj, cctor, ctor, initobj, isinst, ldelem,%
673     ldelema, ldfld, ldflda, ldlen, ldobj, ldsfld, ldsflda, ldstr, ldtoken,%
674     ldvirtftn, mkrefany, newarr, newobj, refanytype, refanyval, rethrow,%
675     sizeof, stelem, stfld, stobj, stsfld, throw, unbox},%
676   sensitive=true,%
677   morecomment=[l]{//},%
678   morestring=[b]"%
679 }[keywords,comments,strings]
```

680 ⟨/lang3⟩

2.14 Cobol

Keywords are not marked if their names are broken by EOL, for example DEBUG-CONTENTS. Sometimes portions of a string are not printed as a string. This happens if the double quote is not doubled to insert a quote, e.g. `""bad" cobol"` won't be printed correctly.

681 ⟨∗lang2⟩

```
682 \lst@definelanguage[ibm]{Cobol}[1985]{Cobol}%
683    {morekeywords={ADDRESS,BEGINNING,COMP-3,COMP-4,COMPUTATIONAL,%
684        COMPUTATIONAL-3,COMPUTATIONAL-4,DISPLAY-1,EGCS,EJECT,ENDING,%
685        ENTRY,GOBACK,ID,MORE-LABELS,NULL,NULLS,PASSWORD,RECORDING,%
686        RETURN-CODE,SERVICE,SKIP1,SKIP2,SKIP3,SORT-CONTROL,SORT-RETURN,%
687        SUPPRESS,TITLE,WHEN-COMPILED},%
688    }%
```

```
689 \lst@definelanguage[1985]{Cobol}[1974]{Cobol}%
690    {morekeywords={ALPHABET,ALPHABETIC-LOWER,ALPHABETIC-UPPER,%
691        ALPHANUMERIC,ALPHANUMERIC-EDITED,ANY,CLASS,COMMON,CONTENT,%
692        CONTINUE,DAY-OF-WEEK,END-ADD,END-CALL,END-COMPUTE,END-DELETE,%
693        END-DIVIDE,END-EVALUATE,END-IF,END-MULTIPLY,END-PERFORM,END-READ,%
694        END-RECEIVE,END-RETURN,END-REWRITE,END-SEARCH,END-START,%
695        END-STRING,END-SUBTRACT,END-UNSTRING,END-WRITE,EVALUATE,EXTERNAL,%
696        FALSE,GLOBAL,INITIALIZE,NUMERIC-EDITED,ORDER,OTHER,%
697        PACKED-DECIMAL,PADDING,PURGE,REFERENCE,RELOAD,REPLACE,STANDARD-1,%
698        STANDARD-2,TEST,THEN,TRUE},%
699    }%
```

```
700 \lst@definelanguage[1974]{Cobol}%
701    {morekeywords={ACCEPT,ACCESS,ADD,ADVANCING,AFTER,ALL,ALPHABETIC,ALSO,%
702        ALTER,ALTERNATE,AND,ARE,AREA,AREAS,ASCENDING,ASSIGN,AT,AUTHOR,%
703        BEFORE,BINARY,BLANK,BLOCK,BOTTOM,BY,CALL,CANCEL,CD,CF,CH,%
704        CHARACTER,CHARACTERS,CLOCK-UNITS,CLOSE,COBOL,CODE,CODE-SET,%
705        COLLATING,COLUMN,COMMA,COMMUNICATION,COMP,COMPUTE,CONFIGURATION,%
706        CONTAINS,CONTROL,CONTROLS,CONVERTING,COPY,CORR,CORRESPONDING,%
707        COUNT,CURRENCY,DATA,DATE,DATE-COMPILED,DATE-WRITTEN,DAY,DE,%
708        DEBUG-CONTENTS,DEGUB-ITEM,DEBUG-LINE,DEBUG-NAME,DEBUG-SUB1,%
709        DEBUG-SUB2,DEBUG-SUB3,DEBUGGING,DECIMAL-POINT,DECLARATIVES,%
710        DELETE,DELIMITED,DELIMITER,DEPENDING,DESCENDING,DESTINATION,%
711        DETAIL,DISABLE,DISPLAY,DIVIDE,DIVISION,DOWN,DUPLICATES,DYNAMIC,%
712        EGI,ELSE,EMI,ENABLE,END,END-OF-PAGE,ENTER,ENVIRONMENT,EOP,EQUAL,%
713        ERROR,ESI,EVERY,EXCEPTION,EXIT,EXTEND,FD,FILE,FILE-CONTROL,%
714        FILLER,FINAL,FIRST,FOOTING,FOR,FROM,GENERATE,GIVING,GO,GREATER,%
715        GROUP,HEADING,HIGH-VALUE,HIGH-VALUES,I-O,I-O-CONTROL,%
716        IDENTIFICATION,IF,IN,INDEX,INDEXED,INDICATE,INITIAL,INITIATE,%
717        INPUT,INPUT-OUTPUT,INSPECT,INSTALLATION,INTO,INVALID,IS,JUST,%
718        JUSTIFIED,KEY,LABEL,LAST,LEADING,LEFT,LENGTH,LESS,LIMIT,LIMITS,%
719        LINAGE,LINAGE-COUNTER,LINE,LINE-COUNTER,LINES,LINKAGE,LOCK,%
720        LOW-VALUE,LOW-VALUES,MEMORY,MERGE,MESSAGE,MODE,MODULES,MOVE,%
721        MULTIPLE,MULTIPLY,NATIVE,NEGATIVE,NEXT,NO,NOT,NUMBER,NUMERIC,%
722        OBJECT-COMPUTER,OCCURS,OF,OFF,OMITTED,ON,OPEN,OPTIONAL,OR,%
```

```
723        ORGANIZATION,OUTPUT,OVERFLOW,PAGE,PAGE-COUNTER,PERFORM,PF,PH,PIC,%
724        PICTURE,PLUS,POINTER,POSITION,PRINTING,POSITIVE,PRINTING,%
725        PROCEDURE,PROCEDURES,PROCEED,PROGRAM,PROGRAM-ID,QUEUE,QUOTE,%
726        QUOTES,RANDOM,RD,READ,RECEIVE,RECORD,RECORDING,RECORDS,REDEFINES,%
727        REEL,REFERENCES,RELATIVE,RELEASE,REMAINDER,REMOVAL,RENAMES,%
728        REPLACING,REPORT,REPORTING,REPORTS,RERUN,RESERVE,RESET,RETURN,%
729        REVERSED,REWIND,REWRITE,RF,RH,RIGHT,ROUNDED,RUN,SAME,SD,SEARCH,%
730        SECTION,SECURITY,SEGMENT,SEGMENT-LIMIT,SELECT,SEND,SENTENCE,%
731        SEPARATE,SEQUENCE,SEQUENTIAL,SET,SIGN,SIZE,SORT,SORT-MERGE,%
732        SOURCE,SOURCE-COMPUTER,SPACE,SPACES,SPECIAL-NAMES,STANDARD,START,%
733        STATUS,STOP,STRING,SUB-QUEUE-1,SUB-QUEUE-2,SUB-QUEUE-3,SUBTRACT,%
734        SUM,SYMBOLIC,SYNC,SYNCHRONIZED,TABLE,TALLYING,TAPE,TERMINAL,%
735        TERMINATE,TEXT,THAN,THROUGH,THRU,TIME,TIMES,TO,TOP,TRAILING,TYPE,%
736        UNIT,UNSTRING,UNTIL,UP,UPON,USAGE,USE,USING,VALUE,VALUES,VARYING,%
737        WHEN,WITH,WORDS,WORKING-STORAGE,WRITE,ZERO,ZEROES,ZEROS},%
738     alsodigit=-,%
739     sensitive=f,% ???
740     morecomment=[f][commentstyle][6]*,%
741     morestring=[d]"% ??? doubled
742   }[keywords,comments,strings]
```

commentstyle (not the surrounding brackets) have been added after a bug report
by Stephen Reindl.

```
743 ⟨/lang2⟩
```

2.15   Comal 80

The data is from

- BORGE R. CHRISTENSEN: **Strukturierte Programmierung mit CO-
  MAL 80** [aus dem Dänischen übertragen und bearbeitet von Margarete
  Kragh]; 2., verb. Auflage – München; Wien: Oldenburg, 1985; ISBN 3-486-
  26902-X.

```
744 ⟨∗lang3⟩
```

```
745 \lst@definelanguage{Comal 80}%
746   {morekeywords={AND,AUTO,CASE,DATA,DEL,DIM,DIV,DO,ELSE,ENDCASE,ENDIF,%
747       ENDPROC,ENDWHILE,EOD,EXEC,FALSE,FOR,GOTO,IF,INPUT,INT,LIST,LOAD,%
748       MOD,NEW,NEXT,NOT,OF,OR,PRINT,PROC,RANDOM,RENUM,REPEAT,RND,RUN,%
749       SAVE,SELECT,STOP,TAB,THEN,TRUE,UNTIL,WHILE,ZONE},%
750     sensitive=f,% ???
751     morecomment=[l]//,%
752     morestring=[d]"%
753   }[keywords,comments,strings]
```

```
754 ⟨/lang3⟩
```

2.16   COMMAND.COM Batch Files

This definition for DOS and Windows batch files is from Stephan Hennig.

```
755 ⟨*lang3⟩

756 \lst@definelanguage[WinXP]{command.com}%
757   {morekeywords={assoc,at,attrib,bootcfg,break,cacls,call,cd,chcp,chdir,%
758       chkdsk,chkntfs,cls,cmd,cmdextversion,color,comp,compact,convert,copy,%
759       date,defined,del,dir,diskcomp,diskcopy,do,doskey,echo,else,endlocal,%
760       erase,errorlevel,exist,exit,fc,find,findstr,for,format,ftype,goto,%
761       graftabl,help,if,in,label,md,mkdir,mode,more,move,not,off,path,%
762       pause,popd,print,prompt,pushd,rd,recover,ren,rename,replace,rmdir,%
763       set,setlocal,shift,sort,start,subst,time,title,tree,type,ver,%
764       verify,vol,xcopy},%
765   sensitive=false,%
766   alsoother={@},%
767   alsoletter={\%~:-/},%
768   morecomment=[l]{rem},%
769   morecomment=[l]{reM},%
770   morecomment=[l]{rEm},%
771   morecomment=[l]{rEM},%
772   morecomment=[l]{Rem},%
773   morecomment=[l]{ReM},%
774   morecomment=[l]{REm},%
775   morecomment=[l]{REM},%
776   morestring=[d]"%
777 }[keywords,comments,strings]

778 ⟨/lang3⟩
```

2.17 Comsol Multiphysics

Comsol Multiphysics (Prior to version 3.2 known as Femlab) can be used stand-alone or as an extension to MatLab. This definition is due to Martin Heller.

Unfortunately, there is a conflict in that Comsol is case-insensitive, whereas Matlab is case-sensitive; listings does not currently support different case-sensitivities in the same listing.

```
779 ⟨*lang3⟩

780 \lst@definelanguage{Comsol}%
781   {morekeywords={%
782       adaption,arc1,arc2,arrayr,assemble,asseminit,beziercurve2,block2,%
783       block3,bsplinecurve2,bsplinecurve3,bsplinesurf3,bypassplot,cardg,%
784       ccoeffgroup,chamfer,checkgeom,circ1,circ2,coeff2cell,comsol,%
785       cone2,cone3,Contents,createhexes,createprisms,createquads,csgbl2,%
786       csgbl3,csgcmpbz,csgimplbz,csginitaux,csginitnr,csgproputil,%
787       csgrbconv,csgunique3,csguniquep,csgversion,csgvvovl,curve2,%
788       curve3,cylinder2,cylinder3,dat2str,defastget,display,drawgetobj,%
789       drawreobj,drawsetobj,dst,duplicate,dxflayers,dxfread,dxfwrite,%
790       econe2,econe3,eigloop,elcconstr,elcplbnd,elcplextr,elcplproj,%
791       elcplscalar,elempty,elemreobj,eleqc,eleqw,elevate,elgeom,ellip1,%
792       ellip2,ellipsoid2,ellipsoid3,ellipsoidgen_fl23,elmat,elovar,%
793       elpconstr,elshape,elvar,elvarm,embed,extrude,face3,faceprim3,%
794       fastsetop,fem2jxfem,femblocksu,femdiff,femeig,femexport,femgui,%
```

```
795    femimport,femiter,femlab,femlin,femmesh,femmeshexp,femnlin,%
796    femplot,femsfun,femsim,femsimlowlevel,femsimserver,femsol,%
797    femsolver,femstate,femstruct,femtime,femwave,festyle,fieldnames,%
798    fillet,fl1d,fl2d,fl3d,flaction,flafun,flappconvert,flappobj,%
799    flaxisequal,flbase,flbinary,flc1hs,flc2hs,flcanpnt,flcell2draw,%
800    flclear,flcolorbar,flcompact,flconeplot,flcontour2mesh,%
801    flcontour2meshaux,flconvreact,flconvreact1d,flconvreact2d,%
802    flconvreact3d,flcyl,fldc1hs,fldc2hs,fldegree,fldegreer3,%
803    fldegreet3,fldimvarsget,fldisp,fldraw2cell,fldrawnow,fldsmhs,%
804    fldsmsign,flevalmat,flexch,flexchprop,flfastgeom,flform,flgc,%
805    flgcbo,flgdconv,flgeom2cellstr,flgeomadj,flgeomarcize,flgeomec,%
806    flgeomed,flgeomepol,flgeomes,flgeomfc,flgeomfd,flgeomfdp,%
807    flgeomff1,flgeomff2,flgeomfn,flgeomfs,flgeomgetlocalsys,%
808    flgeominit,flgeominitprop,flgeomitransform,flgeomloft,flgeommesh,%
809    flgeomnbs,flgeomnes,flgeomnmr,flgeomnv,flgeompsinv,flgeomrmsing,%
810    flgeomrotp,flgeomsd,flgeomsdim,flgeomse,flgeomsf2,flgeomspm,%
811    flgeomtransform,flgeomud,flgeomvtx,flgetdraw,flheat,flheat1d,%
812    flheat2d,flheat3d,flhelmholtz,flhelmholtz1d,flhelmholtz2d,%
813    flhelmholtz3d,flim2curve,flinterp1,fliscont,flismember,%
814    flisnumeric,fljaction,fllaplace,fllaplace1d,fllaplace2d,%
815    fllaplace3d,flload,flloadfl,flloadmatfile,flloadmfile,%
816    fllobj2cellstr,flmakeevalstr,flmapsoljac,flmat2str,flmatch,%
817    flmesh2spline,flmesh2splineaux,flml65setup,flngdof,flnull,%
818    flnullorth,flpde,flpdeac,flpdec,flpdec1d,flpdec2d,flpdec3d,%
819    flpdedc,flpdedc2d,flpdedc3d,flpdedf,flpdedf1d,flpdedf2d,%
820    flpdedf3d,flpdees,flpdees2d,flpdees3d,flpdeg,flpdeg1d,flpdeg2d,%
821    flpdeg3d,flpdeht,flpdeht1d,flpdeht2d,flpdeht3d,flpdems,flpdems2d,%
822    flpdems3d,flpdens,flpdens2d,flpdens3d,flpdepn,flpdeps,flpdesm3d,%
823    flpdew,flpdew1d,flpdew2d,flpdew3d,flpdewb,flpdewb1d,flpdewb2d,%
824    flpdewb3d,flpdewc,flpdewc1d,flpdewc2d,flpdewc3d,flpdewe,%
825    flpdewe3d,flpdewp,flpdewp2d,flpdewp3d,flplot,flpoisson,%
826    flpoisson1d,flpoisson2d,flpoisson3d,flpric2,flpric3,flreobj,%
827    flreport,flresolvepath,flsave,flschrodinger,flschrodinger1d,%
828    flschrodinger2d,flschrodinger3d,flsde,flsdp,flsdt,flsetalpha,%
829    flsetdraw,flsmhs,flsmsign,flspnull,fltherm_cond1,fltrg,flversion,%
830    flversions,flverver,flwave,flwave1d,flwave2d,flwave3d,%
831    flwriteghist,formstr,gdsread,gencyl2,gencyl3,genextrude,%
832    genextrudeaux,geom,geom0,geom0get,geom1,geom1get,geom2,geom2get,%
833    geom3,geom3get,geom3j2m,geom3m2j,geomaddlblmargin,geomanalyze,%
834    geomarrayr,geomassign,geomcoerce,geomcomp,geomconnect,geomcopy,%
835    geomcsg,geomdel,geomedit,geomexport,geomfile,geomget,%
836    geomgetlabels,geomgetwrkpln,geomimport,geominfo,geominfoaux,%
837    geomlblplot,geomload,geomnumparse,geomobject,geomparse,geomplot,%
838    geomplot1,geomplot2,geomplot3,geomposition,geomproputil,%
839    geomreconstruct,geomreobj,geomserver,geomspline,geomsurf,%
840    geomupdate,get,getfemgeom,getisocurve,getjptr,getmesh,getsdim,%
841    getvmatrixexch,handlesolnumstr,helix1,helix2,helix3,hexahedron2,%
842    hexahedron3,histfrommat,idst,igesread,importplotdata,isempty,%
843    isfield,isfunc,isscript,javaclass,jproputil,jptr2geom,jptrgeom1,%
844    jptrgeom1_fl23,jptrgeom2,jptrgeom2_fl23,jptrgeom3,jptrgeom3_fl23,%
```

```
845        keiter,line1,line2,loadobj,loft,matlabinterpdata,mesh2geom,%
846        meshassign,meshcaseadd,meshcasedel,meshcaseutil,meshcheck,%
847        meshembed,meshenrich,meshenrich1,meshenrich2,meshenrich3,%
848        meshexport,meshextend,meshextrude,meshget,meshimport,meshinit,%
849        meshintegrate,meshmap,meshoptim,meshparse,meshplot,meshplot1,%
850        meshplot2,meshplot3,meshplotproputil,meshpoi,meshproputil,%
851        meshptplot,meshqual,meshrefine,meshrevolve,meshsmooth,%
852        meshsmooth2,meshsweep,meshvolume,minus,mirror,mkreflparams,%
853        mmsolve,modetype,move,moveglobalfields,mphproputil,mtimes,%
854        multiphysics,mypostinterp,notscript,onlyelsconstr,outassign,%
855        paramgeom,pde2draw,pde2equ,pde2fem,pde2geom,pdeblxpd,plus,point1,%
856        point2,point3,poisson,poly1,poly2,postanim,postapplysettings,%
857        postarrow,postarrowbnd,postcolorbar,postcont,postcontdomind,%
858        postcoord,postcopyprop,postcrossplot,postdistrprops,posteval,%
859        postflow,postfnd,postgeomplot,postgetfem,postgetstylecolor,%
860        postglobaleval,postglobalplot,postgp,postinit,postint,postinterp,%
861        postiso,postlin,postmakecontcol,postmax,postmaxmin,postmin,%
862        postmkcontbar,postmknormexpr,postmovie,postnewplot,%
863        postoldmaxminprops,postpd2pm,postplot,postplotconstants,%
864        postpm2pd,postprinc,postprincbnd,postprocgui,postproputil,%
865        postslice,postsurf,posttet,posttitle,print2file,pyramid2,%
866        pyramid3,rect1,rect2,restorefields,revolve,rmfield,rotate,%
867        rotmatrix,scale,serialize,set,setmesh,sh2str,sharg_2_5,shbub,%
868        shdisc,shdiv,shherm,shlag,shvec,simplecoerce,simreobj,slblocks,%
869        solassign,solid0,solid1,solid2,solid3,solidprim3,solproputil,%
870        solsize,solveraddcases,sphere2,sphere3,spiceimport,splineaux,%
871        split,splittoprim,square1,square2,stlread,submode,submodes,%
872        subsasgn,subsref,tangent,taucs,tetrahedron2,tetrahedron3,%
873        tobsplines,torus2,torus3,transform,update,updateassoc,%
874        updateassocinfo,updatefem,updateguistruct,updateobj,vrmlread,%
875        xmeshinfo,xmeshinit},%
876     sensitive=false,%
877     morecomment=[l]\%,%
878     morestring=[m]'%
879   }[keywords,comments,strings]

880 ⟨/lang3⟩
```

2.18   bash, csh, and sh

csh is from Kai Below, but he pointed out that some keywords are probably missing.

```
881 ⟨*lang1⟩

882 %%
883 %% csh definition (c) 1998 Kai Below
884 %%
885 \lst@definelanguage{csh}
886   {morekeywords={alias,awk,cat,echo,else,end,endif,endsw,exec,exit,%
887        foreach,glob,goto,history,if,logout,nice,nohup,onintr,repeat,sed,%
```

```
888        set,setenv,shift,source,switch,then,time,while,umask,unalias,%
889        unset,wait,while,@,env,argv,child,home,ignoreeof,noclobber,%
890        noglob,nomatch,path,prompt,shell,status,verbose,print,printf,%
891        sqrt,BEGIN,END},%
892    morecomment=[l]\#,%
893    morestring=[d]"%
894    }[keywords,comments,strings]
```

Thanks to Riccardo Murri for the following two definitions. Scott Pakin pointed out some missing keywords (`elif`, `in` for `sh`, `caller`, `compopt`, `coproc`, `dirs`, `help`, `mapfile`, `readarray` for `bash`) to the current maintainer. The `sh` list of keywords was checkead against the "Manual of the Bourne Shell on Version 7", found at http://www.in-ulm.de/~mascheck/bourne/v7/, last visited on 2014/09/06. Ralf Schandl indicated the missing of an apostrophe as delimiter of strings.

```
895 %%
896 %% bash,sh definition (c) 2003 Riccardo Murri <riccardo.murri@gmx.it>
897 %%
898 \lst@definelanguage{bash}[]{sh}%
899    {morekeywords={alias,bg,bind,builtin,caller,command,compgen,compopt,%
900        complete,coproc,declare,disown,dirs,enable,fc,fg,help,history,%
901        jobs,let,local,logout,mapfile,printf,pushd,popd,readarray,select,%
902        set,suspend,shopt,source,times,type,typeset,ulimit,unalias,wait},%
903    }%
904 \lst@definelanguage{sh}%
905    {morekeywords={awk,break,case,cat,cd,continue,do,done,echo,elif,else,%
906        env,esac,eval,exec,exit,export,expr,false,fi,for,function,getopts,%
907        hash,history,if,in,kill,login,newgrp,nice,nohup,ps,pwd,read,%
908        readonly,return,set,sed,shift,test,then,times,trap,true,type,%
909        ulimit,umask,unset,until,wait,while},%
910    morecomment=[l]\#,%
911    morestring=[d]",%
912    morestring=[d]'%
913    }[keywords,comments,strings]
914 ⟨/lang1⟩
```

Jobst Hoffmann copied the definition of a style for printing Fortran code to a style for printing shell programs:

```
915 ⟨∗bash-prf⟩
916 \usepackage[rgb, x11names]{xcolor}
917
918 % common settings
919 \lstset{%
920    frame=tlb,%        the frame is open on the right side
921    resetmargins=false,%
922    rulesepcolor=\color{black},%
923    numbers=left,%              % left
924    numberstyle=\tiny,%
925    numbersep=5pt,%
926    firstnumber=1,%
```

```
927   stepnumber=5,%
928   columns=fixed,%                    % to prevent inserting spaces
929   fontadjust=true,%
930   keepspaces=true,%
931   basewidth=0.5em,%
932   captionpos=t,%
933   abovecaptionskip=\smallskipamount,% same amount as default
934   belowcaptionskip=\smallskipamount,% in caption package
935 }
936 % settings for colored printing
937 \lstdefinestyle{bash}{%
938   backgroundcolor=\color{yellow!10},%
939   basicstyle=\small\ttfamily,%
940   identifierstyle=\color{black},%
941   keywordstyle=\color{blue},%
942   keywordstyle={[2]\color{cyan}},%
943   keywordstyle={[3]\color{olive}},%
944   stringstyle=\color{teal},%
945   commentstyle=\itshape\color{orange},%
946 }%
947 % settings for back and white printing
948 \lstdefinestyle{bashbw}{%
949   backgroundcolor={},%
950   basicstyle=\small\ttfamily,%
951   identifierstyle={},%
952   keywordstyle=\bfseries,%
953   stringstyle=\itshape,%
954   commentstyle=\slshape,%
955   rulesepcolor=\color{black},%
956 }%
```

This code is provided in the file `listings-bash.prf`, see section 2.4.1 (Preferences) of the listings documentation.

```
957 ⟨/bash-prf⟩
```

2.19   Delphi

I took the data from Delphi 1.0 (?) online help. Christian Gudrian provided the 'double slash' comment.

```
958 ⟨∗lang2⟩
```

```
959 \lst@definelanguage{Delphi}%
960   {morekeywords={and,as,asm,array,begin,case,class,const,constructor,%
961       destructor,div,do,downto,else,end,except,exports,file,finally,%
962       for,function,goto,if,implementation,in,inherited,inline,%
963       initialization,interface,is,label,library,mod,nil,not,object,of,%
964       or,packed,procedure,program,property,raise,record,repeat,set,%
965       shl,shr,string,then,to,try,type,unit,until,uses,var,while,with,%
966       xor,%
967       absolute,abstract,assembler,at,cdecl,default,dynamic,export,%
```

```
968        external,far,forward,index,name,near,nodefault,on,override,%
969        private,protected,public,published,read,resident,storedDir,%
970        virtual,write},%
971    morendkeywords={Abs,AddExitProc,Addr,AllocMem,AnsiCompareStr,%
972        AnsiCompareText,AnsiLowerCase,AnsiUpperCase,Append,AppendStr,%
973        ArcTan,AssignCrt,Assigned,AssignFile,BlockRead,BlockWrite,Break,%
974        ChangeFileExt,ChDir,Chr,CloseFile,ClrEol,ClrScr,Concat,Continue,%
975        Copy,Cos,CSeg,CursorTo,Date,DateTimeToFileDate,DateTimeToStr,%
976        DateTimeToString,DateToStr,DayOfWeek,Dec,DecodeDate,DecodeTime,%
977        Delete,DeleteFile,DiskFree,DiskSize,Dispose,DisposeStr,%
978        DoneWinCrt,DSeg,EncodeDate,EncodeTime,Eof,Eoln,Erase,Exclude,%
979        Exit,Exp,ExpandFileName,ExtractFileExt,ExtractFileName,%
980        ExtractFilePath,FileAge,FileClose,FileDateToDateTime,FileExists,%
981        FileGetAttr,FileGetDate,FileOpen,FilePos,FileRead,FileSearch,%
982        FileSeek,FileSetAttr,FileSetDate,FileSize,FillChar,FindClose,%
983        FindFirst,FindNext,FloatToDecimal,FloatToStrF,FloatToStr,%
984        FloatToText,FloatToTextFmt,Flush,FmtLoadStr,FmtStr,Format,%
985        FormatBuf,FormatDateTime,FormatFloat,Frac,Free,FreeMem,GetDir,%
986        GetMem,GotoXY,Halt,Hi,High,Inc,Include,InitWinCrt,Insert,Int,%
987        IntToHex,IntToStr,IOResult,IsValidIdent,KeyPressed,Length,Ln,Lo,%
988        LoadStr,Low,LowerCase,MaxAvail,MemAvail,MkDir,Move,New,NewStr,%
989        Now,Odd,Ofs,Ord,ParamCount,ParamStr,Pi,Pos,Pred,Ptr,Random,%
990        Randomize,Read,ReadBuf,ReadKey,Readln,ReAllocMem,Rename,%
991        RenameFile,Reset,Rewrite,RmDir,Round,RunError,ScrollTo,Seek,%
992        SeekEof,SeekEoln,Seg,SetTextBuf,Sin,SizeOf,SPtr,Sqr,Sqrt,SSeg,%
993        Str,StrCat,StrComp,StrCopy,StrDispose,StrECopy,StrEnd,StrFmt,%
994        StrLCat,StrIComp,StrLComp,StrLCopy,StrLen,StrLFmt,StrLIComp,%
995        StrLower,StrMove,StrNew,StrPas,StrPCopy,StrPos,StrScan,StrRScan,%
996        StrToDate,StrToDateTime,StrToFloat,StrToInt,StrToIntDef,%
997        StrToTime,StrUpper,Succ,Swap,TextToFloat,Time,TimeToStr,%
998        TrackCursor,Trunc,Truncate,TypeOf,UpCase,UpperCase,Val,WhereX,%
999        WhereY,Write,WriteBuf,WriteChar,Writeln},%
1000   sensitive=f,%
1001   morecomment=[s]{(*}{*)},%
1002   morecomment=[s]{\{}{\}},%
1003   morecomment=[l]{//},% 2001 Christian Gudrian
1004   morestring=[d]'%
1005   }[keywords,comments,strings]
1006 ⟨/lang2⟩
```

2.20   Eiffel

Data is from

- BERTRAND MEYER: **Eiffel: the language**; Prentice Hall International
  (UK) Ldt, 1992; ISBN 0-13-247925-7.

```
1007 ⟨∗lang2⟩

1008 \lst@definelanguage{Eiffel}%
```

```
1009    {morekeywords={alias,all,and,as,BIT,BOOLEAN,CHARACTER,check,class,%
1010        creation,Current,debug,deferred,do,DOUBLE,else,elseif,end,%
1011        ensure,expanded,export,external,false,feature,from,frozen,if,%
1012        implies,indexing,infix,inherit,inspect,INTEGER,invariant,is,%
1013        like,local,loop,NONE,not,obsolete,old,once,or,POINTER,prefix,%
1014        REAL,redefine,rename,require,rescue,Result,retry,select,%
1015        separate,STRING,strip,then,true,undefine,unique,until,variant,%
1016        when,xor},%
1017      sensitive,%
1018      morecomment=[l]--,%
1019      morestring=[d]",%
1020    }[keywords,comments,strings]
```

The key=value `stringtest=false` has been removed after a bug report from Xavier Crégut.

```
1021 ⟨/lang2⟩
```

2.21 Elan

The data come from

- Leo H. Klingen, Jochen Liedtke: **Programmieren mit ELAN**; B.G. Teubner, Stuttgart 1983; ISBN 3-519-02507-8.

```
1022 ⟨*lang3⟩
```

```
1023 \lst@definelanguage{Elan}%
1024    {morekeywords={ABS,AND,BOOL,CAND,CASE,CAT,COLUMNS,CONCR,CONJ,CONST,%
1025        COR,DECR,DEFINES,DET,DIV,DOWNTO,ELIF,ELSE,END,ENDIF,ENDOP,%
1026        ENDPACKET,ENDPROC,ENDREP,ENDSELECT,FALSE,FI,FILE,FOR,FROM,IF,%
1027        INCR,INT,INV,LEAVE,LENGTH,LET,MOD,NOT,OF,OP,OR,OTHERWISE,PACKET,%
1028        PROC,REAL,REP,REPEAT,ROW,ROWS,SELECT,SIGN,STRUCT,SUB,TEXT,THEN,%
1029        TRANSP,TRUE,TYPE,UNTIL,UPTO,VAR,WHILE,WITH,XOR,%
1030        maxint,sign,abs,min,max,random,initializerandom,subtext,code,%
1031        replace,text,laenge,pos,compress,change,maxreal,smallreal,floor,%
1032        pi,e,ln,log2,log10,sqrt,exp,tan,tand,sin,sind,cos,cosd,arctan,%
1033        arctand,int,real,lastconversionok,put,putline,line,page,get,%
1034        getline,input,output,sequentialfile,maxlinelaenge,reset,eof,%
1035        close,complexzero,complexone,complexi,complex,realpart,imagpart,%
1036        dphi,phi,vector,norm,replace,matrix,idn,row,column,sub,%
1037        replacerow,replacecolumn,replaceelement,transp,errorsstop,stop},%
1038      sensitive,%
1039      morestring=[d]"%
1040    }[keywords,strings]
```

```
1041 ⟨/lang3⟩
```

2.22 Erlang

Thanks to Daniel Gazard.

```
1042 ⟨*lang3⟩
```

```
1043 %%
1044 %% Erlang definition (c) 2003 Daniel Gazard
1045 %%
1046 \lst@definelanguage{erlang}%
1047   {morekeywords={abs,after,and,apply,atom,atom_to_list,band,binary,%
1048       binary_to_list,binary_to_term,bor,bsl,bsr,bxor,case,catch,%
1049       date,div,element,erase,end,exit,export,float,float_to_list,%
1050       get,halt,hash,hd,if,info,import,integer,integer_to_list,%
1051       length,link,list,list_to_atom,list_to_float,list_to_integer,%
1052       list_to_tuple,module,node,nodes,now,of,or,pid,port,ports,%
1053       processes,put,receive,reference,register,registered,rem,%
1054       round,self,setelement,size,spawn,throw,time,tl,trace,trunc,%
1055       tuple,tuple_to_list,unlink,unregister,whereis,error,false,%
1056       infinity,nil,ok,true,undefined,when},%
1057     otherkeywords={->,!,[,],\{,\}},%
1058     morecomment=[l]\%,%
1059     morestring=[b]",%
1060     morestring=[b]'%
1061   }[keywords,comments,strings]

1062 ⟨/lang3⟩
```

2.23   Euphoria

Detlef Reimers sent me the language definition.

```
1063 ⟨*lang2⟩

1064 %%
1065 %% Euphoria definition (c) 1998 Detlef Reimers
1066 %%
1067 \lst@definelanguage{Euphoria}%
1068 % for Euphoria 2.0, Rapid Deployment Software, Kanada
1069   {morekeywords={abort,and,and_bits,append,arctan,atom,by,call,%
1070       call_proc,call_func,c_proc,c_func,clear_screen,close,%
1071       command_line,compare,constant,cos,do,date,else,elsif,end,exit,%
1072       find,floor,for,function,getc,getenv,get_key,gets,global,%
1073       get_pixel,if,include,integer,length,log,match,machine_func,%
1074       machine_proc,mem_copy,mem_set,not,not_bits,or,object,open,%
1075       or_bits,procedure,puts,position,prepend,print,printf,power,peek,%
1076       poke,pixel,poke4,peek4s,peek4u,return,rand,repeat,remainder,%
1077       routine_id,sequence,sqrt,sin,system,sprintf,then,type,to,time,%
1078       trace,tan,while,with,without,xor,xor_bits},%
1079     sensitive,%
1080     morecomment=[l]--,%
1081     morestring=[d]',%
1082     morestring=[d]"%
1083   }[keywords,comments,strings]

1084 ⟨/lang2⟩
```

2.24 Fortran

Took things from

- KARL HANS MÜLLER: **Fortran 77: Programmierungsanleitung**; 3., völlig neu bearb. Aufl. – Mannheim; Wien; Zürich: Bibliographisches Institut, 1984; ISBN 3-411-05804-8

- THOMAS MICHEL: **Fortran 90: Lehr– und Handbuch**; Mannheim; Leipzig; Wien; Zürich: BI-Wiss.-Verlag, 1994; ISBN 3-411-16861-7.

Another source for Fortran keywords is http://fortranwiki.org/fortran/show/Keywords where the keywords for Fortran 2003 and 2008 are taken from.

1085 ⟨∗lang1⟩

The current version of Fortran (Fortran 2018) is defined by ISO/IEC 1539-1:2018, for a deeper insight have a look at https://wg5-fortran.org/f2018.html. It contains ? new keywords, ? of them consisting of two words: `FAIL IMAGE`, so the list of keywords contains the single parts `FAIL` and `IMAGE`. So there is the following definition of Fortran 2018 keywords

```
1086 \lst@definelanguage[18]{Fortran}[08]{Fortran}{%
1087    morekeywords={FAIL, IMAGE, NON_RECURSIVE},%
```

and procedures:

```
1088    morekeywords=[3]{GET_TEAM, TEAM_NUMBER, IMAGE_TEAMS, NUM_IMAGES,
1089      THIS_IMAGE, FAILED_IMAGES, STOPPED_IMAGES, IMAGES_STATUS, CO_BROADCAST,
1090    CO_MAX, CO_MIN, CO_SUM, CO_REDUCE, ATOMIC_ADD, ATOMIC_AND, ATOMIC_OR,
1091    ATOMIC_XOR, ATOMIC_FETCH_ADD, ATOMIC_FETCH_AND, ATOMIC_FETCH_OR,
1092    ATOMIC_FETCH_XOR, ATOMIC_FETCH_CAS, IEEE_GET_MODES, IEEE_SET_MODES,
1093    IEEE_FMA, IEEE_SIGNBIT, IEEE_INT, IEEE_REM, IEEE_MAX_NUM,
1094    IEEE_MAX_NUM_MAG,
1095    IEEE_MIN_NUM, IEEE_MAX_NUM_MAG, IEEE_NEXT_DOWN, IEEE_NEXT_UP,
1096    IEEE_SUPPORT_DATATYPE, IEEE_QUIET_EQ, IEEE_QUIET_GE, IEEE_QUIET_GT,
1097    IEEE_QUIET_LE, IEEE_QUIET_LT, IEEE_QUIET_NE, IEEE_SIGNALING_EQ,
1098    IEEE_SIGNALING_GE, IEEE_SIGNALING_GT, IEEE_SIGNALING_LE,
1099    IEEE_SIGNALING_LT, IEEE_SIGNALING_NE}%
1100 }%
```

The Fortran 2008 version is defined by ISO/IEC 1539-1:2010. It contains nine new keywords, four of them consisting of two words: `ERROR STOP`, `SYNC ALL`, `SYNC IMAGES`, `SYNC MEMORY`, so the list of keywords contains the single parts `ALL`, `ERROR`, `IMAGES`, `MEMORY`, and `SYNC`.

```
1101 \lst@definelanguage[08]{Fortran}[03]{Fortran}{%
1102   morekeywords={ALL, BLOCK, CODIMENSION, CONCURRENT, CONTIGUOUS, CRITICAL,%
1103     ERROR, IMAGES, LOCK, MEMORY, SUBMODULE, SYNC, UNLOCK},%
```

New procedures in Fortran 2008:

```
1104   morekeywords=[3]{ACOSH, ASINH, ATANH, ATOMIC_DEFINE, ATOMIC_REF,%
1105     BESSEL_J0, BESSEL_J1, BESSEL_JN, BESSEL_Y0, BESSEL_Y1, BESSEL_YN,%
1106     BGE, BGT, BLE, BLT, C_SIZEOF, COMPILER_OPTIONS, COMPILER_VERSION,%
1107     DSHIFTL, DSHIFTR, ERF, ERFC, ERFC_SCALED, EXECUTE_COMMAND_LINE,%
```

```
1108    FINDLOC, GAMMA, HYPOT, IALL, IANY, IMAGE_INDEX, IPARITY, LCOBOUND,%
1109    LEADZ, LOG_GAMMA, MASKL, MASKR, MERGE_BITS, NORM2, NUM_IMAGES,%
1110    PARITY, POPCNT, POPPAR, SHIFTA, SHIFTL, SHIFTR, STORAGE_SIZE,%
1111    THIS_IMAGE, TRAILZ, UCOBOUND}%
1112 }%
```

Fortran 2003 introduces the following keywords:

```
1113 \lst@definelanguage[03]{Fortran}[95]{Fortran}{%
1114   morekeywords={ABSTRACT, ASSOCIATE, ASYNCHRONOUS, BIND, CLASS, DEFERRED,%
1115     ENUM, ENUMERATOR, EXTENDS, FINAL, FLUSH, GENERIC, IMPORT,%
1116     NON_OVERRIDABLE, NOPASS, PASS, PROTECTED, VALUE, VOLATILE, WAIT},%
```

These are new options/specifiers:

```
1117     morekeywords=[2]{DECIMAL, ENCODING, IOMSG, ROUND},%
```

And also some new procedures:

```
1118   morekeywords=[3]{C_ASSOCIATED, C_F_POINTER, C_F_PROCPOINTER, C_FUNLOC,%
1119     C_LOC, COMMAND_ARGUMENT_COUNT, EXTENDS_TYPE_OF, GET_COMMAND,%
1120     GET_COMMAND_ARGUMENT, GET_ENVIRONMENT_VARIABLE, IS_IOSTAT_END,%
1121     MOVE_ALLOC,NEW_LINE,SAME_TYPE_AS, SELECTED_CHAR_KIND}%
1122 }%
```

Denis Girou proposed to have Fortran 95 and Fortran 90 to be equivalent.

```
1123 \lst@definelanguage[90]{Fortran}[95]{Fortran}{}
```

There is no `morecomment=[f]` in Fortran 90 since otherwise `CONTAINS` could start a comment. This problem was reported by Magne Rudshaug. Moreover the keyword `INCLUDE` is due to him.

```
1124 \lst@definelanguage[95]{Fortran}[77]{Fortran}{%
1125   deletekeywords=SAVE,%
1126   morekeywords={ALLOCATABLE, ALLOCATE, ASSIGNMENT, CASE, CONTAINS, CYCLE,%
1127     DEALLOCATE, DEFAULT, EXIT, INCLUDE, IN, NONE, OUT, INTENT, INTERFACE,%
1128     MODULE, NAMELIST, NULLIFY, ONLY, OPERATOR, OPTIONAL, OUT, POINTER,%
1129     PRIVATE, PUBLIC, RECURSIVE, RESULT, SELECT, SEQUENCE, TARGET, TYPE,%
1130     USE, WHERE, WHILE, BLOCKDATA, DOUBLEPRECISION, ENDBLOCKDATA, ENDFILE,%
1131     ENDFUNCTION, ENDINTERFACE, ENDMODULE, ENDPROGRAM, ENDSELECT,%
1132     ENDSUBROUTINE, ENDTYPE, ENDWHERE, INOUT, SELECTCASE,%
```

Theses keys were missing from the 1.4 version of listings:

```
1133     ELEMENTAL, ELSEWHERE, FORALL, PURE,%
```

This is another key missing from the 1.4 version of listings:

```
1134       PROCEDURE},%
```

The list of option keywords/specifiers new in Fortran 90 and 95:

```
1135   morekeywords=[2]{ACTION, ADVANCE, DELIM, IOLENGTH, LEN, NAME, NML, PAD,%
1136     POSITION, READWRITE, SIZE, STAT},% corrected NML from NMT
```

and the list of intrinsic procedures new in Fortran 90 and 95:

```
1137   morekeywords=[3]{ACHAR, ADJUSTL, ADJUSTR, ALL, ALLOCATED, ANY, ASSOCIATED,%
1138     BIT_SIZE, BTEST, CEILING, COUNT, CPU_TIME, CSHIFT, DATE_AND_TIME, DIGITS,%
1139     DOT_PRODUCT, EOSHIFT, EPSILON, EXPONENT, FLOOR, FRACTION, HUGE, IACHAR,%
1140     IAND, IBCLR, IBITS, IBSET, ICHAR, IEOR, IOR, ISHFT, ISHFTC, KIND, LBOUND,%
```

31

```
1141     LEN_TRIM,% left out LOGICAL
1142     MATMUL, MAXEXPONENT, MAXLOC, MAXVAL, MERGE, MINEXPONENT, MINLOC, MINVAL,%
1143     MODULO, MVBITS, NEAREST, NOT, NULL, PACK, PRECISION, PRESENT, PRODUCT,%
1144     RADIX, RANDOM_NUMBER, RANDOM_SEED, RANGE, RANK, REPEAT, RESHAPE,%
1145     RRSPACING, SCALE, SCAN, SELECTED_INT_KIND, SELECTED_REAL_KIND,%
1146     SET_EXPONENT, SHAPE, SINH, SIZE, SPACING, SPREAD, SUM, SYSTEM_CLOCK,%
1147     TINY, TRANSFER, TRANSPOSE, TRIM, UBOUND, UNPACK, VERIFY},%
1148   deletecomment=[f],% no fixed comment line: 1998 Magne Rudshaug
1149 morecomment=[l]!%
1150 }%
```

As proposed by Jörn Wilms keywords are *not* case sensitive. Also, note that Fortran 77 (and fixed-format source in later versions) allows space in keywords; thus, this list contains some of the more common variants (e.g., 'GO TO' and 'GOTO').

```
1151 \lst@definelanguage[77]{Fortran}{%
```

Jobst Hoffmann divided the list of keywords into two lists. The first list contains the statement keywords, the second list contains the option keywords/specifiers and values. This makes the different meanings of the keywords distinguishable.

```
1152   morekeywords={ASSIGN, BACKSPACE, CALL, CHARACTER, %
1153     CLOSE, COMMON, COMPLEX, CONTINUE, DATA, DIMENSION, DO, DOUBLE, %
1154     ELSE, ELSEIF, END, ENDIF, ENDDO, ENTRY, EQUIVALENCE, EXTERNAL, %
1155     FILE, FORMAT, FUNCTION, GO, TO, GOTO, IF, IMPLICIT, %
1156     INQUIRE, INTEGER, INTRINSIC, LOGICAL, %
1157     OPEN, PARAMETER, PAUSE, PRECISION, PRINT, PROGRAM, READ, REAL, %
1158     RETURN, REWIND, SAVE, STOP, SUBROUTINE, THEN, %
1159     WRITE},%
1160   morekeywords=[2]{ACCESS, BLANK, BLOCK, DIRECT, EOF, ERR, EXIST,%
1161     FMT, FORM, FORMATTED, IOSTAT, NAMED, NEXTREC, NUMBER, OPENED,%
1162     REC, RECL, SEQUENTIAL, STATUS, TYPE, UNFORMATTED, UNIT},%
```

And here is another list: the list of intrinsic procedures (remember: all functions belong to the Fortran language specification!)

```
1163   morekeywords=[3]{INT, DBLE, CMPLX, ICHAR, CHAR, AINT, ANINT,% left out real
1164     NINT, ABS, MOD, SIGN, DIM, DPROD, MAX, MIN, AIMAG, CONJG, SQRT,%
1165     EXP, LOG, LOG10, SIN, COS, TAN, ASIN, ACOS, ATAN, ATAN2, SINH,%
1166     COSH, TANH, LGE, LGT, LLE, LLT, LEN, INDEX},%
```

And here is the last list: fortran operators:

```
1167   morekeywords=[4]{AND, EQ, EQV, FALSE, GE, GT, OR, LE, LT, NE, NEQV,%
1168     NOT, TRUE},%
1169   sensitive=f,%% not Fortran-77 standard, but allowed in Fortran-95 %%
1170   morecomment=[f]*,%
1171   morecomment=[f]C,%
1172   morecomment=[f]c,%
1173   morestring=[d]",%% not Fortran-77 standard, but allowed in Fortran-95 %%
1174   morestring=[d]'%
1175   }[keywords,comments,strings]
```

```
1176 ⟨/lang1⟩
```

Jobst Hoffmann supplied a definition of a style for printing Fortran code:

```
1177 ⟨*fortran-prf⟩

1178 \usepackage[rgb, x11names]{xcolor}
1179
1180 % common settings
1181 \lstset{%
1182   frame=tlb,%        the frame is open on the right side
1183   resetmargins=false,%
1184   rulesepcolor=\color{black},%
1185   numbers=left,%                  % left
1186   numberstyle=\tiny,%
1187   numbersep=5pt,%
1188   firstnumber=1,%
1189   stepnumber=5,%
1190   columns=fixed,%                 % to prevent inserting spaces
1191   fontadjust=true,%
1192   keepspaces=true,%
1193   basewidth=0.5em,%
1194   captionpos=t,%
1195   abovecaptionskip=\smallskipamount,% same amount as default
1196   belowcaptionskip=\smallskipamount,% in caption package
1197 }
1198 % settings for colored printing
1199 \lstdefinestyle{fortran}{%
1200   backgroundcolor=\color{yellow!10},%
1201   basicstyle=\small\ttfamily,%
1202   identifierstyle=\color{black},%
1203   keywordstyle=\color{blue},%
1204   keywordstyle={[2]\color{cyan}},%
1205   keywordstyle={[3]\color{olive}},%
1206   stringstyle=\color{teal},%
1207   commentstyle=\itshape\color{orange},%
1208 }%
1209 % settings for back and white printing
1210 \lstdefinestyle{fortranbw}{%
1211   backgroundcolor={},%
1212   basicstyle=\small\ttfamily,%
1213   identifierstyle={},%
1214   keywordstyle=\bfseries,%
1215   stringstyle=\itshape,%
1216   commentstyle=\slshape,%
1217   rulesepcolor=\color{black},%
1218 }%
```

This code is provided in the file `listings-fortran.prf`, see section 2.4.1 (Preferences) of the listings documentation.

```
1219 ⟨/fortran-prf⟩
```

2.25 GAP—Groups, Algorithms, Programming

GAP is a System for Computational Discrete Algebra, a description can be found at http://www.gap-system.org/. Heiko Oberdiek provided a language definition without knowing this language, so any error should be announced to the current maintainer of the listings package.

1220 ⟨∗lang2⟩

```
1221 %%
1222 %% GAP definition
1223 %% (c) 2013 Heiko Oberdiek
1224 %%
1225 \lst@definelanguage{GAP}{%
1226   morekeywords={%
1227     Assert,Info,IsBound,QUIT,%
1228     TryNextMethod,Unbind,and,break,%
1229     continue,do,elif,%
1230     else,end,false,fi,for,%
1231     function,if,in,local,%
1232     mod,not,od,or,%
1233     quit,rec,repeat,return,%
1234     then,true,until,while%
1235   },%
1236   sensitive,%
1237   morecomment=[l]\#,%
1238   morestring=[b]",%
1239   morestring=[b]',%
1240 }[keywords,comments,strings]
```

1241 ⟨/lang2⟩

2.26 Go—Groups, Algorithms, Programming

From https://en.wikipedia.org/wiki/Go_(programming_language): Go (often referred to as Golang) is a programming language created by Google in 2009 by Robert Griesemer, Rob Pike, and Ken Thompson. Go is a statically typed, compiled language in the tradition of C, with memory safety, garbage collection, structural typing, and CSP-style concurrency. The compiler, tools, and source code are all free and open source.

Christian Maurer provided the following language definition.

1242 ⟨∗lang3⟩

```
1243 %%
1244 %% Go definition
1245 %% (c) 2018 Christian Maurer
1246 %%
1247 \lst@definelanguage{Go}{%
1248   morekeywords={append,bool,break,byte,cap,case,chan,close,complex,%
1249     complex128,complex64,const,continue,copy,default,defer,delete,%
1250     else,error,fallthrough,false,float32,float64,for,func,go,goto,%
```

```
1251     if,imag,import,int,int16,int32,int64,int8,interface,iota,len,%
1252     make,map,new,nil,package,panic,print,println,range,real,%
1253     recover,return,rune,select,string,struct,switch,true,type,%
1254     uint,uint16,uint32,uint64,uint8,uintptr,var},%
1255   sensitive,%
1256   morecomment=[s]{/*}{*/},%
1257   morecomment=[l]//,%
1258   morestring=[b]',%
1259   morestring=[b]",%
1260   morestring=[s]{`}{`},%
1261 }[keywords,comments,strings]

1262 ⟨/lang3⟩
```

2.27 Guarded Command Language (GCL)

As you can read below, Mark van Eijk provided this language definition.

```
1263 ⟨*lang2⟩

1264 %%
1265 %% Guarded Command Language (GCL)   definition
1266 %% (c) 2002 Mark van Eijk
1267 %%
1268 \lst@definelanguage{GCL}%
1269   {morekeywords={const,con,var,array,of,skip,if,fi,do,od,div,mod},%
1270   literate={|[}{\ensuremath{|\hskip -0.1em[}}2%
1271           {]|}{\ensuremath{]\hskip -0.1em|}}2%
1272     {[]}{\ensuremath{[\hskip -0.1em]}}2%
1273     {->}{\ensuremath{\rightarrow}~}2%
1274     {==}{\ensuremath{\equiv}~}2%
1275     {>=}{\ensuremath{\geq}~}2%
1276     {<=}{\ensuremath{\leq}~}2%
1277     {/\\}{\ensuremath{\land}~}2%
1278     {\\/}{\ensuremath{\lor}~}2%
1279     {!}{\ensuremath{\lnot}}1%
1280     {!=}{\ensuremath{\neq}~}2%
1281     {max}{\ensuremath{\uparrow}}1%
1282     {min}{\ensuremath{\downarrow}}1,%
1283   sensitive=f,%
1284   morecomment=[s]{\{}{\}},%
1285   morestring=[d]'%
1286   }[keywords,comments,strings]

1287 ⟨/lang2⟩
```

2.28 Gnuplot

Thanks to Dr. Christoph Giess for providing this definition.

```
1288 ⟨*lang2⟩
1289 %%
1290 %% gnuplot definition (c) Christoph Giess
```

```
1291 %%
1292 \lst@definelanguage{Gnuplot}%
1293   {keywords={abs,acos,acosh,arg,asin,asinh,atan,atan2,atanh,besj0,%
1294         besj1,besy0,besy1,ceil,cos,cosh,erf,erfc,exp,floor,gamma,ibeta,%
1295         inverf,igamma,imag,invnorm,int,lgamma,log,log10,norm,rand,real,%
1296         sgn,sin,sinh,sqrt,tan,tanh,column,tm_hour,tm_mday,tm_min,tm_mon,%
1297         tm_sec,tm_wday,tm_yday,tm_year,valid,cd,call,clear,exit,fit,%
1298         help,if,load,pause,plot,print,pwd,quit,replot,reread,reset,save,%
1299         set,show,shell,splot,test,update,angles,arrow,autoscale,border,%
1300         boxwidth,clabel,clip,cntrparam,contour,data,dgrid3d,dummy,%
1301         format,function,functions,grid,hidden3d,isosamples,key,keytitle,%
1302         label,logscale,mapping,offsets,output,parametric,pointsize,%
1303         polar,rrange,samples,size,style,surface,terminal,tics,time,%
1304         timefmt,title,trange,urange,variables,view,vrange,xdata,xlabel,%
1305         xmargin,xrange,xtics,mxtics,mytics,xdtics,xmtics,xzeroaxis,%
1306         ydata,ylabel,yrange,ytics,ydtics,ymtics,yzeroaxis,zdata,zero,%
1307         zeroaxis,zlabel,zrange,ztics,zdtics,zmtics,timefm,using,title,%
1308         with,index,every,thru,smooth},%
1309     sensitive,%
1310     comment=[l]\#,%
1311     morestring=[b]",%
1312     morestring=[b]',%
1313   }[keywords,comments,strings]
1314 ⟨/lang2⟩
```

2.29 Hansl/Gretl

Thanks to Ignacio Díaz-Emparanza, Riccardo (Jack) Lucchetti, and Sven Schreiber for providing the definition of hansl. Hansl is the gretl scripting language (see http://gretl.sourceforge.net).

```
1315 ⟨*lang2⟩
1316 \lst@definelanguage{hansl}{%
1317   showstringspaces = false, %
1318   morekeywords={ % hansl commands:
1319     add, adf, anova, append, ar, ar1, arbond, arch, arima, biprobit, break,%
1320     boxplot, chow, clear, coeffsum, coint, coint2, corr, corrgm, cusum,%
1321     data, dataset, delete, diff, difftest, discrete, dpanel, dummify,%
1322     duration, elif, else, end, endif, endloop, eqnprint, equation,%
1323     estimate, eval, fcast, flush, foreign, fractint, freq, function,%
1324     funcerr, garch, genr, gmm, gnuplot, graphpg, hausman, heckit, help,%
1325     hfplot, hsk, hurst, if, include, info, intreg, join, kpss, labels, lad,%
1326     lags, ldiff, leverage, levinlin, logistic, logit, logs, loop, mahal,%
1327     makepkg, markers, meantest, midasreg, mle, modeltab, modprint, modtest,%
1328     mpi, mpols, negbin, nls, normtest, nulldata, ols, omit, open, orthdev,%
1329     outfile, panel, pca, pergm, plot, poisson, print, printf, probit,%
1330     pvalue, quantreg, qlrtest, qqplot, quit, rename, reset, restrict,%
1331     rmplot, run, runs, scatters, sdiff, set, setinfo, setobs, setopt,%
1332     setmiss, smpl, spearman, square, store,%
1333     summary, system, tabprint, textplot, tobit, tsls, var, varlist,%
```

```
1334    vartest, vecm, vif, wls, xcorrgm, xtab, debug, return, catch, pkg,%
1335    arma, deriv, params, hessian, for, foreach, while, const},%
1336  morekeywords=[2]{ % accessors:
1337    \$nobs, \$nvars, \$pd, \$t1, \$t2, \$tmax, \$datatype, \$test,%
1338    \$pvalue, \$qlrbreak, \$rlnl, \$stopwatch, \$unit, \$obsmajor,%
1339    \$obsminor, \$obsmicro, \$obsdate, \$windows, \$version, \$error,%
1340    \$seed, \$huge, \$ess, \$T, \$rsq, \$sigma, \$df, \$ncoeff, \$lnl,%
1341    \$gmmcrit, \$aic, \$bic, \$hqc, \$trsq, \$dw, \$dwpval, \$Fstat,%
1342    \$chisq, \$diagtest, \$diagpval, \$pmanteau, \$uhat, \$yhat, \$llt,%
1343    \$ahat, \$sample, \$h, \$coeff, \$stderr, \$vcv, \$rho, \$compan,%
1344    \$xtxinv, \$vecGamma, \$vma, \$fevd, \$evals, \$jalpha, \$jbeta,%
1345    \$jvbeta, \$s00, \$s11, \$s01, \$ec, \$hausman, \$sargan, \$sysGamma,%
1346    \$sysA, \$sysB, \$fcast, \$fcse, \$coeff_ci, \$ehat, \$mnlprobs,%
1347    \$xlist, \$ylist, \$command, \$depvar, \$model, \$system, \$sysinfo},%
1348  morekeywords=[3]{ % functions
1349    BFGScmax, BFGSmax, GSSmax, I, NMmax, NRmax, abs, acos, acosh,%
1350    aggregate, argname, array, asin, asinh, atan, atanh, atof, bessel,%
1351    bkfilt, bootci, bootpval, boxcox, bread, bwfilt, bwrite, cdemean, cdf,%
1352    cdiv, cdummify, ceil, cholesky, chowlin, cmult, cnameget, cnameset,%
1353    cnorm, cnumber, cols, corr, corrgm, cos, cosh, cov, critical, cum,%
1354    curl, dayspan, defarray, defbundle, deflist, deseas, det, diag,%
1355    diagcat, diff, digamma, dnorm, dropcoll, dsort, dummify, easterday,%
1356    ecdf, eigengen, eigensym, eigsolve, epochday, errmsg, exists, exp,%
1357    fcstats, fdjac, feval, fevd, fft, ffti, filter, firstobs, fixname,%
1358    floor, fracdiff, fraclag, freq, gammafun, genseries, getenv, getinfo,%
1359    getkeys, getline, ghk, gini, ginv, grab, halton, hdprod, hfdiff,%
1360    hflags, hfldiff, hflist, hpfilt, imaxc, imaxr, imhof, iminc, iminr,%
1361    inbundle, infnorm, inlist, instring, int, inv, invcdf, invmills, invpd,%
1362    irf, irr, isconst, isdiscrete, isdummy, isnan, isoconv, isodate,%
1363    iwishart, jsonget, jsongetb, juldate, kdensity, kdsmooth, kfilter,%
1364    kmeier, kpsscrit, ksetup, ksimdata, ksimul, ksmooth, kurtosis, lags,%
1365    lastobs, ldet, ldiff, lincomb, linearize, ljungbox, lngamma, loess,%
1366    log, log10, log2, logistic, lower, lrcovar, lrvar, max, maxc, maxr,%
1367    mcorr, mcov, mcovg, mean, meanc, meanr, median, mexp, mgradient, min,%
1368    minc, minr, missing, misszero, mlag, mlincomb, mnormal, mols, monthlen,%
1369    movavg, mpiallred, mpibcast, mpirecv, mpireduce, mpiscatter, mpisend,%
1370    mpols, mrandgen, mread, mreverse, mrls, mshape, msortby, muniform,%
1371    mweights, mwrite, mxtab, naalen, nadarwat, nelem, ngetenv, nlines,%
1372    nobs, normal, normtest, npcorr, npv, nullspace, numhess, obslabel,%
1373    obsnum, ok, onenorm, ones, orthdev, pdf, pergm, pexpand, pmax, pmean,%
1374    pmin, pnobs, polroots, polyfit, princomp, printf, prodc, prodr, psd,%
1375    psdroot, pshrink, psum, pvalue, pxnobs, pxsum, qform, qlrpval, qnorm,%
1376    qrdecomp, quadtable, quantile, randgen, randgen1, randint, rank,%
1377    ranking, rcond, readfile, regsub, remove, replace, resample, rnameget,%
1378    rnameset, round, rows, sd, sdc, sdiff, seasonals, selifc, selifr, seq,%
1379    setnote, simann, sin, sinh, skewness, sleep, smplspan, sort, sortby,%
1380    sprintf, sqrt, square, sscanf, sst, stringify, strlen, strncmp,%
1381    strsplit, strstr, strstrip, strsub, strvals, substr, sum, sumall, sumc,%
1382    sumr, svd, svm, tan, tanh, toepsolv, tolower, toupper, tr, transp,%
1383    trimr, typeof, typestr, uniform, uniq, unvech, upper, urcpval, values,%
```

```
1384    var, varname, varnames, varnum, varsimul, vec, vech, weekday, wmean,%
1385    wsd, wvar, xmax, xmin, xmlget, zeromiss, zeros, NMmin, GSSmin,%
1386    BFGScmin, BFGSmin },%
1387  morekeywords=[4]{ % genr aliases:
1388    null, series, scalar, matrix, string, list, bundle, strings, matrices,%
1389    bundles, lists%
1390  },%
1391  sensitive=t,%
1392  morecomment=[l]{\#},%
1393  morecomment=[s]{/*}{*/},%
1394  morestring=[b]{"}%
1395 }%
1396 \lstalias{gretl}{hansl}
```

1397 ⟨/lang2⟩

The developers of the hansl support also supplied a definition of a style for printing hansl code:

1398 ⟨∗hansl-prf⟩

```
1399 \usepackage[rgb, x11names]{xcolor}
1400
1401 % settings for black and white
1402 \lstdefinestyle{hanslbw}{%
1403   keywordstyle = \bfseries,
1404   keywordstyle = [2]\bfseries,
1405   keywordstyle = [3]\itshape,
1406   keywordstyle = [4]\underbar,
1407   commentstyle = \ttfamily,
1408   stringstyle = \ttfamily
1409 }
1410 % settings for colored printing
1411 \lstdefinestyle{hanslcolor}{%
1412   basicstyle = \small\ttfamily,
1413   keywordstyle = \color{red},
1414   keywordstyle = [2]\color{green},
1415   keywordstyle = [3]\color{cyan},
1416   keywordstyle = [4]\color{olive},
1417   commentstyle = \color{blue}\rmfamily, %
1418   stringstyle = \color{magenta},
1419   moredelim = [l][\color{green}]{--}
1420 }%
```

This code is provided in the file `listings-hansl.prf`, see section 2.4.1 (Preferences) of the listings documentation.

1421 ⟨/hansl-prf⟩

2.30   Haskell

Thanks to Peter Bartke for providing the new definition.

1422 ⟨∗lang2⟩

```
1423 %%
1424 %% Haskell98 as implemented in Hugs98. See http://www.haskell.org
1425 %% All keywords from Prelude and Standard Libraries
1426 %% (c) 1999 Peter Bartke
1427 %%
1428 \lst@definelanguage{Haskell}%
1429   {otherkeywords={=>},%
1430   morekeywords={abstype,if,then,else,case,class,data,default,deriving,%
1431       hiding,if,in,infix,infixl,infixr,import,instance,let,module,%
1432       newtype,of,qualified,type,where,do,AbsoluteSeek,AppendMode,%
1433       Array,BlockBuffering,Bool,BufferMode,Char,Complex,Double,Either,%
1434       FilePath,Float,Int,Integer,IO,IOError,Ix,LineBuffering,Maybe,%
1435       Ordering,NoBuffering,ReadMode,ReadWriteMode,ReadS,RelativeSeek,%
1436       SeekFromEnd,SeekMode,ShowS,StdGen,String,Void,Bounded,Enum,Eq,%
1437       Eval,ExitCode,exitFailure,exitSuccess,Floating,Fractional,%
1438       Functor,Handle,HandlePosn,IOMode,Integral,List,Monad,MonadPlus,%
1439       MonadZero,Num,Numeric,Ord,Random,RandomGen,Ratio,Rational,Read,%
1440       Real,RealFloat,RealFrac,Show,System,Prelude,EQ,False,GT,Just,%
1441       Left,LT,Nothing,Right,WriteMode,True,abs,accum,accumArray,%
1442       accumulate,acos,acosh,all,and,any,ap,appendFile,applyM,%
1443       approxRational,array,asTypeOf,asin,asinh,assocs,atan,atan2,atanh,%
1444       bounds,bracket,bracket_,break,catch,catMaybes,ceiling,chr,cis,%
1445       compare,concat,concatMap,conjugate,const,cos,cosh,curry,cycle,%
1446       decodeFloat,delete,deleteBy,deleteFirstsBy,denominator,%
1447       digitToInt,div,divMod,drop,dropWhile,either,elem,elems,elemIndex,%
1448       elemIndices,encodeFloat,enumFrom,enumFromThen,enumFromThenTo,%
1449       enumFromTo,error,even,exitFailure,exitWith,exp,exponent,fail,%
1450       filter,filterM,find,findIndex,findIndices,flip,floatDigits,%
1451       floatRadix,floatRange,floatToDigits,floor,foldl,foldM,foldl1,%
1452       foldr,foldr1,fromDouble,fromEnum,fromInt,fromInteger,%
1453       fromIntegral,fromJust,fromMaybe,fromRat,fromRational,%
1454       fromRealFrac,fst,gcd,genericLength,genericTake,genericDrop,%
1455       genericSplitAt,genericIndex,genericReplicate,getArgs,getChar,%
1456       getContents,getEnv,getLine,getProgName,getStdGen,getStdRandom,%
1457       group,groupBy,guard,hClose,hFileSize,hFlush,hGetBuffering,%
1458       hGetChar,hGetContents,hGetLine,hGetPosn,hIsClosed,hIsEOF,hIsOpen,%
1459       hIsReadable,hIsSeekable,hIsWritable,hLookAhead,hPutChar,hPutStr,%
1460       hPutStrLn,hPrint,hReady,hSeek,hSetBuffering,hSetPosn,head,%
1461       hugsIsEOF,hugsHIsEOF,hugsIsSearchErr,hugsIsNameErr,%
1462       hugsIsWriteErr,id,ioError,imagPart,index,indices,init,inits,%
1463       inRange,insert,insertBy,interact,intersect,intersectBy,%
1464       intersperse,intToDigit,ioeGetErrorString,ioeGetFileName,%
1465       ioeGetHandle,isAlreadyExistsError,isAlreadyInUseError,isAlpha,%
1466       isAlphaNum,isAscii,isControl,isDenormalized,isDoesNotExistError,%
1467       isDigit,isEOF,isEOFError,isFullError,isHexDigit,isIEEE,%
1468       isIllegalOperation,isInfinite,isJust,isLower,isNaN,%
1469       isNegativeZero,isNothing,isOctDigit,isPermissionError,isPrefixOf,%
1470       isPrint,isSpace,isSuffixOf,isUpper,isUserError,iterate,ixmap,%
1471       join,last,lcm,length,lex,lexDigits,lexLitChar,liftM,liftM2,%
1472       liftM3,liftM4,liftM5,lines,listArray,listToMaybe,log,logBase,%
```

```
1473        lookup,magnitude,makePolar,map,mapAccumL,mapAccumR,mapAndUnzipM,%
1474        mapM,mapM_,mapMaybe,max,maxBound,maximum,maximumBy,maybe,%
1475        maybeToList,min,minBound,minimum,minimumBy,mkPolar,mkStdGen,%
1476        mplus,mod,msum,mzero,negate,next,newStdGen,not,notElem,nub,nubBy,%
1477        null,numerator,odd,openFile,or,ord,otherwise,partition,phase,pi,%
1478        polar,pred,print,product,properFraction,putChar,putStr,putStrLn,%
1479        quot,quotRem,random,randomIO,randomR,randomRIO,randomRs,randoms,%
1480        rangeSize,read,readDec,readFile,readFloat,readHex,readInt,readIO,%
1481        readList,readLitChar,readLn,readParen,readOct,readSigned,reads,%
1482        readsPrec,realPart,realToFrac,recip,rem,repeat,replicate,return,%
1483        reverse,round,scaleFloat,scanl,scanl1,scanr,scanr1,seq,sequence,%
1484        sequence_,setStdGen,show,showChar,showEFloat,showFFloat,%
1485        showFloat,showGFloat,showInt,showList,showLitChar,showParen,%
1486        showSigned,showString,shows,showsPrec,significand,signum,sin,%
1487        sinh,snd,sort,sortBy,span,split,splitAt,sqrt,stderr,stdin,stdout,%
1488        strict,subtract,succ,sum,system,tail,tails,take,takeWhile,tan,%
1489        tanh,toEnum,toInt,toInteger,toLower,toRational,toUpper,transpose,%
1490        truncate,try,uncurry,undefined,unfoldr,union,unionBy,unless,%
1491        unlines,until,unwords,unzip,unzip3,unzip4,unzip5,unzip6,unzip7,%
1492        userError,when,words,writeFile,zero,zip,zip3,zip4,zip5,zip6,zip7,%
1493        zipWith,zipWithM,zipWithM_,zipWith3,zipWith4,zipWith5,zipWith6,%
1494        zipWith7},%
1495      sensitive,%
1496      morecomment=[l]--,%
1497      morecomment=[n]{\{-}{-\}},%
1498      morestring=[b]"%
1499    }[keywords,comments,strings]

1500 ⟨/lang2⟩
```

2.31   HTML

I'm quite the opposite of a HTML wizard. In particular this is true for the defined keywords. Matthias Bethke helped me out and extended the list.

```
1501 ⟨∗lang1⟩

1502 \lst@definelanguage{HTML}%
1503    {morekeywords={A,ABBR,ACRONYM,ADDRESS,APPLET,AREA,B,BASE,BASEFONT,%
1504        BDO,BIG,BLOCKQUOTE,BODY,BR,BUTTON,CAPTION,CENTER,CITE,CODE,COL,%
1505        COLGROUP,DD,DEL,DFN,DIR,DIV,DL,DOCTYPE,DT,EM,FIELDSET,FONT,FORM,%
1506        FRAME,FRAMESET,HEAD,HR,H1,H2,H3,H4,H5,H6,HTML,I,IFRAME,IMG,INPUT,%
1507        INS,ISINDEX,KBD,LABEL,LEGEND,LH,LI,LINK,LISTING,MAP,META,MENU,%
1508        NOFRAMES,NOSCRIPT,OBJECT,OPTGROUP,OPTION,P,PARAM,PLAINTEXT,PRE,%
1509        OL,Q,S,SAMP,SCRIPT,SELECT,SMALL,SPAN,STRIKE,STRING,STRONG,STYLE,%
1510        SUB,SUP,TABLE,TBODY,TD,TEXTAREA,TFOOT,TH,THEAD,TITLE,TR,TT,U,UL,%
1511        VAR,XMP,%
1512        accesskey,action,align,alink,alt,archive,axis,background,bgcolor,%
1513        border,cellpadding,cellspacing,charset,checked,cite,class,classid,%
1514        code,codebase,codetype,color,cols,colspan,content,coords,data,%
1515        datetime,defer,disabled,dir,event,error,for,frameborder,headers,%
```

```
1516        height,href,hreflang,hspace,http-equiv,id,ismap,label,lang,link,%
1517        longdesc,marginwidth,marginheight,maxlength,media,method,multiple,%
1518        name,nohref,noresize,noshade,nowrap,onblur,onchange,onclick,%
1519        ondblclick,onfocus,onkeydown,onkeypress,onkeyup,onload,onmousedown,%
1520        profile,readonly,onmousemove,onmouseout,onmouseover,onmouseup,%
1521        onselect,onunload,rel,rev,rows,rowspan,scheme,scope,scrolling,%
1522        selected,shape,size,src,standby,style,tabindex,text,title,type,%
1523        units,usemap,valign,value,valuetype,vlink,vspace,width,xmlns},%
1524     tag=**[s]<>,%
1525     sensitive=f,%
1526     morestring=[d]",% ??? doubled
```

Now we take care of comments. We don't enter comment mode if we aren't inside
<>.

```
1527     MoreSelectCharTable=%
1528        \lst@CArgX--\relax\lst@DefDelimB{}{}%
1529            {\ifnum\lst@mode=\lst@tagmode\else
1530                \expandafter\@gobblethree
1531             \fi}%
1532            \lst@BeginComment\lst@commentmode{{\lst@commentstyle}}%
1533        \lst@CArgX--\relax\lst@DefDelimE{}{}{}%
1534            \lst@EndComment\lst@commentmode
1535    }[keywords,comments,strings,html]%
```

Peter Biechele reported a problem which was due to missing `\@empty` in value
of `SelectCharTable`. And after receiving a bug report from Jochen Schneider I
converted the version 0.21 contents of `MoreSelectCharTable` to version 1.0.

1536 ⟨/lang1⟩

2.32   IDL

The definition is from Jürgen Heim.

1537 ⟨*lang2⟩

```
1538 %%
1539 %% IDL definition (c) 1998 Juergen Heim
1540 %%
1541 \lst@definelanguage{IDL}%
1542   {morekeywords={and,begin,case,common,do,else,end,endcase,endelse,%
1543       endfor,endif,endrep,endwhile,eq,for,function,ge,goto,gt,if,le,lt,%
1544       mod,ne,not,of,on_ioerror,or,pro,repeat,return,then,until,while,%
1545       xor,on_error,openw,openr,openu,print,printf,printu,plot,read,%
1546       readf,readu,writeu,stop},%
1547   sensitive=f,%
1548   morecomment=[l];,%
1549   morestring=[d]'%
1550  }[keywords,comments,strings]
```

1551 ⟨/lang2⟩

2.33   Inform

Thanks to Jonathan Sauer for this language definition. Ulrike Fischer pointed out that `\lstdefinelanguage` should be `\lst@definelanguage`.

1552 ⟨∗lang2⟩

```
1553 %%
1554 %% Inform definition (c) 2003 Jonathan Sauer
1555 %%
1556 \lst@definelanguage{Inform}{%
1557   % Language keywords
1558   morekeywords={breakdo,else,false,for,has,hasnt,if,%
1559     in,indirect,jump,notin,nothing,NULL,objectloop,ofclass,%
1560     private,property,provides,return,rfalse,rtrue,self,string,%
1561     switch,to,true,until,while,with,%
1562     creature,held,multiexcept,multiheld,multiinside,noun,number,%
1563     scope,topic},%
1564   %
1565   % Inform functions
1566   morekeywords=[2]{box,child,children,font,give,inversion,metaclass,move,%
1567     new_line,parent,print,print_ret,read,remove,restore,sibling,%
1568     save,spaces,quit,style,bold,underline,reverse,roman remaining,%
1569     create,destroy,recreate,copy},%
1570   %
1571   % Inform definitions
1572   morekeywords=[3]{Attribute,Array,Class,Constant,Default,End,Endif,Extend,%
1573     Global,Ifdef,Iffalse,Ifndef,Ifnot,Iftrue,Include,Object,%
1574     Property,Verb,Release,Serial,Statusline},%
1575   %
1576   % Library attributes
1577   morekeywords=[4]{absent,animate,clothing,concealed,container,door,edible,%
1578     enterable,female,general,light,lockable locked,male,moved,%
1579     neuter,on,open,openable,pluralname,proper,scenery,scored,%
1580     static,supporter,switchable,talkable,transparent,visited,%
1581     workflag,worn},%
1582   %
1583   % Library properties
1584   morekeywords=[5]{n_to,s_to,e_to,w_to,ne_to,nw_to,se_to,sw_to,in_to,%
1585     out_to,u_to,d_to,add_to_scope,after,article,articles,before,%
1586     cant_go,capacity,daemon,describe,description,door_dir,door_to,%
1587     each_turn,found_in,grammar,initial,inside_description,invent,%
1588     life,list_together,name number,orders,parse_name,plural,%
1589     react_after,react_before,short_name,short_name_indef,time_left,%
1590     time_out,when_closed,when_open,when_on,when_off,%
1591     with_key},%
1592   %
1593   % Library routines
1594   morekeywords=[6]{Achieved,AfterRoutines,AllowPushDir,Banner,ChangePlayer,%
1595     CommonAncestor,DictionaryLookup,GetGNAOfObject,HasLightSource,%
1596     IndirectlyContains,IsSeeThrough,Locale,LoopOverScope,LTI_Insert,%
```

```
1597    MoveFloatingObjects,NextWord,NextWordStopped,NounDomain,%
1598    ObjectIsUntouchable OffersLight,ParseToken,PlaceInScope,PlayerTo,%
1599    PronounNotice,PronounValue,ScopeWithin,SetPronoun,SetTime,%
1600    StartDaemon,StartTimer,StopDaemon,StopTimer,TestScope,TryNumber,%
1601    UnsignedCompare,WordAddress,WordInProperty,WordLength,%
1602    WriteListFrom,YesOrNo},%
1603    %
1604    % Library,entry points
1605    morekeywords=[7]{AfterLife,AfterPrompt,Amusing,BeforeParsing,ChooseObjects,%
1606    DarkToDark,DeathMessage,GamePostRoutine GamePreRoutine,%
1607    Initialise,InScope,LookRoutine,NewRoom,ParseNoun,ParseNumber,%
1608    ParserError,PrintRank,PrintTaskName,PrintVerb,TimePasses,%
1609    UnknownVerb},%
1610    %
1611    % Library constants
1612    morekeywords=[8]{NEWLINE_BIT,INDENT_BIT,FULLINV_BIT,ENGLISH_BIT,%
1613    RECURSE_BIT,ALWAYS_BIT,TERSE_BIT,PARTINV_BIT,DEFART_BIT,%
1614    WORKFLAG_BIT,ISARE_BIT,CONCEAL_BIT},%
1615    %
1616    % Library,meta actions
1617    morekeywords=[9]{Pronouns,Quit,Restart,Restore,Save,Verify,ScriptOn,%
1618    ScriptOff,NotifyOn,NotifyOff,Places,Objects,Score,FullScore,Version,%
1619    LMode1,LMode2,LMode3},%
1620    %
1621    % Library,main actions
1622    morekeywords=[10]{Close,Disrobe,Drop,Eat,Empty,EmptyT,Enter,Examine,%
1623    Exit,GetOff,Give,Go,GoIn,Insert,Inv,InvTall,InvWide,Lock,Look,Open,%
1624    PutOn,Remove,Search,Show,SwitchOff,SwitchOn,Take,Transfer,%
1625    Unlock VagueGo, Wear},%
1626    %
1627    % Library,stub actions
1628    morekeywords=[11]{Answer,Ask,AskFor,Attack,Blow,Burn,Buy,Climb,%
1629    Consult,Cut,Dig,Drink,Fill,Jump,JumpOver,Kiss,Listen,LookUnder,%
1630    Mild,No,Pray,Pull,Push,PushDir,Rub,Set,SetTo,Sing,Sleep,Smell,%
1631    Sleep,Smell,Sorry,Squeeze,Strong,Swim,Swing,Taste,Tell,Think,%
1632    ThrowAt,Tie,Touch,Turn,
1633    Wait,Wake,WakeOther,Wave,WaveHands,Yes},%
1634    %
1635    otherkeywords={->,-->},%
1636    sensitive=false,%
1637    morestring=[d]{"},%
1638    morecomment=[l]{!}%
1639 }[keywords,comments,strings]

1640 ⟨/lang2⟩
```

2.34   Java and other JVM based languages

Robert Wenner sent in the first of the following two definitions.

```
1641 ⟨*lang1⟩
```

```
1642 %%
1643 %% AspectJ definition (c) Robert Wenner
1644 %%
1645 \lst@definelanguage[AspectJ]{Java}[]{Java}%
1646   {morekeywords={%
1647       adviceexecution,after,args,around,aspect,aspectOf,before,%
1648       call,cflow,cflowbelow,%
1649 % declare error,declare parents,declare precedence,
1650 % declare soft,declare warning,
1651       execution,get,handler,if,initialization,issingleton,pointcut,%
1652       percflow,percflowbelow,perthis,pertarget,preinitialization,%
1653       privileged,proceed,returning,set,staticinitialization,strictfp,%
1654       target,this,thisEnclosingJoinPoint,thisJoinPoint,throwing,%
1655       within,withincode},%
1656   MoreSelectCharTable=%
1657     \lst@DefSaveDef{'.}\lst@umdot{\lst@umdot\global\let\lst@derefop\@empty}%
1658     \ifx\lst@derefinstalled\@empty\else
1659       \global\let\lst@derefinstalled\@empty
1660 \lst@AddToHook{Output}%
1661 {\lst@ifkeywords
1662    \ifx\lst@derefop\@empty
1663      \global\let\lst@derefop\relax
1664      \ifx\lst@thestyle\lst@gkeywords@sty
1665        \ifx\lst@currstyle\relax
1666          \let\lst@thestyle\lst@identifierstyle
1667        \else
1668          \let\lst@thestyle\lst@currstyle
1669        \fi
1670      \fi
1671    \fi
1672 \fi}
1673 \lst@AddToHook{BOL}{\global\let\lst@derefop\relax}%
1674 \lst@AddTo\lst@ProcessSpace{\global\let\lst@derefop\relax}%
1675     \fi
1676   }%

1677 ⟨/lang1⟩
```

Got data from `http://java.sun.com`.

```
1678 ⟨*lang1⟩

1679 \lst@definelanguage{Java}%
1680   {morekeywords={abstract,boolean,break,byte,case,catch,char,class,%
1681       const,continue,default,do,double,else,extends,false,final,%
1682       finally,float,for,goto,if,implements,import,instanceof,int,%
1683       interface,label,long,native,new,null,package,private,protected,%
1684       public,return,short,static,super,switch,synchronized,this,throw,%
1685       throws,transient,true,try,void,volatile,while},%
1686   sensitive,%
1687   morecomment=[l]//,%
1688   morecomment=[s]{/*}{*/},%
```

```
1689    morestring=[b]",%
1690    morestring=[b]',%
1691  }[keywords,comments,strings]
```

Herbert Voss added the keyword `label`.

```
1692 ⟨/lang1⟩
```

2.34.1 JVMIS—The Java bytecode instructions

Martine Gautier made the following contribution.

```
1693 ⟨*lang1⟩

1694 %%
1695 %% ByteCodeJava definition (c) 2004 Martine Gautier
1696 %%
1697 \lst@definelanguage{JVMIS}%
1698   {morekeywords={aaload,astore,aconst_null,aload,aload_0,aload_1,%
1699       aload_2,aload_3,anewarray,areturn,arraylength,astore,astore_0,%
1700       astore_1,astore_2,astore_3,athrow,baload,bastore,bipush,caload,%
1701       castore,checkcast,d2f,d2i,d2l,dadd,daload,dastore,dcmpg,dcmpl,%
1702       dconst_0,dconst_1,ddiv,dload,dload_0,dload_1,dload_2,dload_3,%
1703       dmul,dneg,drem,dreturn,dstore,dstore_0,dstore_1,dstore_2,%
1704       dstore_3,dsub,dup,dup_x1,dup_x2,dup2,dup2_x1,dup2_x2,f2d,%
1705       f2i,f2l,fadd,faload,fastore,fcmpg,fcmpl,fconst_0,fconst_1,%
1706       fconst_2,fdiv,fload,fload_0,fload_1,fload_2,fload_3,fmul,%
1707       fneg,frem,freturn,fstore,fstore_0,fstore_1,fstore_2,fstore_3,%
1708       fsub,getfield,getstatic,goto,goto_w,i2b,i2c,i2d,i2f,i2l,i2s,%
1709       iadd,iaload,iand,iastore,iconst_0,iconst_1,iconst_2,iconst_3,%
1710       iconst_4,iconst_5,idiv,if_acmpeq,if_acmpne,if_icmpeq,if_icmpne,%
1711       if_icmplt,if_cmpge,if_cmpgt,if_cmple,ifeq,ifne,iflt,ifge,ifgt,%
1712       ifle,ifnonnull,ifnull,iinc,iload,iload_0,iload_1,iload_2,%
1713       iload_3,imul,ineg,instanceof,invokeinterface,invokespecial,%
1714       invokestatic,invokevirtual,ior,irem,ireturn,ishl,ishr,istore,%
1715       istore_0,istore_1,istore_2,istore_3,isub,iushr,ixor,jsr,jsr_w,%
1716       l2d,l2f,l2i,ladd,laload,land,lastore,lcmp,lconst_0,lconst_1,%
1717       ldc,ldc_w,ldc2_w,ldiv,lload,lload_0,lload_1,lload_2,lload_3,%
1718       lmul,lneg,lookupswitch,lor,lrem,lreturn,lshl,lshr,lstore,%
1719       lstore_0,lstore_1,lstore_2,lstore_3,lsub,lushr,lxor,%
1720       monitorenter,monitorexit,multianewarray,new,newarray,nop,pop,%
1721       pop2,putfield,putstatic,ret,return,saload,sastore,sipush,swap,%
1722       tableswitch,wide,limit,locals,stack},%
1723  }[keywords]%

1724 ⟨/lang1⟩
```

2.34.2 Scala

Bastian Germann asked to include the Scala definition provided by Frank Teubler
(2009). Here it is—the definition has got a small overhaul according to the Scala

syntax published for version 2.13 (https://scala-lang.org/files/archive/spec/2.13/spec.pdf):

1725 ⟨∗lang3⟩

```
1726 \lst@definelanguage{Scala}{%
1727   morekeywords={abstract,case,catch,class,def,%
1728     do,else,extends,false,final,finally,%
1729     for,forSome,if,implicit,import,lazy,macro,match,%
1730     mixin,new,null,object,override,package,%
1731     private,protected,requires,return,sealed,%
1732     super,this,trait,true,try,%
1733     type,val,var,while,with,yield},%+
1734   otherkeywords={_, :, =, =>, <-, <\%, <:, >:, \#, @},%
1735   sensitive,%
1736   morecomment=[l]//,%
1737   morecomment=[n]{/*}{*/},%
1738   morestring=[b]",%
1739   morestring=[b]',%
1740   morestring=[b]""",%
1741 }[keywords,comments,strings]
```

Remark: This definition contains the keywords `mixin` and `requires`, which don't belong to the official Scala 2.13 language definition, the keywords `forSome`, `macro`, and `throw`, which were missing in listings prior than v1.10a, are added silently. The Unicode operators \u21D2 and \u2190, which have the ASCII equivalents `=>` and `<-`, are also reserved but cannot be used with PDFTEX.

Deloo asked for Scala 3.0 support. The following code according to https://docs.scala-lang.org/scala3/reference/syntax.html is a simple approach, listings cannot correctly support soft keywords, because they are context dependent.

```
1742 \lst@definelanguage[3.0]{Scala}[]{Scala}{%
1743   morekeywords={as, derives, end, enum, export, extension, given},
1744   morekeywords=[2]{infix, inline, opaque, open, transparent}
1745   otherkeywords={=>>, ?=>, =>}, % =>> isn't recognized, even after
1746                                % the keyword => is deleted
1747   alsoletter={*, +, -, |},
1748   deletekeywords={<\%, _, forSome, macro, mixin, requires, this},
1749 }[keywords,comments,strings]
```

1750 ⟨/lang3⟩

2.35 ksh

Thanks to Jeffrey Ratcliffe for this language definition.

1751 ⟨∗lang3⟩

```
1752 \lst@definelanguage{ksh}
1753   {morekeywords={alias,awk,cat,echo,else,elif,fi,exec,exit,%
1754     for,in,do,done,select,case,esac,while,until,function,%
1755     time,export,cd,eval,fc,fg,kill,let,pwd,read,return,rm,%
```

```
1756        glob,goto,history,if,logout,nice,nohup,onintr,repeat,sed,%
1757        set,setenv,shift,source,switch,then,umask,unalias,%
1758        unset,wait,@,env,argv,child,home,ignoreeof,noclobber,%
1759        noglob,nomatch,path,prompt,shell,status,verbose,print,printf,%
1760        sqrt,BEGIN,END},%
1761    morecomment=[l]\#,%
1762    morestring=[d]",%
1763    morestring=[d]',%
1764    morestring=[d]`%
1765    }[keywords,comments,strings]
```

1766 ⟨/lang3⟩

Herbert Voss suggested to add the string delimiter '.

2.36 Lingo

Thanks to Mark Schade for this language definition.

1767 ⟨∗lang3⟩

```
1768 \lst@definelanguage{Lingo}{%
1769    morekeywords={abort, after, and, before, do, down, halt, me, new, not,%
1770        of, on, or, otherwise, pass, put, result, return, set, tell, the, then,%
1771        to, with, repeat, while, case, if, else, true, false, global, property,%
1772        \_global, \_key, \_mouse, \_movie, \_player, \_sound, \_system, abbr,%
1773        abbrev, abbreviated, abs, actionsenabled, activateapplication,%
1774        activatewindow, active3drenderer, activecastlib, activewindow,%
1775        actorlist, add, addat, addbackdrop, addcamera, addchild, addmodifier,%
1776        addoverlay, addprop, addtoworld, addvertex, alert, alerthook,%
1777        alignment, allowcustomcaching, allowgraphicmenu, allowsavelocal,%
1778        allowtransportcontrol, allowvolumecontrol, allowzooming,%
1779        alphathreshold, ambient, ambientcolor, ancestor, angle, anglebetween,%
1780        animationenabled, antialias, antialiasthreshold, append,%
1781        applicationname, applicationpath, appminimize, atan, attenuation,%
1782        attributevalue, auto, autoblend, automask, autotab, axisangle, back,%
1783        backcolor, backdrop, backgroundcolor, backspace, beep, beepon,%
1784        beginrecording, beginsprite, beveldepth, beveltype, bgcolor, bias,%
1785        bitand, bitmap, bitmapsizes, bitnot, bitor, bitrate, bitspersample,%
1786        bitxor, blend, blendconstant, blendconstantlist, blendfactor,%
1787        blendfunction, blendfunctionlist, blendlevel, blendrange, blendsource,%
1788        blendsourcelist, blendtime, bone, bonesplayer, border, both, bottom,%
1789        bottomcap, bottomradius, bottomspacing, boundary, boundingsphere, box,%
1790        boxdropshadow, boxtype, breakconnection, breakloop, brightness,%
1791        broadcastprops, browsername, buffersize, build, buttonsenabled,%
1792        buttonstyle, buttontype, bytesstreamed, boolean, cachedocverify,%
1793        cachesize, call, callancestor, camera, cameracount, cameraposition,%
1794        camerarotation, cancelidleload, castlib, castlibnum, castmemberlist,%
1795        center, centerregpoint, centerstage, changearea, channelcount, char,%
1796        characterset, charpostoloc, chars, charspacing, chartonum,%
1797        checkboxaccess, checkboxtype, checkmark, checknetmessages, child,%
1798        chunksize, clearatrender, clearcache, clearerror, clearframe,%
```

```
1799    clearglobals, clearvalue, clickloc, clickmode, clickon, clone,%
1800    clonedeep, clonemodelfromcastmember, clonemotionfromcastmember, close,%
1801    closed, closewindow, closexlib, collision, collisiondata,%
1802    collisionnormal, color, world, colorbuffer, colorbufferdepth,%
1803    colordepth, colorlist, colorrange, colors, colorsteps, commanddown,%
1804    comments, compressed, connecttonetserver, constrainh, constraint,%
1805    constrainv, continue, controldown, controller, copypixels,%
1806    copyrightinfo, copyto, copytoclipboard, cos, count, cpuhogticks,%
1807    creaseangle, creases, [contains], createfolder, createmask,%
1808    creatematte, creationdate, creator, crop, cross, crossproduct,%
1809    cuepassed, cuepointnames, cuepointtimes, currentloopstate,%
1810    currentspritenum, currenttime, cursor, cursorsize, curve, cylinder,%
1811    ate, day, deactivateapplication, deactivatewindow, debug,%
1812    debugplaybackenabled, decaymode, defaultrect, defaultrectmode, delay,%
1813    delete, deleteall, deleteat, deletecamera, deletefolder, deleteframe,%
1814    deletegroup, deletelight, deletemodel, deletemodelresource,%
1815    deletemotion, deleteone, deleteprop, deleteshader, deletetexture,%
1816    deletevertex, density, depth, depthbufferdepth, desktoprectlist,%
1817    diffuse, diffusecolor, diffuselightmap, digitalvideotimescale,%
1818    digitalvideotype, direction, directionalcolor, directionalpreset,%
1819    directtostage, disableimagingtransformation, displayface, displaymode,%
1820    distanceto, distribution, dither, done, doneparsing, dot, dotproduct,%
1821    doubleclick, downloadnetthing, drag, draw, drawrect, dropshadow,%
1822    duplicate, duplicateframe, duration, editable, editshortcutsenabled,%
1823    elapsedtime, emissive, emitter, empty, emulatemultibuttonmouse,%
1824    enabled, enablehotspot, end, endangle, endcolor, endframe,%
1825    endrecording, endsprite, endtime, enter, enterframe, environment,%
1826    erase, error, eventpassmode, exchange, exists, exit, exitframe,%
1827    exitlock, exp, externalevent, externalparamcount, externalparamname,%
1828    externalparamvalue, extractalpha, extrude3d, face, fadein, fadeout,%
1829    fadeto, far, field, fieldofview, filename, fill, fillcolor, fillcycles,%
1830    filldirection, filled, fillmode, filloffset, fillscale, findempty,%
1831    findlabel, findpos, findposnear, finishidleload, firstindent,%
1832    fixedlinespace, fixedrate, fixstagesize, flashrect, flashtostage, flat,%
1833    fliph, flipv, float, floatp, floatprecision, flush, flushinputevents,%
1834    fog, folderchar, font, fontsize, fontstyle, forecolor, forget, frame,%
1835    framecount, framelabel, framepalette, framerate, frameready,%
1836    framescript, framesound1, framesound2, framestohms, frametempo,%
1837    frametransition, freeblock, freebytes, fromcastmember, fromimageobject,%
1838    front, frontwindow, generatenormals, getaprop, getat,%
1839    getbehaviordescription, getbehaviortooltip, getboneid, geterror,%
1840    geterrorstring, gethardwareinfo, gethotspotrect, getlast,%
1841    getlatestnetid, getnetaddresscookie, getneterrorstring, getnetmessage,%
1842    getnetoutgoingbytes, getnettext, getnormalized, getnthfilenameinfolder,%
1843    getnumberwaitingnetmessages, getone, getpeerconnectionlist, getpixel,%
1844    getplaylist, getpos, getpref, getprop, getpropat,%
1845    getpropertydescriptionlist, getrendererservices, getstreamstatus,%
1846    gettemppath, getworldtransform, globals, glossmap, go, gotoframe,%
1847    gotonetmovie, gotonetpage, gradienttype, gravity, group, handler,%
1848    handlers, height, heightvertices, high, highlightpercentage,%
```

48

```
1849    highlightstrength, hilite, hither, hittest, hmstoframes, hold, hotspot,%
1850    html, hyperlink, hyperlinkclicked, hyperlinkrange, hyperlinks,%
1851    hyperlinkstate, id3tags, identity, idle, idlehandlerperiod,%
1852    idleloaddone, idleloadmode, idleloadperiod, idleloadtag,%
1853    idlereadchunksize, ilk, image, imagecompression, imageenabled,%
1854    imagequality, immovable, importfileinto, inflate, ink, inker,%
1855    inlineimeenabled, insertbackdrop, insertframe, insertoverlay, inside,%
1856    installmenu, instance, integer, integerp, interface, interpolate,%
1857    interpolateto, intersect, index, interval, inverse, invert, invertmask,%
1858    isbusy, isinworld, isoktoattach, ispastcuepoint, item, itemdelimiter,%
1859    kerning, kerningthreshold, key, keyboardfocussprite, keycode, keydown,%
1860    keydownscript, keyframeplayer, keypressed, keyup, keyupscript, label,%
1861    labellist, last, lastchannel, lastclick, lastevent, lastframe, lastkey,%
1862    lastroll, left, leftindent, length, lengthvertices, level, lifetime,%
1863    light, line, linearlist, linecolor, linecount, linedirection,%
1864    lineheight, lineoffset, linepostolocv, linesize, linkas, linked, list,%
1865    listp, loaded, loadfile, loc, loch, locked, locktranslation,%
1866    loctocharpos, locv, locvtolinepos, locz, lod, log, long, loop,%
1867    loopcount, loopendtime, loopsremaining, loopstarttime, machinetype,%
1868    magnitude, map, mapImageToStage, mapmembertostage, mapstagetomember,%
1869    margin, marker, markerlist, mask, max, maxinteger, maxspeed, mci,%
1870    media, mediaready, member, membernum, members, memorysize, menu, mesh,%
1871    meshdeform, milliseconds, min, minspeed, modal, mode, model, modela,%
1872    modelb, modelresource, modelsunderloc, modelsunderray, modelunderloc,%
1873    modified, modifiedby, modifieddate, modifier, modifiers, month,%
1874    mostrecentcuepoint, motion, mousechar, mousedown, mousedownscript,%
1875    mouseenter, mouseh, mouseitem, mouseleave, mouselevel, mouseline,%
1876    mouseloc, mousemember, mouseoverbutton, mouseup, mouseupoutside,%
1877    mouseupscript, mousev, mousewithin, mouseword, move, moveablesprite,%
1878    movetoback, movetofront, movevertex, movevertexhandle, movewindow,%
1879    movie, movieaboutinfo, moviecopyrightinfo, moviefilefreesize,%
1880    moviefilesize, moviefileversion, movieimagecompression,%
1881    movieimagequality, moviename, moviepath, movierate, movietime,%
1882    moviextralist, mpeglayer, multiply, multisound, name, near,%
1883    nearfiltering, neighbor, netabort, netdone, neterror, netlastmoddate,%
1884    netmime, netpresent, netstatus, nettextresult, netthrottleticks,%
1885    newcamera, newcurve, newgroup, newlight, newmesh, newmodel,%
1886    newmodelresource, newmotion, newshader, newtexture, next, none,%
1887    normalize, normallist, normals, nothing, notify, nudge, number,%
1888    numchannels, numparticles, numsegments, numtochar, objectp, offset,%
1889    open, openresfile, openwindow, openxlib, optiondown, organizationname,%
1890    originalfont, originh, originmode, originpoint, originv, orthoheight,%
1891    overlay, pageheight, palette, palettemapping, paletteref, paletteindex,%
1892    pan, paragraph, param, paramcount, parent, parsestring, particle,%
1893    pasteclipboardinto, path, pathname, pathstrength, pattern, pause,%
1894    pausedatstart, pausestate, percentplayed, percentstreamed, period,%
1895    perpendicularto, persistent, pi, picture, picturep, plane, platform,%
1896    play, playbackmode, playfile, playing, playlist, playnext, playrate,%
1897    point, pointat, pointatorientation, pointinhyperlink, pointofcontact,%
1898    pointtochar, pointtoitem, pointtoline, pointtoparagraph, pointtoword,%
```

```
1899    position, positionreset, posterframe, postnettext, power,%
1900    preferred3drenderer, preload, preloadbuffer, preloadeventabort,%
1901    preloadmember, preloadmode, preloadmovie, preloadnetthing, preloadram,%
1902    preloadtime, premultiply, prepareframe, preparemovie, prerotate,%
1903    prescale, pretranslate, previous, primitives, printfrom,%
1904    productversion, projection, projectionangle, propList, proxyserver,%
1905    pttohotspotid, puppet, puppetpalette, puppetsound, puppetsprite,%
1906    puppettempo, puppettransition, purgepriority, qtregisteraccesskey,%
1907    qtunregisteraccesskey, quad, quality, queue, quit, quote, radius,%
1908    ramneeded, random, randomseed, randomvector, rateshift, rawnew, read,%
1909    readvalue, recordfont, rect, ref, reflectionmap, reflectivity, region,%
1910    registerforevent, registerscript, regpoint, regpointvertex,%
1911    removebackdrop, removefromworld, removelast, removemodifier,%
1912    removeoverlay, rename, renderer, rendererdevicelist, renderformat,%
1913    renderstyle, resetworld, resizewindow, resolution, resolve, resolvea,%
1914    resolveb, resource, restart, resume, reverttoworlddefaults, rewind,%
1915    rgb, rgba4444, rgba5550, rgba5551, rgba5650, rgba8880, rgba8888, right,%
1916    rightindent, rightmousedown, rightmouseup, rollover, romanlingo,%
1917    rootlock, rootnode, rotate, rotation, rotationreset, rtf, runmode,%
1918    runpropertydialog, safeplayer, samplecount, samplerate, samplesize,%
1919    save, savedlocal, savemovie, scale, scalemode, score, scorecolor,%
1920    scoreselection, script, scriptexecutionstyle, scriptinstancelist,%
1921    scriptlist, scriptnum, scriptsenabled, scripttext, scripttype,%
1922    scrollbyline, scrollbypage, scrolltop, sds, searchcurrentfolder,%
1923    searchpath, searchpaths, seconds, selectedtext, selection, selend,%
1924    selstart, sendallsprites, sendevent, sendnetmessage, sendsprite,%
1925    serialnumber, setalpha, setaprop, setat, setcollisioncallback,%
1926    setflashproperty, setnetbufferlimits, setnetmessagehandler, setpixel,%
1927    setplaylist, setpref, setprop, setscriptlist, settrackenabled,%
1928    setvariable, shader, shaderlist, shadowpercentage, shadowstrength,%
1929    shapetype, shiftdown, shininess, shockwave3d, short, showglobals,%
1930    showlocals, showprops, showresfile, showxlib, shutdown, silhouettes,%
1931    sin, size, sizerange, skew, sleep, smoothness, sort, sound, soundbusy,%
1932    soundchannel, sounddevice, sounddevicelist, soundenabled,%
1933    soundkeepdevice, soundlevel, soundmixmedia, source, sourcerect, space,%
1934    specular, specularcolor, specularlightmap, sphere, spotangle,%
1935    spotdecay, sprite, spritenum, spritespacetoworldspace, sqrt, stage,%
1936    stagebottom, stagecolor, stageleft, stageright, stagetoflash, stagetop,%
1937    standard, startangle, startframe, startmovie, starttime, starttimer,%
1938    state, static, status, stepframe, stilldown, stop, stopevent,%
1939    stopmovie, stoptime, stream, streammode, streamname, streamsize,%
1940    streamstatus, string, stringp, strokecolor, strokewidth, style,%
1941    subdivision, sweep, swing, switchcolordepth, symbol, symbolp,%
1942    systemdate, tab, tabcount, tabs, tan, target, tellstreamstatus,%
1943    tension, text, texture, texturecoordinatelist, texturecoordinates,%
1944    texturelayer, texturelist, texturemember, texturemode, texturemodelist,%
1945    texturerenderformat, texturerepeat, texturerepeatlist,%
1946    texturetransform, texturetransformlist, texturetype, thumbnail, ticks,%
1947    tilt, time, timeout, timeouthandler, timeoutkeydown, timeoutlapsed,%
1948    timeoutlength, timeoutlist, timeoutmouse, timeoutplay, timeoutscript,%
```

```
1949    timer, timescale, title, titlevisible, toon, top, topcap, topradius,%
1950    topspacing, trace, traceload, tracelogfile, trackcount, trackenabled,%
1951    tracknextkeytime, tracknextsampletime, trackpreviouskeytime,%
1952    trackprevioussampletime, trackstarttime, trackstoptime, tracktext,%
1953    tracktype, trails, transform, transitiontype, translate,%
1954    triggercallback, trimwhitespace, tunneldepth, tweened, tweenmode, type,%
1955    [transparent], union, unload, unloadmember, unloadmovie,%
1956    unregisterallevents, update, updateframe, updatelock,%
1957    updatemovieenabled, updatestage, url, usealpha, usediffusewithtexture,%
1958    usefastquads, usehypertextstyles, uselineoffset, userdata, username,%
1959    value, vector, version, vertex, vertexlist, vertices, video,%
1960    videoforwindowspresent, viewh, viewpoint, viewscale, viewv, visibility,%
1961    visible, void, voidp, volume, volumeinfo, wait, waitfornetconnection,%
1962    warpmode, width, widthvertices, wind, window, windowlist,%
1963    windowpresent, windowtype, word, wordwrap, world, worldposition,%
1964    worldspacetospritespace, worldtransform, wraptransform,%
1965    wraptransformlist, write, writevalue, xaxis, xtra, xtralist, xtras,%
1966    yaxis, year, yon, zaxis, zoombox, zoomwindow, repeat, Conditional,%
1967    Boolean, TypeDef, Statement, Operator, String, Comment, Identifier,%
1968    Special, x, y, z},%
1969  sensitive=false,%
1970  morecomment=[l]{--},%
1971  morestring=[b]",%
1972 }[keywords,comments,strings]
1973 %    \begin{macrocode}
1974 ⟨/lang3⟩
```

2.37 Lisp, AutoLisp and Emacs Lisp (elisp)

Most data are from

- Guy Steele: **Common Lisp**; Copyright 1990 by Digital Equipment Corporation; ISBN 1-55558-042-4.

Thanks to Aslak Raanes for the 'single comment' delimiters. The keywords are the 'one-word' functions and macros of Common Lisp, i.e. words not containing a minus. But I left out the caaaar, ... functions. If anyone types them in, I'd like to get them. Hilmar Preuße informed about an issue mentioned at https://bugs.debian.org/499422, the issue got corrected.

```
1975 ⟨∗lang2⟩
```

```
1976 \lst@definelanguage{Lisp}%
1977   {morekeywords={abort,abs,acons,acos,acosh,adjoin,alphanumericp,alter,%
1978       append,apply,apropos,aref,arrayp,ash,asin,asinh,assoc,atan,atanh,%
1979       atom,bit,boole,boundp,break,butlast,byte,catenate,ceiling,cerror,%
1980       char,character,characterp,choose,chunk,cis,close,clrhash,coerce,%
1981       collect,commonp,compile,complement,complex,complexp,concatenate,%
1982       conjugate,cons,consp,constantp,continue,cos,cosh,cotruncate,%
1983       count,delete,denominator,describe,directory,disassemble,%
1984       documentation,dpb,dribble,ed,eighth,elt,enclose,endp,eq,eql,%
```

```
1985        equal,equalp,error,eval,evalhook,evenp,every,exp,expand,export,%
1986        expt,fboundp,fceiling,fdefinition,ffloor,fifth,fill,find,first,%
1987        float,floatp,floor,fmakunbound,format,fourth,fround,ftruncate,%
1988        funcall,functionp,gatherer,gcd,generator,gensym,gentemp,get,getf,%
1989        gethash,identity,imagpart,import,inspect,integerp,intern,%
1990        intersection,tively,isqrt,keywordp,last,latch,lcm,ldb,ldiff,%
1991        length,list,listen,listp,load,log,logand,logbitp,logcount,logeqv,%
1992        logior,lognand,lognor,lognot,logtest,logxor,macroexpand,%
1993        makunbound,map,mapc,mapcan,mapcar,mapcon,maphash,mapl,maplist,%
1994        mask,max,member,merge,min,mingle,minusp,mismatch,mod,namestring,%
1995        nbutlast,nconc,nintersection,ninth,not,notany,notevery,nreconc,%
1996        nreverse,nsublis,nsubst,nth,nthcdr,null,numberp,numerator,nunion,%
1997        oddp,open,packagep,pairlis,pathname,pathnamep,phase,plusp,%
1998        position,positions,pprint,previous,princ,print,proclaim,provide,%
1999        random,rassoc,rational,rationalize,rationalp,read,readtablep,%
2000        realp,realpart,reduce,rem,remhash,remove,remprop,replace,require,%
2001        rest,revappend,reverse,room,round,rplaca,rplacd,sbit,scan,schar,%
2002        search,second,series,set,seventh,shadow,signal,signum,sin,sinh,%
2003        sixth,sleep,some,sort,split,sqrt,streamp,string,stringp,sublis,%
2004        subseq,subseries,subsetp,subst,substitute,subtypep,svref,sxhash,%
2005        symbolp,tailp,tan,tanh,tenth,terpri,third,truename,truncate,%
2006        typep,unexport,unintern,union,until,values,vector,vectorp,warn,%
2007        write,zerop,and,assert,case,ccase,cond,ctypecase,decf,declaim,%
2008        defclass,defconstant,defgeneric,defmacro,defmethod,defpackage,%
2009        defparameter,defsetf,defstruct,deftype,defun,defvar,do,dolist,%
2010        dotimes,ecase,encapsulated,etypecase,flet,formatter,gathering,%
2011        incf,iterate,labels,let,locally,loop,macrolet,mapping,or,pop,%
2012        producing,prog,psetf,psetq,push,pushnew,remf,return,rotatef,%
2013        setf,shiftf,step,time,trace,typecase,unless,untrace,when},%
2014   sensitive=false,% ???
2015   alsodigit=-,%
2016   morecomment=[l];,%
2017   morecomment=[s]{\#|}{|\#},% 1997 Aslak Raanes
2018   morestring=[b]"%
2019  }[keywords,comments,strings]

2020 ⟨/lang2⟩

2021 ⟨*lang2⟩
```

Stefan Lagotzki warned me to define this as a lisp dialect …

```
2022 %%
2023 %% AutoLISP/VisualLISP - Stefan Lagotzki, info@lagotzki.de
2024 %%
2025 \lst@definelanguage[Auto]{Lisp}%
2026   {morekeywords={abs,acad_colordlg,acad_helpdlg,acad_strlsort,%
2027        action_tile,add_list,alert,alloc,and,angle,angtof,angtos,append,%
2028        apply,arx,arxload,arxunload,ascii,assoc,atan,atof,atoi,atom,%
2029        atoms-family,autoarxload,autoload,Boole,boundp,caddr,cadr,car,%
2030        cdr,chr,client_data_tile,close,command,cond,cons,cos,cvunit,%
2031        defun,defun-q,defun-q-list-ref,defun-q-list-set,dictadd,dictnext,%
```

```
2032    dictremove,dictrename,dictsearch,dimx_tile,dimy_tile,distance,%
2033    distof,done_dialog,end_image,end_list,entdel,entget,entlast,%
2034    entmake,entmakex,entmod,entnext,entsel,entupd,eq,equal,*error*,%
2035    eval,exit,exp,expand,expt,fill_image,findfile,fix,float,foreach,%
2036    function,gc,gcd,get_attr,get_tile,getangle,getcfg,getcname,%
2037    getcorner,getdist,getenv,getfiled,getint,getkword,getorient,%
2038    getpoint,getreal,getstring,getvar,graphscr,grclear,grdraw,grread,%
2039    grtext,grvecs,handent,help,if,initdia,initget,inters,itoa,lambda,%
2040    last,layoutlist,length,list,listp,load,load_dialog,log,logand,%
2041    logior,lsh,mapcar,max,mem,member,menucmd,menugroup,min,minusp,%
2042    mode_tile,namedobjdict,nentsel,nentselp,new_dialog,not,nth,%
2043    null,numberp,open,or,osnap,polar,prin1,princ,print,progn,prompt,%
2044    quit,quote,read,read-char,read-line,redraw,regapp,rem,repeat,%
2045    reverse,rtos,set,set_tile,setcfg,setenv,setfunhelp,setq,%
2046    setvar,setview,sin,slide_image,snvalid,sqrt,ssadd,ssdel,ssget,%
2047    ssgetfirst,sslength,ssmemb,ssname,ssnamex,sssetfirst,startapp,%
2048    start_dialog,start_image,start_list,strcase,strcat,strlen,subst,%
2049    substr,tablet,tblnext,tblobjname,tblsearch,term_dialog,terpri,%
2050    textbox,textpage,textscr,trace,trans,type,unload_dialog,untrace,%
2051    vector_image,ver,vl-acad-defun,vl-acad-undefun,vl-arx-import,%
2052    vl-bb-ref,vl-bb-set,vl-catch-all-apply,%
2053    vl-catch-all-error-message,vl-catch-all-error-p,vl-cmdf,vl-consp,%
2054    vl-directory-files,vl-doc-export,vl-doc-import,vl-doc-ref,%
2055    vl-doc-set,vl-every,vl-exit-with-error,vl-exit-with-value,%
2056    vl-file-copy,vl-file-delete,vl-file-directory-p,vl-file-rename,%
2057    vl-file-size,vl-file-systime,vl-filename-base,%
2058    vl-filename-directory,vl-filename-extension,vl-filename-mktemp,%
2059    vl-get-resource,vl-list*,vl-list->string,%
2060    vl-list-exported-functions,vl-list-length,vl-list-loaded-vlx,%
2061    vl-load-all,vl-load-com,vl-load-reactors,vl-member-if,%
2062    vl-member-if-not,vl-position,vl-prin1-to-string,%
2063    vl-princ-to-string,vl-propagate,vl-registry-delete,%
2064    vl-registry-descendents,vl-registry-read,vl-registry-write,%
2065    vl-remove,vl-remove-if,vl-remove-if-not,vl-some,vl-sort,%
2066    vl-sort-i,vl-string->list,vl-string-elt,vl-string-left-trim,%
2067    vl-string-mismatch,vl-string-position,vl-string-right-trim,%
2068    vl-string-search,vl-string-subst,vl-string-translate,%
2069    vl-string-trim,vl-symbol-name,vl-symbol-value,vl-symbolp,%
2070    vl-unload-vlx,vl-vbaload,vl-vbarun,vl-vlx-loaded-p,vlax-3D-point,%
2071    vlax-add-cmd,vlax-create-object,vlax-curve-getArea,%
2072    vlax-curve-getDistAtParam,vlax-curve-getDistAtPoint,%
2073    vlax-curve-getEndParam,vlax-curve-getEndPoint,%
2074    vlax-curve-getParamAtDist,vlax-curve-getParamAtPoint,%
2075    vlax-curve-getPointAtDist,vlax-curve-getPointAtParam,%
2076    vlax-curve-getStartParam,vlax-curve-getStartPoint,%
2077    vlax-curve-isClosed,vlax-curve-isPeriodic,vlax-curve-isPlanar,%
2078    vlax-curve-getClosestPointTo,%
2079    vlax-curve-getClosestPointToProjection,vlax-curve-getFirstDeriv,%
2080    vlax-curve-getSecondDeriv,vlax-dump-object,%
2081    vlax-ename->vla-object,vlax-erased-p,vlax-for,%
```

```
2082        vlax-get-acad-object,vlax-get-object,vlax-get-or-create-object,%
2083        vlax-get-property,vlax-import-type-library,vlax-invoke-method,%
2084        vlax-ldata-delete,vlax-ldata-get,vlax-ldata-list,vlax-ldata-put,%
2085        vlax-ldata-test,vlax-make-safearray,vlax-make-variant,%
2086        vlax-map-collection,vlax-method-applicable-p,%
2087        vlax-object-released-p,vlax-product-key,%
2088        vlax-property-available-p,vlax-put-property,vlax-read-enabled-p,%
2089        vlax-release-object,vlax-remove-cmd,vlax-safearray-fill,%
2090        vlax-safearray-get-dim,vlax-safearray-get-element,%
2091        vlax-safearray-get-l-bound,vlax-safearray-get-u-bound,%
2092        vlax-safearray-put-element,vlax-safearray-type,%
2093        vlax-safearray->list,vlax-tmatrix,vlax-typeinfo-available-p,%
2094        vlax-variant-change-type,vlax-variant-type,vlax-variant-value,%
2095        vlax-vla-object->ename,vlax-write-enabled-p,vlisp-compile,%
2096        vlr-acdb-reactor,vlr-add,vlr-added-p,vlr-beep-reaction,%
2097        vlr-command-reactor,vlr-current-reaction-name,vlr-data,%
2098        vlr-data-set,vlr-deepclone-reactor,vlr-docmanager-reactor,%
2099        vlr-dwg-reactor,vlr-dxf-reactor,vlr-editor-reactor,%
2100        vlr-insert-reactor,vlr-linker-reactor,vlr-lisp-reactor,%
2101        vlr-miscellaneous-reactor,vlr-mouse-reactor,vlr-notification,%
2102        vlr-object-reactor,vlr-owner-add,vlr-owner-remove,vlr-owners,%
2103        vlr-pers,vlr-pers-list,vlr-pers-p,vlr-pers-release,%
2104        vlr-reaction-names,vlr-reaction-set,vlr-reactions,vlr-reactors,%
2105        vlr-remove,vlr-remove-all,vlr-set-notification,%
2106        vlr-sysvar-reactor,vlr-toolbar-reactor,vlr-trace-reaction,%
2107        vlr-type,vlr-types,vlr-undo-reactor,vlr-wblock-reactor,%
2108        vlr-window-reactor,vlr-xref-reactor,vports,wcmatch,while,%
2109        write-char,write-line,xdroom,xdsize,zerop},%
2110     alsodigit=->,%
2111     otherkeywords={1+,1-},%
2112     sensitive=false,%
2113     morecomment=[l];,%
2114     morecomment=[l];;,%
2115     morestring=[b]"%
2116    }[keywords,comments,strings]

2117 ⟨/lang2⟩

2118 ⟨∗lang2⟩
```

A first approch to elisp by one of the maintainers (Jobst Hoffmann), it is far away from completeness, the list of keywords is defined according the to the needs of the maintainer...

```
2119 \lst@definelanguage{elisp}[]{Lisp}{%
2120   morekeywords={begin, car, cdr, cons, define, display, drop, filter,%
2121     hash-ref, hash-set, if, load-file, lambda, length, map, message,%
2122     progn, quote, require, setq, string-append, take, vector,%
2123   },%
2124   sensitive,%
2125   alsodigit=->,%
2126   otherkeywords={1+,1-},%
```

```
2127   sensitive=true,%
2128   morecomment=[l];,%
2129   morecomment=[l];;,%
2130   morestring=[b]"%
2131 }[keywords,comments,strings]

2132 ⟨/lang2⟩
```

2.38   LLVM

LLVM provides a collection of modular and reusable compiler and toolchain technologies, all further information can be found at its home page <http://llvm.org/>. Scott Pakin provided a language definition for the LLVM intermediate presentation according to <http://llvm.org/docs/>.[2] The language provides

```
2133 ⟨∗lang3⟩

2134 \lst@definelanguage{LLVM}{%
2135   morekeywords={%
```

- Instructions

```
2136         ret,br,switch,indirectbr,invoke,resume,unreachable,%
2137         add,fadd,sub,fsub,mul,fmul,udiv,sdiv,fdiv,urem,srem,frem,%
2138         shl,lshr,ashr,and,or,xor,%
2139         extractelement,insertelement,shufflevector,%
2140         extractvalue,insertvalue,%
2141         alloca,load,store,fence,cmpxchg,atomicrmw,getelementptr,%
2142         trunc,zext,sext,fptrunc,fpext,fptoui,fptosi,uitofp,sitofp,ptrtoint,%
2143         inttoptr,bitcast,to,%
2144         icmp,fcmp,phi,select,call,va_arg,landingpad,%
```

- Atomic operations – some duplication with the above

```
2145         xchg,add,sub,and,nand,or,xor,max,min,umax,umin,%
```

- Comparisons

```
2146         eq,ne,ugt,uge,ult,ule,sgt,sge,slt,sle,%
2147         false,oeq,ogt,oge,olt,ole,one,ord,ueq,ugt,uge,ult,ule,une,uno,true,%
```

- Linkage types

```
2148         private,linker_private,linker_private_weak,linker_private_weak_def_auto,%
2149         internal,available_externally,linkonce,common,weak,appending,extern_weak,%
2150         linkonce_odr,weak_odr,external,dllimport,dllexport,%
```

- Function headers

```
2151         define,declare,%
```

- Parameter attributes

```
2152         zeroext,signext,inreg,byval,sret,noalias,nocapture,next,%
```

---

[2]In this section 'I' is Scott Pakin.

- Garbage collector names

```
2153        gc,%
```

- Function attributes

```
2154        address_safety,alignstack,alwaysinline,nonlazybind,inlinehint,naked,%
2155        noimplicitfloat,noinline,noredzone,noreturn,nounwind,optsize,readnone,%
2156        readonly,returns_twice,ssp,sspreq,uwtable,%
```

- Module-level inline assembly

```
2157        module,asm,%
```

- Data layout

```
2158        target,datalayout,%
```

- Inline assembler expressions

```
2159        sideeffect,alignstack,%
```

- Other keywords – I'm probably missing some here.

```
2160        nuw,nsw,exact,inbounds,unnamed_addr},%
2161      morekeywords=[2]{%
```

- Types

```
2162        i1,i2,i4,i8,i16,i32,i64,i128,i256,i512,i1024,% <-- Most common integers
2163        half,float,double,x86_fp80,fp128,ppc_fp128,x86mmx,%
2164        void,label,metadata},%
2165      alsoletter=.,%
2166      sensitive=false,%
2167      morecomment=[l];,%
2168      morestring=[b]"%
2169    }
```

```
2170 ⟨/lang3⟩
```

2.39   Logo

I don't know where the keywords are from and what kind of Logo it is. Help me!

```
2171 ⟨∗lang3⟩
```

```
2172 \lst@definelanguage{Logo}%
2173 % ??? {end,unix} also keywords
2174   {morekeywords={and,atan,arctan,both,break,bf,bl,butfirst,butlast,%
2175      cbreak, close,co,continue,cos,count,clearscreen,cs,debquit,%
2176      describe,diff,difference,ed,edit,either,emptyp,equalp,er,erase,%
2177      errpause,errquit,fifp,filefprint,fifty,fileftype,fip,fileprint,%
2178      fird,fileread,fity,filetype,fiwd,fileword,f,first,or,fp,fprint,%
2179      fput,fty,ftype,full,fullscreen,go,bye,goodbye,gprop,greaterp,%
2180      help,if,iff,iffalse,ift,iftrue,nth,item,keyp,llast,lessp,list,%
```

```
2181        local,lput,make,max,maximum,memberp,memtrace,min,minimum,namep,%
2182        not,numberp,oflush,openr,openread,openw,openwrite,op,output,%
2183        pause,plist,pots,pow,pprop,pps,pr,print,product,quotient,random,%
2184        rc,readchar,rl,readlist,remprop,repcount,repeat,request,rnd,run,%
2185        se,sentence,sentencep,setc,setcolor,setipause,setqpause,po,show,%
2186        sin,split,splitscreen,sqrt,stop,sum,test,text,textscreen,thing,%
2187        to,tone,top,toplevel,type,untrace,wait,word,wordp,yaccdebug,is,%
2188        mod,remainder,trace,zerop,back,bk,bto,btouch,fd,forward,fto,%
2189        ftouch,getpen,heading,hit,hitoot,ht,hideturtle,loff,lampoff,lon,%
2190        lampon,lt,left,lot,lotoot,lto,ltouch,penc,pencolor,pd,pendown,pe,%
2191        penerase,penmode,pu,penup,px,penreverse,rt,right,rto,rtouch,%
2192        scrunch,seth,setheading,setscrun,setscrunch,setxy,shownp,st,%
2193        showturtle,towardsxy,clean,wipeclean,xcor,ycor,tur,turtle,%
2194        display,dpy},%
2195   sensitive=f% ???
2196   }[keywords]%
```

2197 ⟨/lang3⟩

2.40   Lua

Stephan Hennig contributed the Lua keywords.

2198 ⟨∗lang2⟩

We begin with the keywords for Lua 5.0:

```
2199 %%
2200 %% Lua definitions (c) 2013 Stephan Hennig
2201 %%
2202 \lst@definelanguage[5.0]{Lua}{%
```

To enable highlighting of library keywords, the dot needs to be a letter.

```
2203   alsoletter={.},%
```

The language definition knows

- language keywords

```
2204        morekeywords=[1]{%
2205          and, break, do, else, elseif, end, false, for, function, if, in,%
2206          local, nil, not, or, repeat, return, then, true, until, while,%
2207        },%
```

- the standard library identifiers

```
2208        morekeywords=[2]{%
```

  – coming from the base library

```
2209             _G, _LOADED, _REQUIREDNAME, _VERSION, LUA_PATH,%
2210             assert, collectgarbage, dofile, error, gcinfo, getfenv,%
2211             getmetatable, ipairs, loadfile, loadlib, loadstring, newproxy,%
2212             next, pairs, pcall, print, rawequal, rawget, rawset, require,%
2213             setfenv, setmetatable, tonumber, tostring, type, unpack, xpcall,%
```

− coming from the coroutine library

```
2214                coroutine, coroutine.create, coroutine.resume,%
2215                coroutine.status, coroutine.wrap, coroutine.yield,%
```

− the debug library

```
2216                _TRACEBACK, debug, debug.debug, debug.gethook, debug.getinfo,%
2217                debug.getlocal, debug.getupvalue, debug.sethook, debug.setlocal,%
2218                debug.setupvalue,debug.traceback,%
```

− the io library

```
2219                io, io.close, io.flush, io.input, io.lines, io.open, io.output,%
2220                io.popen, io.read, io.stderr, io.stdin, io.stdout, io.tmpfile,%
2221                io.type, io.write,%
```

− the mathematical library

```
2222                __pow, math, math.abs, math.acos, math.asin, math.atan, math.atan2,%
2223                math.ceil, math.cos, math.deg, math.exp, math.floor, math.frexp,%
2224                math.ldexp, math.log, math.log10, math.max, math.min, math.mod,%
2225                math.pi, math.pow, math.rad, math.random, math.randomseed, math.sin,%
2226                math.sqrt, math.tan,%
```

− the os library

```
2227                os, os.clock, os.date, os.difftime, os.execute, os.exit, os.getenv,%
2228                os.remove, os.rename, os.setlocale, os.time, os.tmpname,%
```

− the string library

```
2229                string, string.byte, string.char, string.dump, string.find,%
2230                string.format, string.gfind, string.gsub, string.len, string.lower,%
2231                string.rep, string.sub, string.upper,%
```

− the table library

```
2232                table, table.concat, table.foreach, table.foreachi, table.getn,%
2233                table.insert, table.remove, table.setn, table.sort,%
2234             },%
```

and some additional identifiers

```
2235    morekeywords=[2]{%
2236      _PROMPT, _PROMPT2, arg,%
2237    },%
```

These are the common language settings

```
2238    sensitive=true,%
2239    % single line comments
2240    morecomment=[l]{--},%
2241    % multi line comments
2242    morecomment=[s]{--[[}{]]},%
2243    % backslash escaped strings
2244    morestring=[b]",%
2245    morestring=[b]',%
2246    % multi line strings
2247    morestring=[s]{[[}{]]},%
2248 }[keywords,comments,strings]
```

58

And here are the new definitions for Lua 5.1:

```
2249 \lst@definelanguage[5.1]{Lua}[5.0]{Lua}{%
```

There are some deletions

```
2250   deletekeywords=[2]{%
```

concerning

- the base library

```
2251         _LOADED, _REQUIREDNAME, LUA_PATH, gcinfo, loadlib,%
```

- the debug library

```
2252         _TRACEBACK,%
```

- the mathematical library

```
2253         __pow, math.mod,%
```

- the string library

```
2254         string.gfind,%
```

- the table library

```
2255         table.foreach, table.foreachi, table.getn, table.setn,%
2256       },%
```

and some new identifiers in standard libraries like

```
2257   morekeywords=[2]{%
```

- the base library

```
2258         load, select,%
```

- coroutine library

```
2259         coroutine.running,%
```

- debug library

```
2260         debug.getfenv, debug.getmetatable, debug.getregistry, debug.setfenv,%
2261         debug.setmetatable,%
```

- the mathematical library

```
2262         math.cosh, math.fmod, math.huge, math.modf, math.sinh, math.tanh,%
```

- the package library which itself is new in Lua 5.1

```
2263         module, package, package.config, package.cpath, package.loaded,%
2264         package.loaders, package.loadlib, package.path, package.preload,%
2265         package.seeall,%
```

- the string library and

```
2266         string.gmatch, string.match, string.reverse,%
```

- the table library

```
2267        table.maxn,%
2268      },%
```

In Lua 5.1 long bracket comments were introduced also

```
2269   morecomment=[s]{--[=[}{]=]},%
2270   morecomment=[s]{--[==[}{]==]},%
2271   morecomment=[s]{--[===[}{]===]},%
2272   morecomment=[s]{--[====[}{]====]},%
2273   morecomment=[s]{--[=====[}{]=====]},%
2274   morecomment=[s]{--[======[}{]======]},%
2275   morecomment=[s]{--[=======[}{]=======]},%
2276   morecomment=[s]{--[========[}{]========]},%
2277   morecomment=[s]{--[=========[}{]=========]},%
2278   morecomment=[s]{--[==========[}{]==========]},%
```

as well as long bracket strings

```
2279   morestring=[s]{[=[}{]=]},%
2280   morestring=[s]{[==[}{]==]},%
2281   morestring=[s]{[===[}{]===]},%
2282   morestring=[s]{[====[}{]====]},%
2283   morestring=[s]{[=====[}{]=====]},%
2284   morestring=[s]{[======[}{]======]},%
2285   morestring=[s]{[=======[}{]=======]},%
2286   morestring=[s]{[========[}{]========]},%
2287   morestring=[s]{[=========[}{]=========]},%
2288   morestring=[s]{[==========[}{]==========]},%
2289 }[keywords,comments,strings]
```

Lua 5.2 again has some changed features. These are

```
2290 \lst@definelanguage[5.2]{Lua}[5.1]{Lua}{%
```

- new language keywords

```
2291        morekeywords=[1]{%
2292          goto,%
2293        },%
```

- deleted identifiers from the standard libraries like

```
2294        deletekeywords=[2]{%
```

  - the base library

```
2295            getfenv, loadstring, module, newproxy, setfenv, unpack,%
```

  - the debug library

```
2296            debug.getfenv, debug.setfenv,%
```

  - the mathematical library

```
2297            math.log10,%
```

- the package library and

```
2298            package.loaders, package.seeall,%
```

- the table library

```
2299            table.maxn,%
2300          },%
```

Again there are some new identifiers in the standard libraries

```
2301   morekeywords=[2]{%
```

like

- the base library

```
2302        rawlen,%
```

- the bit library

```
2303        bit32, bit32.arshift, bit32.band, bit32.bnot, bit32.bor,%
2304        bit32.btest, bit32.bxor, bit32.extract, bit32.lrotate,%
2305        bit32.lshift, bit32.replace, bit32.rrotate, bit32.rshift,%
```

- the debug library

```
2306        debug.getuservalue, debug.setuservalue, debug.upvalueid,%
2307        debug.upvaluejoin,%
```

- the package library

```
2308        package.searchers, package.searchpath,%
```

- the table library

```
2309        table.pack, table.unpack,%
2310      },%
```

There is a new additional identifier

```
2311   morekeywords=[2]{%
2312    _ENV,%
2313   },%
```

and labels are also new in Lua 5.2

```
2314   moredelim=[s][keywordstyle3]{::}{::},%
2315 }[keywords,comments,strings]
```

In January 2015 Lua 5.3 was released, Stephan Hennig again contributed the Lua keywords.

```
2316 \lst@definelanguage[5.3]{Lua}[5.2]{Lua}{%
```

- some libraries are deprecated, so the following identifiers are deleted

```
2317        deletekeywords=[2]{%
```

— the `bit32` library

```
2318            bit32, bit32.arshift, bit32.band, bit32.bnot, bit32.bor,%
2319            bit32.btest, bit32.bxor, bit32.extract, bit32.lrotate,%
2320            bit32.lshift, bit32.replace, bit32.rrotate, bit32.rshift,%
```

— the mathematical library

```
2321            math.atan2, math.cosh, math.frexp, math.ldexp, math.pow,%
2322            math.sinh, math.tanh,%
2323          },%
```

Again there are some new identifiers in the standard libraries

```
2324   morekeywords=[2]{%
```

like

- the coroutine library

```
2325          coroutine.isyieldable,%
```

- the mathematical library

```
2326          math.maxinteger, math.mininteger, math.tointeger, math.type,%
2327          math.ult,%
```

- the string library

```
2328          string.pack, string.packsize, string.unpack,%
```

- the table library

```
2329          table.move,%
```

- the utf-8 library

```
2330          utf8, utf8.char, utf8.charpattern, utf8.codepoint, utf8.codes,%
2331          utf8.len, utf8.offset,%
2332        },%
2333      }[keywords,comments,strings]
```

```
2334      ⟨/lang2⟩
```

Stephan Hennig also supplied a definition of a style for printing Lua code:

```
2335 ⟨∗lua-prf⟩
```

```
2336 \usepackage[rgb, x11names]{xcolor}
2337 \lstdefinestyle{Lua}{%
2338   language=[5.2]Lua,
2339   basicstyle=\ttfamily,
2340   columns=spaceflexible,
2341   keywordstyle=\bfseries\color{Blue4},% language keywords
2342   keywordstyle=[2]\bfseries\color{RoyalBlue3},% std. library identifiers
2343   keywordstyle=[3]\bfseries\color{Purple3},% labels
2344   stringstyle=\bfseries\color{Coral4},% strings
2345   commentstyle=\itshape\color{Green4},% comments
2346 }
```

This code is provided in the file `listings-lua.prf`, see section 2.4.1 (Preferences) of the listings documentation.

2347 ⟨/lua-prf⟩

2.41 Make

Rolf Niepraschk sent me the new definitions. Markus Pahlow found a missing comma and added some keywords, which improve the highlighting with `makemacrouse=true` (but I haven't tested this).

2348 ⟨*lang2⟩

```
2349 %%
2350 %% Make definitions (c) 2000 Rolf Niepraschk
2351 %%
2352 \lst@definelanguage[gnu]{make}%
2353   {morekeywords={SHELL,MAKE,MAKEFLAGS,$@,$\%,$<,$?,$^,$+,$*,%
2354       @,^,<,\%,+,?,*,% Markus Pahlow
2355       export,unexport,include,override,define,ifdef,ifneq,ifeq,else,%
2356       endif,vpath,subst,patsubst,strip,findstring,filter,filter-out,%
2357       sort,dir,notdir,suffix,basename,addsuffix,addprefix,join,word,%
2358       words,firstword,wildcard,shell,origin,foreach,%
2359       @D,@F,*D,*F,\%D,\%F,<D,<F,^D,^F,+D,+F,?D,?F,%
2360       AR,AS,CC,CXX,CO,CPP,FC,GET,LEX,PC,YACC,YACCR,MAKEINFO,TEXI2DVI,%
2361       WEAVE,CWEAVE,TANGLE,CTANGLE,RM,M2C,LINT,COMPILE,LINK,PREPROCESS,%
2362       CHECKOUT,%
2363       ARFLAGS,ASFLAGS,CFLAGS,CXXFLAGS,COFLAGS,CPPFLAGS,FFLAGS,GFLAGS,%
2364       LDFLAGS,LOADLIBES,LFLAGS,PFLAGS,RFLAGS,YFLAGS,M2FLAGS,MODFLAGS,%
2365       LINTFLAGS,MAKEINFO_FLAGS,TEXI2DVI_FLAGS,COFLAGS,GFLAGS,%
2366       OUTPUT_OPTION,SCCS_OUTPUT_OPTION,% missing comma: Markus Pahlow
2367       .PHONY,.SUFFIXES,.DEFAULT,.PRECIOUS,.INTERMEDIATE,.SECONDARY,%
2368       .IGNORE,.SILENT,.EXPORT_ALL_VARIABLES,MAKEFILES,VPATH,MAKESHELL,%
2369       MAKELEVEL,MAKECMDGOALS,SUFFIXES},%
2370     sensitive=true,
2371     morecomment=[l]\#,%
2372     morestring=[b]"%
2373   }[keywords,comments,strings,make]%

2374 \lst@definelanguage{make}
2375   {morekeywords={SHELL,MAKE,MAKEFLAGS,$@,$\%,$<,$?,$^,$+,$*},%
2376     sensitive=true,%
2377     morecomment=[l]\#,%
2378     morestring=[b]"%
2379   }[keywords,comments,strings,make]%
```

The two `[b]`-arguments have been added after a bug report by Dr. Jobst Hoffmann

2380 ⟨/lang2⟩

2.42 Matlab

I (C. H.?) took the keywords from `http://www.utexas.edu/math/Matlab/Manual`, but I removed the keywords `i`, `j` and `tmp`—the change was proposed by Kai Below.

2381 ⟨∗lang1⟩

From the revision history one can conclude that "Matlab´´ means "Matlab 5.1´´ which was released in 1997

```
2382 \lst@definelanguage[5.1]{Matlab}[]{Matlab}{}

2383 \lst@definelanguage{Matlab}%
2384     {morekeywords={gt,lt,gt,lt,amp,abs,acos,acosh,acot,acoth,acsc,acsch,%
2385         all,angle,ans,any,asec,asech,asin,asinh,atan,atan2,atanh,auread,%
2386         auwrite,axes,axis,balance,bar,bessel,besselk,bessely,beta,%
2387         betainc,betaln,blanks,bone,break,brighten,capture,cart2pol,%
2388         cart2sph,caxis,cd,cdf2rdf,cedit,ceil,chol,cla,clabel,clc,clear,%
2389         clf,clock,close,colmmd,Colon,colorbar,colormap,ColorSpec,colperm,%
2390         comet,comet3,compan,compass,computer,cond,condest,conj,contour,%
2391         contour3,contourc,contrast,conv,conv2,cool,copper,corrcoef,cos,%
2392         cosh,cot,coth,cov,cplxpair,cputime,cross,csc,csch,csvread,%
2393         csvwrite,cumprod,cumsum,cylinder,date,dbclear,dbcont,dbdown,%
2394         dbquit,dbstack,dbstatus,dbstep,dbstop,dbtype,dbup,ddeadv,ddeexec,%
2395         ddeinit,ddepoke,ddereq,ddeterm,ddeunadv,deblank,dec2hex,deconv,%
2396         del2,delete,demo,det,diag,diary,diff,diffuse,dir,disp,dlmread,%
2397         dlmwrite,dmperm,dot,drawnow,echo,eig,ellipj,ellipke,else,elseif,%
2398         end,engClose,engEvalString,engGetFull,engGetMatrix,engOpen,%
2399         engOutputBuffer,engPutFull,engPutMatrix,engSetEvalCallback,%
2400         engSetEvalTimeout,engWinInit,eps,erf,erfc,erfcx,erfinv,error,%
2401         errorbar,etime,etree,eval,exist,exp,expint,expm,expo,eye,fclose,%
2402         feather,feof,ferror,feval,fft,fft2,fftshift,fgetl,fgets,figure,%
2403         fill,fill3,filter,filter2,find,findstr,finite,fix,flag,fliplr,%
2404         flipud,floor,flops,fmin,fmins,fopen,for,format,fplot,fprintf,%
2405         fread,frewind,fscanf,fseek,ftell,full,function,funm,fwrite,fzero,%
2406         gallery,gamma,gammainc,gammaln,gca,gcd,gcf,gco,get,getenv,%
2407         getframe,ginput,global,gplot,gradient,gray,graymon,grid,griddata,%
2408         gtext,hadamard,hankel,help,hess,hex2dec,hex2num,hidden,hilb,hist,%
2409         hold,home,hostid,hot,hsv,hsv2rgb,if,ifft,ifft2,imag,image,%
2410         imagesc,Inf,info,input,int2str,interp1,interp2,interpft,inv,%
2411         invhilb,isempty,isglobal,ishold,isieee,isinf,isletter,isnan,%
2412         isreal,isspace,issparse,isstr,jet,keyboard,kron,lasterr,lcm,%
2413         legend,legendre,length,lin2mu,line,linspace,load,log,log10,log2,%
2414         loglog,logm,logspace,lookfor,lower,ls,lscov,lu,magic,matClose,%
2415         matDeleteMatrix,matGetDir,matGetFp,matGetFull,matGetMatrix,%
2416         matGetNextMatrix,matGetString,matlabrc,matlabroot,matOpen,%
2417         matPutFull,matPutMatrix,matPutString,max,mean,median,menu,mesh,%
2418         meshc,meshgrid,meshz,mexAtExit,mexCallMATLAB,mexdebug,%
2419         mexErrMsgTxt,mexEvalString,mexFunction,mexGetFull,mexGetMatrix,%
2420         mexGetMatrixPtr,mexPrintf,mexPutFull,mexPutMatrix,mexSetTrapFlag,%
2421         min,more,movie,moviein,mu2lin,mxCalloc,mxCopyCharacterToPtr,%
2422         mxCopyComplex16ToPtr,mxCopyInteger4ToPtr,mxCopyPtrToCharacter,%
2423         mxCopyPtrToComplex16,mxCopyPtrToInteger4,mxCopyPtrToReal8,%
```

```
2424        mxCopyReal8ToPtr,mxCreateFull,mxCreateSparse,mxCreateString,%
2425        mxFree,mxFreeMatrix,mxGetIr,mxGetJc,mxGetM,mxGetN,mxGetName,%
2426        mxGetNzmax,mxGetPi,mxGetPr,mxGetScalar,mxGetString,mxIsComplex,%
2427        mxIsFull,mxIsNumeric,mxIsSparse,mxIsString,mxIsTypeDouble,%
2428        mxSetIr,mxSetJc,mxSetM,mxSetN,mxSetName,mxSetNzmax,mxSetPi,%
2429        mxSetPr,NaN,nargchk,nargin,nargout,newplot,nextpow2,nnls,nnz,%
2430        nonzeros,norm,normest,null,num2str,nzmax,ode23,ode45,orient,orth,%
2431        pack,pascal,patch,path,pause,pcolor,pi,pink,pinv,plot,plot3,%
2432        pol2cart,polar,poly,polyder,polyeig,polyfit,polyval,polyvalm,%
2433        pow2,print,printopt,prism,prod,pwd,qr,qrdelete,qrinsert,quad,%
2434        quad8,quit,quiver,qz,rand,randn,randperm,rank,rat,rats,rbbox,%
2435        rcond,real,realmax,realmin,refresh,rem,reset,reshape,residue,%
2436        return,rgb2hsv,rgbplot,rootobject,roots,rose,rosser,rot90,rotate,%
2437        round,rref,rrefmovie,rsf2csf,save,saxis,schur,sec,sech,semilogx,%
2438        semilogy,set,setstr,shading,sign,sin,sinh,size,slice,sort,sound,%
2439        spalloc,sparse,spaugment,spconvert,spdiags,specular,speye,spfun,%
2440        sph2cart,sphere,spinmap,spline,spones,spparms,sprandn,sprandsym,%
2441        sprank,sprintf,spy,sqrt,sqrtm,sscanf,stairs,startup,std,stem,%
2442        str2mat,str2num,strcmp,strings,strrep,strtok,subplot,subscribe,%
2443        subspace,sum,surf,surface,surfc,surfl,surfnorm,svd,symbfact,%
2444        symmmd,symrcm,tan,tanh,tempdir,tempname,terminal,text,tic,title,%
2445        toc,toeplitz,trace,trapz,tril,triu,type,uicontrol,uigetfile,%
2446        uimenu,uiputfile,unix,unwrap,upper,vander,ver,version,view,%
2447        viewmtx,waitforbuttonpress,waterfall,wavread,wavwrite,what,%
2448        whatsnew,which,while,white,whitebg,who,whos,wilkinson,wk1read,%
2449        wk1write,xlabel,xor,ylabel,zeros,zlabel,zoom},%
2450      sensitive,%
2451      morecomment=[l]\%,%
2452      morestring=[m]'%
2453    }[keywords,comments,strings]

2454 ⟨/lang1⟩
```

2.43 Mathematica

Michael Wiese typed in all the keywords for the 1.0 and 3.0 versions. Oliver Ruebenkoenig wrote a script to generate the lists for the 5.2 version. Simon Pearce provided the list of keywords for Mathematica 11.0.

```
2455 ⟨*lang1⟩

2456 \lst@definelanguage[11.0]{Mathematica}[5.2]{Mathematica}{%
2457   morekeywords={
2458     "AASTriangle", "AbelianGroup", "Abort", "AbortKernels",%
2459     "AbortProtect", "AbortScheduledTask", "Above", "Abs", "AbsArg",%
2460     "Absolute", "AbsoluteCorrelation", "AbsoluteCorrelationFunction",%
2461     "AbsoluteCurrentValue", "AbsoluteDashing", "AbsoluteFileName",%
2462     "AbsoluteOptions", "AbsolutePointSize", "AbsoluteThickness",%
2463     "AbsoluteTime", "AbsoluteTiming", "AccountingForm", "Accumulate",%
2464     "Accuracy", "AccuracyGoal", "ActionDelay", "ActionMenu",%
2465     "ActionMenuBox", "ActionMenuBoxOptions", "Activate", "Active",%
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2466        "ActiveItem", "ActiveStyle", "AcyclicGraphQ", "AddOnHelpPath",%
2467        "AddTo", "AddUsers", "AdjacencyGraph", "AdjacencyList",%
2468        "AdjacencyMatrix", "AdjustmentBox", "AdjustmentBoxOptions",%
2469        "AdjustTimeSeriesForecast", "AdministrativeDivisionData",%
2470        "AffineHalfSpace", "AffineSpace", "AffineStateSpaceModel",%
2471        "AffineTransform", "After", "AircraftData", "AirportData",%
2472        "AirPressureData", "AirTemperatureData", "AiryAi", "AiryAiPrime",%
2473        "AiryAiZero", "AiryBi", "AiryBiPrime", "AiryBiZero",%
2474        "AlgebraicIntegerQ", "AlgebraicNumber", "AlgebraicNumberDenominator",%
2475        "AlgebraicNumberNorm", "AlgebraicNumberPolynomial",%
2476        "AlgebraicNumberTrace", "AlgebraicRules", "AlgebraicRulesData",%
2477        "Algebraics", "AlgebraicUnitQ", "Alignment", "AlignmentMarker",%
2478        "AlignmentPoint", "All", "AllowedDimensions", "AllowedHeads",%
2479        "AllowGroupClose", "AllowIncomplete", "AllowInlineCells",%
2480        "AllowKernelInitialization", "AllowLooseGrammar",%
2481        "AllowReverseGroupClose", "AllowScriptLevelChange", "AllTrue",%
2482        "Alphabet", "AlphabeticOrder", "AlphabeticSort", "AlphaChannel",%
2483        "AlternateImage", "AlternatingFactorial", "AlternatingGroup",%
2484        "AlternativeHypothesis", "Alternatives", "AltitudeMethod",%
2485        "AmbientLight", "AmbiguityFunction", "AmbiguityList", "Analytic",%
2486        "AnatomyData", "AnatomyForm", "AnatomyPlot3D", "AnchoredSearch",%
2487        "And", "AndersonDarlingTest", "AngerJ", "AngleBracket", "AnglePath",%
2488        "AngleVector", "AngularGauge", "Animate", "AnimationCycleOffset",%
2489        "AnimationCycleRepetitions", "AnimationDirection",%
2490        "AnimationDisplayTime", "AnimationRate", "AnimationRepetitions",%
2491        "AnimationRunning", "AnimationRunTime", "AnimationTimeIndex",%
2492        "Animator", "AnimatorBox", "AnimatorBoxOptions", "AnimatorElements",%
2493        "Annotation", "Annuity", "AnnuityDue", "Annulus", "Anonymous",%
2494        "Antialiasing", "AntihermitianMatrixQ", "Antisymmetric",%
2495        "AntisymmetricMatrixQ", "AnyOrder", "AnySubset", "AnyTrue", "Apart",%
2496        "ApartSquareFree", "APIFunction", "Appearance", "AppearanceElements",%
2497        "AppearanceRules", "AppellF1", "Append", "AppendTo", "Apply",%
2498        "ArcCos", "ArcCosh", "ArcCot", "ArcCoth", "ArcCsc", "ArcCsch",%
2499        "ArcCurvature", "ARCHProcess", "ArcLength", "ArcSec", "ArcSech",%
2500        "ArcSin", "ArcSinDistribution", "ArcSinh", "ArcTan", "ArcTanh",%
2501        "Area", "Arg", "ArgMax", "ArgMin", "ArgumentCountQ", "ARIMAProcess",%
2502        "ArithmeticGeometricMean", "ARMAProcess", "ARProcess", "Array",%
2503        "ArrayComponents", "ArrayDepth", "ArrayFilter", "ArrayFlatten",%
2504        "ArrayMesh", "ArrayPad", "ArrayPlot", "ArrayQ", "ArrayResample",%
2505        "ArrayReshape", "ArrayRules", "Arrays", "Arrow", "Arrow3DBox",%
2506        "ArrowBox", "Arrowheads", "ASATriangle", "Ask", "AskAppend",%
2507        "AskConfirm", "AskDisplay", "AskedQ", "AskedValue", "AskFunction",%
2508        "AskTemplateDisplay", "AspectRatio", "AspectRatioFixed", "Assert",%
2509        "AssociateTo", "Association", "AssociationFormat", "AssociationMap",%
2510        "AssociationQ", "AssociationThread", "AssumeDeterministic",%
2511        "Assuming", "Assumptions", "AstronomicalData",%
2512        "AsymptoticOutputTracker", "Asynchronous", "AsynchronousTaskObject",%
2513        "AsynchronousTasks", "AtomQ", "Attributes", "Audio", "AudioAmplify",%
2514        "AudioBlockMap", "AudioChannelCombine", "AudioChannelMix",%
2515        "AudioChannels", "AudioChannelSeparate", "AudioData", "AudioDelay",%
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2516    "AudioDelete", "AudioDevice", "AudioFade", "AudioFrequencyShift",%
2517    "AudioGenerator", "AudioIntervals", "AudioJoin", "AudioLabel",%
2518    "AudioLength", "AudioLocalMeasurements", "AudioMeasurements",%
2519    "AudioNormalize", "AudioOverlay", "AudioPad", "AudioPan",%
2520    "AudioPartition", "AudioPitchShift", "AudioPlot", "AudioQ",%
2521    "AudioResample", "AudioReverb", "AudioSampleRate", "AudioSplit",%
2522    "AudioTimeStretch", "AudioTrim", "AudioType",%
2523    "AugmentedSymmetricPolynomial", "Authentication", "AutoAction",%
2524    "Autocomplete", "AutocompletionFunction", "AutoCopy",%
2525    "AutocorrelationTest", "AutoDelete", "AutoEvaluateEvents",%
2526    "AutoGeneratedPackage", "AutoIndent", "AutoIndentSpacings",%
2527    "AutoItalicWords", "AutoloadPath", "AutoMatch", "Automatic",%
2528    "AutomaticImageSize", "AutoMultiplicationSymbol",%
2529    "AutoNumberFormatting", "AutoOpenNotebooks", "AutoOpenPalettes",%
2530    "AutoRefreshed", "AutoRemove", "AutorunSequencing", "AutoScaling",%
2531    "AutoScroll", "AutoSpacing", "AutoStyleOptions", "AutoStyleWords",%
2532    "AutoSubmitting", "Axes", "AxesEdge", "AxesLabel", "AxesOrigin",%
2533    "AxesStyle", "Axis", "BabyMonsterGroupB", "Back", "Background",%
2534    "BackgroundTasksSettings", "Backslash", "Backsubstitution",%
2535    "Backward", "Ball", "Band", "BandpassFilter", "BandstopFilter",%
2536    "BarabasiAlbertGraphDistribution", "BarChart", "BarChart3D",%
2537    "BarcodeImage", "BarcodeRecognize", "BaringhausHenzeTest",%
2538    "BarLegend", "BarlowProschanImportance", "BarnesG", "BarOrigin",%
2539    "BarSpacing", "BartlettHannWindow", "BartlettWindow", "BaseForm",%
2540    "Baseline", "BaselinePosition", "BaseStyle",%
2541    "BatchNormalizationLayer", "BatchSize", "BatesDistribution",%
2542    "BattleLemarieWavelet", "BayesianMaximization",%
2543    "BayesianMaximizationObject", "BayesianMinimization",%
2544    "BayesianMinimizationObject", "Because", "BeckmannDistribution",%
2545    "Beep", "Before", "Begin", "BeginDialogPacket",%
2546    "BeginFrontEndInteractionPacket", "BeginPackage", "BellB", "BellY",%
2547    "Below", "BenfordDistribution", "BeniniDistribution",%
2548    "BenktanderGibratDistribution", "BenktanderWeibullDistribution",%
2549    "BernoulliB", "BernoulliDistribution", "BernoulliGraphDistribution",%
2550    "BernoulliProcess", "BernsteinBasis", "BesselFilterModel", "BesselI",%
2551    "BesselJ", "BesselJZero", "BesselK", "BesselY", "BesselYZero",%
2552    "Beta", "BetaBinomialDistribution", "BetaDistribution",%
2553    "BetaNegativeBinomialDistribution", "BetaPrimeDistribution",%
2554    "BetaRegularized", "Between", "BetweennessCentrality", "BezierCurve",%
2555    "BezierCurve3DBox", "BezierCurve3DBoxOptions", "BezierCurveBox",%
2556    "BezierCurveBoxOptions", "BezierFunction", "BilateralFilter",%
2557    "Binarize", "BinaryDistance", "BinaryFormat", "BinaryImageQ",%
2558    "BinaryRead", "BinaryReadList", "BinaryWrite", "BinCounts",%
2559    "BinLists", "Binomial", "BinomialDistribution", "BinomialProcess",%
2560    "BinormalDistribution", "BiorthogonalSplineWavelet",%
2561    "BipartiteGraphQ", "BiquadraticFilterModel", "BirnbaumImportance",%
2562    "BirnbaumSaundersDistribution", "BitAnd", "BitClear", "BitGet",%
2563    "BitLength", "BitNot", "BitOr", "BitSet", "BitShiftLeft",%
2564    "BitShiftRight", "BitXor", "Black", "BlackmanHarrisWindow",%
2565    "BlackmanNuttallWindow", "BlackmanWindow", "Blank", "BlankForm",%
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2566    "BlankNullSequence", "BlankSequence", "Blend", "Block", "BlockMap",%
2567    "BlockRandom", "BlomqvistBeta", "BlomqvistBetaTest", "Blue", "Blur",%
2568    "BodePlot", "BohmanWindow", "Bold", "Bookmarks", "Boole",%
2569    "BooleanConsecutiveFunction", "BooleanConvert",%
2570    "BooleanCountingFunction", "BooleanFunction", "BooleanGraph",%
2571    "BooleanMaxterms", "BooleanMinimize", "BooleanMinterms", "BooleanQ",%
2572    "BooleanRegion", "Booleans", "BooleanStrings", "BooleanTable",%
2573    "BooleanVariables", "BorderDimensions", "BorelTannerDistribution",%
2574    "Bottom", "BottomHatTransform", "BoundaryDiscretizeGraphics",%
2575    "BoundaryDiscretizeRegion", "BoundaryMesh", "BoundaryMeshRegion",%
2576    "BoundaryMeshRegionQ", "BoundaryStyle", "BoundedRegionQ",%
2577    "BoundingRegion", "Bounds", "Box", "BoxBaselineShift", "BoxData",%
2578    "BoxDimensions", "Boxed", "Boxes", "BoxForm", "BoxFormFormatTypes",%
2579    "BoxFrame", "BoxID", "BoxMargins", "BoxMatrix", "BoxObject",%
2580    "BoxRatios", "BoxRotation", "BoxRotationPoint", "BoxStyle",%
2581    "BoxWhiskerChart", "Bra", "BracketingBar", "BraKet",%
2582    "BrayCurtisDistance", "BreadthFirstScan", "Break", "BridgeData",%
2583    "BroadcastStationData", "Brown", "BrownForsytheTest",%
2584    "BrownianBridgeProcess", "BrowserCategory", "BSplineBasis",%
2585    "BSplineCurve", "BSplineCurve3DBox", "BSplineCurve3DBoxOptions",%
2586    "BSplineCurveBox", "BSplineCurveBoxOptions", "BSplineFunction",%
2587    "BSplineSurface", "BSplineSurface3DBox",%
2588    "BSplineSurface3DBoxOptions", "BubbleChart", "BubbleChart3D",%
2589    "BubbleScale", "BubbleSizes", "BuildingData", "BulletGauge",%
2590    "BusinessDayQ", "ButterflyGraph", "ButterworthFilterModel", "Button",%
2591    "ButtonBar", "ButtonBox", "ButtonBoxOptions", "ButtonCell",%
2592    "ButtonContents", "ButtonData", "ButtonEvaluator",%
2593    "ButtonExpandable", "ButtonFrame", "ButtonFunction", "ButtonMargins",%
2594    "ButtonMinHeight", "ButtonNote", "ButtonNotebook", "ButtonSource",%
2595    "ButtonStyle", "ButtonStyleMenuListing", "Byte", "ByteArray",%
2596    "ByteArrayQ", "ByteCount", "ByteOrdering", "C", "CachedValue",%
2597    "CacheGraphics", "CachePersistence", "CalendarConvert",%
2598    "CalendarData", "CalendarType", "Callout", "CalloutMarker",%
2599    "CalloutStyle", "CallPacket", "CanberraDistance", "Cancel",%
2600    "CancelButton", "CandlestickChart", "CanonicalGraph",%
2601    "CanonicalName", "CanonicalWarpingCorrespondence",%
2602    "CanonicalWarpingDistance", "CantorStaircase", "Cap", "CapForm",%
2603    "CapitalDifferentialD", "Capitalize", "CapsuleShape",%
2604    "CardinalBSplineBasis", "CarlemanLinearize", "CarmichaelLambda",%
2605    "CaseOrdering", "Cases", "CaseSensitive", "Cashflow", "Casoratian",%
2606    "Catalan", "CatalanNumber", "Catch", "Catenate", "CatenateLayer",%
2607    "CauchyDistribution", "CauchyWindow", "CayleyGraph", "CDF",%
2608    "CDFDeploy", "CDFInformation", "CDFWavelet", "Ceiling",%
2609    "CelestialSystem", "Cell", "CellAutoOverwrite", "CellBaseline",%
2610    "CellBoundingBox", "CellBracketOptions", "CellChangeTimes",%
2611    "CellContents", "CellContext", "CellDingbat",%
2612    "CellDynamicExpression", "CellEditDuplicate",%
2613    "CellElementsBoundingBox", "CellElementSpacings", "CellEpilog",%
2614    "CellEvaluationDuplicate", "CellEvaluationFunction",%
2615    "CellEventActions", "CellFrame", "CellFrameColor",%
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2616    "CellFrameLabelMargins", "CellFrameLabels", "CellFrameMargins",%
2617    "CellGroup", "CellGroupData", "CellGrouping", "CellGroupingRules",%
2618    "CellHorizontalScrolling", "CellID", "CellLabel",%
2619    "CellLabelAutoDelete", "CellLabelMargins", "CellLabelPositioning",%
2620    "CellMargins", "CellObject", "CellOpen", "CellPrint", "CellProlog",%
2621    "Cells", "CellSize", "CellStyle", "CellTags", "CellularAutomaton",%
2622    "CensoredDistribution", "Censoring", "Center", "CenterArray",%
2623    "CenterDot", "CentralMoment", "CentralMomentGeneratingFunction",%
2624    "CForm", "ChampernowneNumber", "ChangeOptions", "ChannelBase",%
2625    "ChannelDatabin", "ChannelHistoryLength", "ChannelListen",%
2626    "ChannelListener", "ChannelListeners", "ChannelListenerWait",%
2627    "ChannelObject", "ChannelPreSendFunction", "ChannelSend",%
2628    "ChannelSubscribers", "ChanVeseBinarize", "Character",%
2629    "CharacterCounts", "CharacterEncoding", "CharacterEncodingsPath",%
2630    "CharacteristicFunction", "CharacteristicPolynomial",%
2631    "CharacterName", "CharacterRange", "Characters", "ChartBaseStyle",%
2632    "ChartElementData", "ChartElementDataFunction",%
2633    "ChartElementFunction", "ChartElements", "ChartLabels",%
2634    "ChartLayout", "ChartLegends", "ChartStyle", "Chebyshev1FilterModel",%
2635    "Chebyshev2FilterModel", "ChebyshevDistance", "ChebyshevT",%
2636    "ChebyshevU", "Check", "CheckAbort", "CheckAll", "Checkbox",%
2637    "CheckboxBar", "CheckboxBox", "CheckboxBoxOptions", "ChemicalData",%
2638    "ChessboardDistance", "ChiDistribution", "ChineseRemainder",%
2639    "ChiSquareDistribution", "ChoiceButtons", "ChoiceDialog",%
2640    "CholeskyDecomposition", "Chop", "ChromaticityPlot",%
2641    "ChromaticityPlot3D", "ChromaticPolynomial", "Circle", "CircleBox",%
2642    "CircleDot", "CircleMinus", "CirclePlus", "CirclePoints",%
2643    "CircleTimes", "CirculantGraph",%
2644    "CircularOrthogonalMatrixDistribution",%
2645    "CircularQuaternionMatrixDistribution",%
2646    "CircularRealMatrixDistribution",%
2647    "CircularSymplecticMatrixDistribution",%
2648    "CircularUnitaryMatrixDistribution", "Circumsphere", "CityData",%
2649    "ClassifierFunction", "ClassifierInformation",%
2650    "ClassifierMeasurements", "ClassifierMeasurementsObject", "Classify",%
2651    "ClassPriors", "Clear", "ClearAll", "ClearAttributes",%
2652    "ClearCookies", "ClearPermissions", "ClearSystemCache",%
2653    "ClebschGordan", "ClickPane", "Clip", "ClipboardNotebook",%
2654    "ClipFill", "ClippingStyle", "ClipPlanes", "ClipPlanesStyle",%
2655    "ClipRange", "Clock", "ClockGauge", "ClockwiseContourIntegral",%
2656    "Close", "Closed", "CloseKernels", "ClosenessCentrality", "Closing",%
2657    "ClosingAutoSave", "ClosingEvent", "CloudAccountData", "CloudBase",%
2658    "CloudConnect", "CloudDeploy", "CloudDirectory", "CloudDisconnect",%
2659    "CloudEvaluate", "CloudExport", "CloudExpression",%
2660    "CloudExpressions", "CloudFunction", "CloudGet", "CloudImport",%
2661    "CloudLoggingData", "CloudObject", "CloudObjectInformation",%
2662    "CloudObjectInformationData", "CloudObjects", "CloudPublish",%
2663    "CloudPut", "CloudSave", "CloudShare", "CloudSubmit", "CloudSymbol",%
2664    "ClusterClassify", "ClusterDissimilarityFunction",%
2665    "ClusteringComponents", "ClusteringTree", "CMYKColor", "Coarse",%
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2666        "CodeAssistOptions", "Coefficient", "CoefficientArrays",%
2667        "CoefficientDomain", "CoefficientList", "CoefficientRules",%
2668        "CoifletWavelet", "Collect", "Colon", "ColonForm", "ColorBalance",%
2669        "ColorCombine", "ColorConvert", "ColorCoverage", "ColorData",%
2670        "ColorDataFunction", "ColorDistance", "ColorFunction",%
2671        "ColorFunctionScaling", "Colorize", "ColorNegate", "ColorOutput",%
2672        "ColorProfileData", "ColorQ", "ColorQuantize", "ColorReplace",%
2673        "ColorRules", "ColorSelectorSettings", "ColorSeparate",%
2674        "ColorSetter", "ColorSetterBox", "ColorSetterBoxOptions",%
2675        "ColorSlider", "ColorSpace", "ColorToneMapping", "Column",%
2676        "ColumnAlignments", "ColumnBackgrounds", "ColumnForm", "ColumnLines",%
2677        "ColumnsEqual", "ColumnSpacings", "ColumnWidths", "CombinerFunction",%
2678        "CometData", "CommonDefaultFormatTypes", "Commonest",%
2679        "CommonestFilter", "CommonName", "CommonUnits",%
2680        "CommunityBoundaryStyle", "CommunityGraphPlot", "CommunityLabels",%
2681        "CommunityRegionStyle", "CompanyData", "CompatibleUnitQ",%
2682        "CompilationOptions", "CompilationTarget", "Compile", "Compiled",%
2683        "CompiledFunction", "Complement", "CompleteGraph", "CompleteGraphQ",%
2684        "CompleteKaryTree", "CompletionsListPacket", "Complex", "Complexes",%
2685        "ComplexExpand", "ComplexInfinity", "ComplexityFunction",%
2686        "ComponentMeasurements", "ComponentwiseContextMenu", "Compose",%
2687        "ComposeList", "ComposeSeries", "CompositeQ", "Composition",%
2688        "CompoundElement", "CompoundExpression",%
2689        "CompoundPoissonDistribution", "CompoundPoissonProcess",%
2690        "CompoundRenewalProcess", "Compress", "CompressedData", "Condition",%
2691        "ConditionalExpression", "Conditioned", "Cone", "ConeBox",%
2692        "ConfidenceLevel", "ConfidenceRange", "ConfidenceTransform",%
2693        "ConfigurationPath", "ConformationRules", "ConformAudio",%
2694        "ConformImages", "Congruent", "ConicHullRegion",%
2695        "ConicHullRegion3DBox", "ConicHullRegionBox", "Conjugate",%
2696        "ConjugateTranspose", "Conjunction", "Connect",%
2697        "ConnectedComponents", "ConnectedGraphComponents", "ConnectedGraphQ",%
2698        "ConnectedMeshComponents", "ConnectLibraryCallbackFunction",%
2699        "ConnesWindow", "ConoverTest", "ConsoleMessage",%
2700        "ConsoleMessagePacket", "ConsolePrint", "Constant", "ConstantArray",%
2701        "ConstantImage", "ConstantRegionQ", "Constants", "ConstellationData",%
2702        "ConstrainedMax", "ConstrainedMin", "Containing", "ContainsAll",%
2703        "ContainsAny", "ContainsExactly", "ContainsNone", "ContainsOnly",%
2704        "ContentFieldOptions", "ContentLocationFunction", "ContentObject",%
2705        "ContentPadding", "ContentsBoundingBox", "ContentSelectable",%
2706        "ContentSize", "Context", "ContextMenu", "Contexts",%
2707        "ContextToFileName", "Continuation", "Continue", "ContinuedFraction",%
2708        "ContinuedFractionK", "ContinuousAction", "ContinuousMarkovProcess",%
2709        "ContinuousTask", "ContinuousTimeModelQ", "ContinuousWaveletData",%
2710        "ContinuousWaveletTransform", "ContourDetect", "ContourGraphics",%
2711        "ContourIntegral", "ContourLabels", "ContourLines", "ContourPlot",%
2712        "ContourPlot3D", "Contours", "ContourShading", "ContourSmoothing",%
2713        "ContourStyle", "ContraharmonicMean", "Control", "ControlActive",%
2714        "ControlAlignment", "ControllabilityGramian",%
2715        "ControllabilityMatrix", "ControllableDecomposition",%
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4073      "$CloudConnected", "$CloudCreditsAvailable", "$CloudEvaluation",%
4074      "$CloudExpressionBase", "$CloudRootDirectory", "$CloudSymbolBase",%
4075      "$CloudVersion", "$CloudVersionNumber", "$CommandLine",%
4076      "$CompilationTarget", "$ConditionHold", "$ConfiguredKernels",%
4077      "$Context", "$ContextPath", "$ControlActiveSetting", "$Cookies",%
4078      "$CookieStore", "$CreationDate", "$CurrentLink", "$DateStringFormat",%
4079      "$DefaultAudioOutputDevice", "$DefaultFont", "$DefaultFrontEnd",%
4080      "$DefaultImagingDevice", "$DefaultLocalBase", "$DefaultPath",%
4081      "$Display", "$DisplayFunction", "$DistributedContexts",%
4082      "$DynamicEvaluation", "$Echo", "$EmbedCodeEnvironments",%
4083      "$EmbeddableServices", "$EntityStores", "$Epilog",%
4084      "$EvaluationCloudObject", "$EvaluationEnvironment", "$ExportFormats",%
4085      "$Failed", "$FinancialDataSource", "$FontFamilies", "$FormatType",%
4086      "$FrontEnd", "$FrontEndSession", "$GeoEntityTypes", "$GeoLocation",%
4087      "$GeoLocationCity", "$GeoLocationCountry", "$GeoLocationPrecision",%
4088      "$GeoLocationSource", "$HistoryLength", "$HomeDirectory",%
4089      "$HTMLExportRules", "$HTTPCookies", "$HTTPRequest", "$IgnoreEOF",%
4090      "$ImageFormattingWidth", "$ImagingDevice", "$ImagingDevices",%
4091      "$ImportFormats", "$InitialDirectory", "$Input", "$InputFileName",%
4092      "$InputStreamMethods", "$Inspector", "$InstallationDate",%
4093      "$InstallationDirectory", "$InterfaceEnvironment",%
4094      "$InterpreterTypes", "$IterationLimit", "$KernelCount", "$KernelID",%
4095      "$Language", "$LaunchDirectory", "$LibraryPath",%
4096      "$LicenseExpirationDate", "$LicenseID", "$LicenseProcesses",%
4097      "$LicenseServer", "$LicenseSubprocesses", "$LicenseType", "$Line",%
4098      "$Linked", "$LinkSupported", "$LoadedFiles", "$LocalBase",%
4099      "$LocalSymbolBase", "$MachineAddresses", "$MachineDomain",%
4100      "$MachineDomains", "$MachineEpsilon", "$MachineID", "$MachineName",%
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4102      "$MaxLicenseProcesses", "$MaxLicenseSubprocesses",%
4103      "$MaxMachineNumber", "$MaxNumber", "$MaxPiecewiseCases",%
4104      "$MaxPrecision", "$MaxRootDegree", "$MessageGroups", "$MessageList",%
4105      "$MessagePrePrint", "$Messages", "$MinMachineNumber", "$MinNumber",%
4106      "$MinorReleaseNumber", "$MinPrecision", "$ModuleNumber",%
4107      "$NetworkLicense", "$NewMessage", "$NewSymbol", "$Notebooks",%
4108      "$NumberMarks", "$Off", "$OperatingSystem", "$Output",%
4109      "$OutputForms", "$OutputSizeLimit", "$OutputStreamMethods",%
4110      "$Packages", "$ParentLink", "$ParentProcessID", "$PasswordFile",%
4111      "$PatchLevelID", "$Path", "$PathnameSeparator", "$PerformanceGoal",%
4112      "$Permissions", "$PermissionsGroupBase", "$PhoneNumber",%
4113      "$PipeSupported", "$PlotTheme", "$Post", "$Pre",%
4114      "$PreferencesDirectory", "$PrePrint", "$PreRead", "$PrintForms",%
4115      "$PrintLiteral", "$Printout3DPreviewer", "$ProcessID",%
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4118      "$RegisteredDeviceClasses", "$RegisteredUserName", "$ReleaseNumber",%
4119      "$RequesterAddress", "$RequesterWolframID", "$RequesterWolframUUID",%
4120      "$RootDirectory", "$ScheduledTask", "$ScriptCommandLine",%
4121      "$ScriptInputString", "$Services", "$SessionID", "$SetParentLink",%
4122      "$SharedFunctions", "$SharedVariables", "$SMSDestination",%
4123      "$SoundDisplay", "$SoundDisplayFunction", "$SourceLink",%
4124      "$SuppressInputFormHeads", "$SynchronousEvaluation",%
4125      "$SyntaxHandler", "$System", "$SystemCharacterEncoding", "$SystemID",%
4126      "$SystemMemory", "$SystemShell", "$SystemTimeZone",%
4127      "$SystemWordLength", "$TemplatePath", "$TemporaryDirectory",%
4128      "$TemporaryPrefix", "$TextStyle", "$TimedOut", "$TimeUnit",%
4129      "$TimeZone", "$TimeZoneEntity", "$TopDirectory", "$TraceOff",%
4130      "$TraceOn", "$TracePattern", "$TracePostAction", "$TracePreAction",%
4131      "$UnitSystem", "$Urgent", "$UserAddOnsDirectory",%
4132      "$UserAgentLanguages", "$UserAgentMachine", "$UserAgentName",%
4133      "$UserAgentOperatingSystem", "$UserAgentString", "$UserAgentVersion",%
4134      "$UserBaseDirectory", "$UserDocumentsDirectory", "$UserName",%
4135      "$Version", "$VersionNumber", "$WolframID", "$WolframUUID"%
4136    }%
4137 }

4138 \lst@definelanguage[5.2]{Mathematica}[3.0]{Mathematica}{%
4139    morekeywords={Above, AbsoluteOptions, AbsoluteTiming, AccountingForm,%
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4142       Algebraics, Alias, AlignmentMarker, AllowInlineCells,%
4143       AllowScriptLevelChange, Analytic, AnimationCycleOffset,%
4144       AnimationCycleRepetitions, AnimationDirection, AnimationDisplayTime,%
4145       ApartSquareFree, AppellF1, ArgumentCountQ, ArrayDepth, ArrayPlot,%
4146       ArrayQ, ArrayRules, AspectRatioFixed, Assuming, Assumptions,%
4147       AutoDelete, AutoEvaluateEvents, AutoGeneratedPackage, AutoIndent,%
4148       AutoIndentSpacings, AutoItalicWords, AutoloadPath, AutoOpenNotebooks,%
4149       AutoOpenPalettes, AutoScroll, AutoSpacing, AutoStyleOptions, Axis,%
4150       BackgroundTasksSettings, Backsubstitution, Backward, Baseline, Before,%
4151       BeginDialogPacket, BeginFrontEndInteractionPacket, Below, BezoutMatrix,%
4152       BinaryFormat, BinaryGet, BinaryRead, BinaryReadList, BinaryWrite,%
4153       BitAnd, BitNot, BitOr, BitXor, Black, BlankForm, Blue, Boole, Booleans,%
4154       Bottom, Bounds, Box, BoxBaselineShift, BoxData, BoxDimensions,%
4155       BoxFormFormatTypes, BoxFrame, BoxMargins, BoxRegion, Brown, Buchberger,%
4156       Button, ButtonBox, ButtonBoxOptions, ButtonCell, ButtonContents,%
4157       ButtonData, ButtonEvaluator, ButtonExpandable, ButtonFrame,%
4158       ButtonFunction, ButtonMargins, ButtonMinHeight, ButtonNote,%
4159       ButtonNotebook, ButtonSource, ButtonStyle, ButtonStyleMenuListing,%
4160       ByteOrdering, CallPacket, CarmichaelLambda, Cell, CellAutoOverwrite,%
4161       CellBaseline, CellBoundingBox, CellBracketOptions, CellContents,%
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4169      CellStyle, CellTags, CellularAutomaton, Center, CharacterEncoding,%
4170      CharacterEncodingsPath, CharacteristicPolynomial, CharacterRange,%
4171      CheckAll, CholeskyDecomposition, Clip, ClipboardNotebook, Closed,%
4172      ClosingAutoSave, CoefficientArrays, CoefficientDomain,%
4173      CofactorExpansion, ColonForm, ColorFunctionScaling, ColorRules,%
4174      ColorSelectorSettings, Column, ColumnAlignments, ColumnLines,%
4175      ColumnsEqual, ColumnSpacings, ColumnWidths, CommonDefaultFormatTypes,%
4176      CompileOptimizations, CompletionsListPacket, Complexes,%
4177      ComplexityFunction, Compose, ComposeSeries, ConfigurationPath,%
4178      ConjugateTranspose, Connect, ConsoleMessage, ConsoleMessagePacket,%
4179      ConsolePrint, ContentsBoundingBox, ContextToFileName,%
4180      ContinuedFraction, ConversionOptions, ConversionRules,%
4181      ConvertToBitmapPacket, ConvertToPostScript, ConvertToPostScriptPacket,%
4182      Copyable, CoshIntegral, CounterAssignments, CounterBox,%
4183      CounterBoxOptions, CounterEvaluator, CounterFunction,%
4184      CounterIncrements, CounterStyle, CounterStyleMenuListing,%
4185      CreatePalettePacket, Cross, CurrentlySpeakingPacket, Cyan,%
4186      CylindricalDecomposition, DampingFactor, DataRange, Debug, DebugTag,%
4187      Decimal, DedekindEta, DefaultDuplicateCellStyle, DefaultFontProperties,%
4188      DefaultFormatType, DefaultFormatTypeForStyle, DefaultInlineFormatType,%
4189      DefaultInputFormatType, DefaultNaturalLanguage, DefaultNewCellStyle,%
4190      DefaultNewInlineCellStyle, DefaultNotebook, DefaultOutputFormatType,%
4191      DefaultStyleDefinitions, DefaultTextFormatType,%
4192      DefaultTextInlineFormatType, DefaultValues, DefineExternal,%
4193      DegreeLexicographic, DegreeReverseLexicographic, Deletable,%
4194      DeleteContents, DeletionWarning, DelimiterFlashTime, DelimiterMatching,%
4195      Delimiters, DependentVariables, DiacriticalPositioning, DialogLevel,%
4196      DifferenceOrder, DigitCharacter, DigitCount, DiracDelta, Direction,%
4197      DirectoryName, DisableConsolePrintPacket, DiscreteDelta,%
4198      DisplayAnimation, DisplayEndPacket, DisplayFlushImagePacket,%
4199      DisplayForm, DisplayPacket, DisplayRules, DisplaySetSizePacket,%
4200      DisplayString, DivisionFreeRowReduction, DOSTextFormat,%
4201      DoubleExponential, DoublyInfinite, Down, DragAndDrop, DrawHighlighted,%
4202      DualLinearProgramming, DumpGet, DumpSave, Edit, Editable,%
4203      EditButtonSettings, EditCellTagsSettings, EditDefinition, EditIn,%
4204      Element, EliminationOrder, EllipticExpPrime, EllipticNomeQ,%
4205      EllipticReducedHalfPeriods, EllipticThetaPrime, Empty,%
4206      EnableConsolePrintPacket, Encoding, EndAdd, EndDialogPacket,%
4207      EndFrontEndInteractionPacket, EndOfLine, EndOfString, Enter,%
4208      EnterExpressionPacket, EnterTextPacket, EqualColumns, EqualRows,%
4209      EquatedTo, Erfi, ErrorBox, ErrorBoxOptions, ErrorNorm, ErrorPacket,%
4210      ErrorsDialogSettings, Evaluatable, EvaluatePacket, EvaluationCell,%
4211      EvaluationCompletionAction, EvaluationMonitor, EvaluationNotebook,%
4212      Evaluator, EvaluatorNames, EventEvaluator, ExactNumberQ,%
4213      ExactRootIsolation, Except, ExcludedForms, Exists, ExitDialog,%
4214      ExponentPosition, ExponentStep, Export, ExportAutoReplacements,%
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4215    ExportPacket, ExportString, ExpressionPacket, ExpToTrig, Extension,%
4216    ExternalCall, ExternalDataCharacterEncoding, Extract, Fail,%
4217    FEDisableConsolePrintPacket, FEEnableConsolePrintPacket, Fibonacci,%
4218    File, FileFormat, FileInformation, FileName, FileNameDialogSettings,%
4219    FindFit, FindInstance, FindMaximum, FindSettings, FitAll,%
4220    FlushPrintOutputPacket, Font, FontColor, FontFamily, FontName,%
4221    FontPostScriptName, FontProperties, FontReencoding, FontSize,%
4222    FontSlant, FontSubstitutions, FontTracking, FontVariations, FontWeight,%
4223    ForAll, FormatRules, FormatTypeAutoConvert, FormatValues, FormBox,%
4224    FormBoxOptions, Forward, ForwardBackward, FourierCosTransform,%
4225    FourierParameters, FourierSinTransform, FourierTransform,%
4226    FractionalPart, FractionBox, FractionBoxOptions, FractionLine,%
4227    FrameBox, FrameBoxOptions, FresnelC, FresnelS, FromContinuedFraction,%
4228    FromDigits, FrontEndExecute, FrontEndObject, FrontEndStackSize,%
4229    FrontEndToken, FrontEndTokenExecute, FrontEndVersion, Full, FullAxes,%
4230    FullSimplify, FunctionExpand, FunctionInterpolation, GaussKronrod,%
4231    GaussPoints, GenerateBitmapCaches, GenerateConditions, GeneratedCell,%
4232    GeneratedParameters, Generic, GetBoundingBoxSizePacket, GetContext,%
4233    GetFileName, GetFrontEndOptionsDataPacket,%
4234    GetLinebreakInformationPacket, GetMenusPacket,%
4235    GetPageBreakInformationPacket, Glaisher, GlobalPreferences,%
4236    GlobalSession, Gradient, GraphicsData, GraphicsGrouping, Gray, Green,%
4237    Grid, GridBaseline, GridBox, GridBoxOptions, GridCreationSettings,%
4238    GridDefaultElement, GridFrame, GridFrameMargins, GroupPageBreakWithin,%
4239    HarmonicNumber, Hash, HashTable, HeadCompose, HelpBrowserLookup,%
4240    HelpBrowserNotebook, HelpBrowserSettings, HessenbergDecomposition,%
4241    Hessian, HoldAllComplete, HoldComplete, HoldPattern, Horizontal,%
4242    HorizontalForm, HorizontalScrollPosition, HTMLSave,%
4243    Hypergeometric0F1Regularized, Hypergeometric1F1Regularized,%
4244    Hypergeometric2F1Regularized, HypergeometricPFQ,%
4245    HypergeometricPFQRegularized, HyperlinkCreationSettings, Hyphenation,%
4246    HyphenationOptions, IgnoreCase, ImageCache, ImageCacheValid,%
4247    ImageMargins, ImageOffset, ImageRangeCache, ImageRegion,%
4248    ImageResolution, ImageRotated, ImageSize, Import,%
4249    ImportAutoReplacements, ImportString, IncludeFileExtension,%
4250    IncludeSingularTerm, IndentingNewlineSpacings, IndentMaxFraction,%
4251    IndexCreationOptions, Inequality, InexactNumberQ, InexactNumbers,%
4252    Inherited, InitializationCell, InitializationCellEvaluation,%
4253    InitializationCellWarning, InlineCounterAssignments,%
4254    InlineCounterIncrements, InlineRules, InputAliases, InputAutoFormat,%
4255    InputAutoReplacements, InputGrouping, InputNamePacket, InputNotebook,%
4256    InputPacket, InputSettings, InputStringPacket, InputToBoxFormPacket,%
4257    InputToInputForm, InputToStandardForm, InsertionPointObject,%
4258    IntegerExponent, IntegerPart, Integers, Interactive, Interlaced,%
4259    InterpolationOrder, InterpolationPoints, InterpolationPrecision,%
4260    InterpretationBox, InterpretationBoxOptions, InterpretTemplate,%
4261    InterruptSettings, Interval, IntervalIntersection, IntervalMemberQ,%
4262    IntervalUnion, InverseBetaRegularized, InverseEllipticNomeQ,%
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4264    InverseFourierSinTransform, InverseFourierTransform,%
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4267    InverseJacobiNC, InverseJacobiND, InverseJacobiNS, InverseJacobiSC,%
4268    InverseJacobiSD, InverseLaplaceTransform, InverseWeierstrassP,%
4269    InverseZTransform, Jacobian, JacobiCD, JacobiCN, JacobiCS, JacobiDC,%
4270    JacobiDN, JacobiDS, JacobiNC, JacobiND, JacobiNS, JacobiSC, JacobiSD,%
4271    JordanDecomposition, K, Khinchin, KleinInvariantJ, KroneckerDelta,%
4272    Language, LanguageCategory, LaplaceTransform, Larger, Launch,%
4273    LayoutInformation, Left, LetterCharacter, Lexicographic, LicenseID,%
4274    LimitsPositioning, LimitsPositioningTokens, LinearSolveFunction,%
4275    LinebreakAdjustments, LineBreakWithin, LineForm, LineIndent,%
4276    LineSpacing, LineWrapParts, LinkActivate, LinkClose, LinkConnect,%
4277    LinkConnectedQ, LinkCreate, LinkError, LinkFlush, LinkHost,%
4278    LinkInterrupt, LinkLaunch, LinkMode, LinkObject, LinkOpen, LinkOptions,%
4279    LinkPatterns, LinkProtocol, LinkRead, LinkReadHeld, LinkReadyQ, Links,%
4280    LinkWrite, LinkWriteHeld, ListConvolve, ListCorrelate, Listen,%
4281    ListInterpolation, ListQ, LiteralSearch, LongestMatch, LongForm,%
4282    Loopback, LUBackSubstitution, LUDecomposition, MachineID, MachineName,%
4283    MachinePrecision, MacintoshSystemPageSetup, Magenta, Magnification,%
4284    MakeBoxes, MakeExpression, MakeRules, Manual, MatchLocalNameQ,%
4285    MathematicaNotation, MathieuC, MathieuCharacteristicA,%
4286    MathieuCharacteristicB, MathieuCharacteristicExponent, MathieuCPrime,%
4287    MathieuS, MathieuSPrime, MathMLForm, MathMLText, MatrixRank, Maximize,%
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4289    MaxSteps, MaxStepSize, Mean, Median, MeijerG, MenuPacket,%
4290    MessageOptions, MessagePacket, MessagesNotebook, MetaCharacters,%
4291    Method, MethodOptions, Minimize, MinRecursion, MinSize, Mode,%
4292    ModularLambda, MonomialOrder, MonteCarlo, Most, MousePointerNote,%
4293    MultiDimensional, MultilaunchWarning, MultilineFunction,%
4294    MultiplicativeOrder, Multiplicity, Nand,%
4295    NeedCurrentFrontEndPackagePacket, NeedCurrentFrontEndSymbolsPacket,%
4296    NestedScriptRules, NestWhile, NestWhileList, NevilleThetaC,%
4297    NevilleThetaD, NevilleThetaN, NevilleThetaS, Newton, Next, NHoldAll,%
4298    NHoldFirst, NHoldRest, NMaximize, NMinimize, NonAssociative,%
4299    NonPositive, Nor, Norm, NormalGrouping, NormalSelection, NormFunction,%
4300    Notebook, NotebookApply, NotebookAutoSave, NotebookClose,%
4301    NotebookConvert, NotebookConvertSettings, NotebookCreate,%
4302    NotebookCreateReturnObject, NotebookDefault, NotebookDelete,%
4303    NotebookDirectory, NotebookFind, NotebookFindReturnObject, NotebookGet,%
4304    NotebookGetLayoutInformationPacket, NotebookGetMisspellingsPacket,%
4305    NotebookInformation, NotebookLocate, NotebookObject, NotebookOpen,%
4306    NotebookOpenReturnObject, NotebookPath, NotebookPrint, NotebookPut,%
4307    NotebookPutReturnObject, NotebookRead, NotebookResetGeneratedCells,%
4308    Notebooks, NotebookSave, NotebookSaveAs, NotebookSelection,%
4309    NotebookSetupLayoutInformationPacket, NotebooksMenu, NotebookWrite,%
4310    NotElement, NProductExtraFactors, NProductFactors, NRoots,%
4311    NSumExtraTerms, NSumTerms, NumberMarks, NumberMultiplier, NumberString,%
4312    NumericFunction, NumericQ, NValues, Offset, OLEData,%
4313    OneStepRowReduction, Open, OpenFunctionInspectorPacket,%
4314    OpenSpecialOptions, OptimizationLevel, OptionInspectorSettings,%
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4316    Ordering, Oscillatory, OutputAutoOverwrite, OutputFormData,%
4317    OutputGrouping, OutputMathEditExpression, OutputNamePacket,%
4318    OutputToOutputForm, OutputToStandardForm, Over, Overflow, Overlaps,%
4319    Overscript, OverscriptBox, OverscriptBoxOptions, OwnValues, PadLeft,%
4320    PadRight, PageBreakAbove, PageBreakBelow, PageBreakWithin,%
4321    PageFooterLines, PageFooters, PageHeaderLines, PageHeaders,%
4322    PalettePath, PaperWidth, ParagraphIndent, ParagraphSpacing,%
4323    ParameterVariables, ParentConnect, ParentForm, Parenthesize,%
4324    PasteBoxFormInlineCells, Path, PatternTest, PeriodicInterpolation,%
4325    Pick, Piecewise, PiecewiseExpand, Pink, Pivoting, PixelConstrained,%
4326    Placeholder, Plain, Plot3Matrix, PointForm, PolynomialForm,%
4327    PolynomialReduce, Polynomials, PowerModList, Precedence,%
4328    PreferencesPath, PreserveStyleSheet, Previous, PrimaryPlaceholder,%
4329    Primes, PrincipalValue, PrintAction, PrintingCopies, PrintingOptions,%
4330    PrintingPageRange, PrintingStartingPageNumber,%
4331    PrintingStyleEnvironment, PrintPrecision, PrivateCellOptions,%
4332    PrivateEvaluationOptions, PrivateFontOptions, PrivateNotebookOptions,%
4333    PrivatePaths, ProductLog, PromptForm, Purple, Quantile,%
4334    QuasiMonteCarlo, QuasiNewton, RadicalBox, RadicalBoxOptions,%
4335    RandomSeed, RationalFunctions, Rationals, RawData, RawMedium,%
4336    RealBlockForm, Reals, Reap, Red, Refine, Refresh, RegularExpression,%
4337    Reinstall, Release, Removed, RenderingOptions, RepeatedString,%
4338    ReplaceList, Rescale, ResetMenusPacket, Resolve, ResumePacket,%
4339    ReturnExpressionPacket, ReturnInputFormPacket, ReturnPacket,%
4340    ReturnTextPacket, Right, Root, RootReduce, RootSum, Row, RowAlignments,%
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4342    RuleCondition, RuleForm, RulerUnits, Saveable, SaveAutoDelete,%
4343    ScreenRectangle, ScreenStyleEnvironment, ScriptBaselineShifts,%
4344    ScriptLevel, ScriptMinSize, ScriptRules, ScriptSizeMultipliers,%
4345    ScrollingOptions, ScrollPosition, Second, SectionGrouping, Selectable,%
4346    SelectedNotebook, Selection, SelectionAnimate, SelectionCell,%
4347    SelectionCellCreateCell, SelectionCellDefaultStyle,%
4348    SelectionCellParentStyle, SelectionCreateCell, SelectionDuplicateCell,%
4349    SelectionEvaluate, SelectionEvaluateCreateCell, SelectionMove,%
4350    SelectionSetStyle, SelectionStrategy, SendFontInformationToKernel,%
4351    SequenceHold, SequenceLimit, SeriesCoefficient, SetBoxFormNamesPacket,%
4352    SetEvaluationNotebook, SetFileLoadingContext, SetNotebookStatusLine,%
4353    SetOptionsPacket, SetSelectedNotebook, SetSpeechParametersPacket,%
4354    SetValue, ShortestMatch, ShowAutoStyles, ShowCellBracket,%
4355    ShowCellLabel, ShowCellTags, ShowClosedCellArea, ShowContents,%
4356    ShowCursorTracker, ShowGroupOpenCloseIcon, ShowPageBreaks,%
4357    ShowSelection, ShowShortBoxForm, ShowSpecialCharacters,%
4358    ShowStringCharacters, ShrinkWrapBoundingBox, SingleLetterItalics,%
4359    SingularityDepth, SingularValueDecomposition, SingularValueList,%
4360    SinhIntegral, Smaller, Socket, SolveDelayed, SoundAndGraphics, Sow,%
4361    Space, SpaceForm, SpanAdjustments, SpanCharacterRounding,%
4362    SpanLineThickness, SpanMaxSize, SpanMinSize, SpanningCharacters,%
4363    SpanSymmetric, Sparse, SparseArray, SpeakTextPacket,%
4364    SpellingDictionaries, SpellingDictionariesPath, SpellingOptions,%
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4365    SpellingSuggestionsPacket, Spherical, Split, SqrtBox, SqrtBoxOptions,%
4366    StandardDeviation, StandardForm, StartingStepSize, StartOfLine,%
4367    StartOfString, StartupSound, StepMonitor, StieltjesGamma, StoppingTest,%
4368    StringCases, StringCount, StringExpression, StringFreeQ, StringQ,%
4369    StringReplaceList, StringReplacePart, StringSplit, StripBoxes,%
4370    StripWrapperBoxes, StructuredSelection, StruveH, StruveL, StyleBox,%
4371    StyleBoxAutoDelete, StyleBoxOptions, StyleData, StyleDefinitions,%
4372    StyleForm, StyleMenuListing, StyleNameDialogSettings, StylePrint,%
4373    StyleSheetPath, Subresultants, SubscriptBox, SubscriptBoxOptions,%
4374    Subsets, Subsuperscript, SubsuperscriptBox, SubsuperscriptBoxOptions,%
4375    SubtractFrom, SubValues, SugarCube, SuperscriptBox,%
4376    SuperscriptBoxOptions, SuspendPacket, SylvesterMatrix, SymbolName,%
4377    Syntax, SyntaxForm, SyntaxPacket, SystemException, SystemHelpPath,%
4378    SystemStub, Tab, TabFilling, TabSpacings, TagBox, TagBoxOptions,%
4379    TaggingRules, TagStyle, TargetFunctions, TemporaryVariable, TensorQ,%
4380    TeXSave, TextAlignment, TextBoundingBox, TextData, TextJustification,%
4381    TextLine, TextPacket, TextParagraph, TextRendering, TextStyle,%
4382    ThisLink, TimeConstraint, TimeVariable, TitleGrouping, ToBoxes,%
4383    ToColor, ToFileName, Toggle, ToggleFalse, Tolerance, TooBig, Top,%
4384    ToRadicals, Total, Tr, TraceAction, TraceInternal, TraceLevel,%
4385    TraditionalForm, TraditionalFunctionNotation, TraditionalNotation,%
4386    TraditionalOrder, TransformationFunctions, TransparentColor,%
4387    Trapezoidal, TrigExpand, TrigFactor, TrigFactorList, TrigReduce,%
4388    TrigToExp, Tuples, UnAlias, Underflow, Underoverscript,%
4389    UnderoverscriptBox, UnderoverscriptBoxOptions, Underscript,%
4390    UnderscriptBox, UnderscriptBoxOptions, UndocumentedTestFEParserPacket,%
4391    UndocumentedTestGetSelectionPacket, UnitStep, Up, URL, Using, V2Get,%
4392    Value, ValueBox, ValueBoxOptions, ValueForm, Variance, Verbatim,%
4393    Verbose, VerboseConvertToPostScriptPacket, VerifyConvergence,%
4394    VerifySolutions, Version, VersionNumber, Vertical, VerticalForm,%
4395    ViewPointSelectorSettings, Visible, VisibleCell,%
4396    WeierstrassHalfPeriods, WeierstrassInvariants, WeierstrassSigma,%
4397    WeierstrassZeta, White, Whitespace, WhitespaceCharacter,%
4398    WindowClickSelect, WindowElements, WindowFloating, WindowFrame,%
4399    WindowFrameElements, WindowMargins, WindowMovable, WindowSize,%
4400    WindowTitle, WindowToolbars, WindowWidth, WordBoundary, WordCharacter,%
4401    WynnDegree, XMLElement},%
4402  morendkeywords={$,$AddOnsDirectory,$AnimationDisplayFunction,%
4403    $AnimationFunction,%
4404    $Assumptions,$BaseDirectory,$BoxForms,$ByteOrdering,%
4405    $CharacterEncoding,$ConditionHold,$CurrentLink,$DefaultPath,%
4406    $ExportEncodings,$ExportFormats,$FormatType,$FrontEnd,%
4407    $HistoryLength,$HomeDirectory,$ImportEncodings,$ImportFormats,%
4408    $InitialDirectory,$InstallationDate,$InstallationDirectory,%
4409    $InterfaceEnvironment,%
4410    $LaunchDirectory,$LicenseExpirationDate,$LicenseID,$LicenseProcesses,%
4411    $LicenseServer,$MachineDomain,$MaxExtraPrecision,$MaxLicenseProcesses,%
4412    $MaxNumber,$MaxPiecewiseCases,$MaxPrecision,$MaxRootDegree,%
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4414    $Off,$OutputForms,$ParentLink,$ParentProcessID,%
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4416    $PrintLiteral,$ProcessID,$ProcessorType,$ProductInformation,%
4417    $ProgramName,$PSDirectDisplay,$RandomState,$RasterFunction,%
4418    $RootDirectory,$SetParentLink,$SoundDisplay,$SuppressInputFormHeads,%
4419    $SystemCharacterEncoding,$SystemID,$TemporaryPrefix,$TextStyle,%
4420    $TopDirectory,$TraceOff,$TraceOn,$TracePattern,%
4421    $TracePostAction,$TracePreAction,$UserAddOnsDirectory,$UserBaseDirectory,%
4422    $UserName,Constant,Flat,HoldAll,%
4423    HoldAllComplete,HoldFirst,HoldRest,Listable,%
4424    Locked,NHoldAll,NHoldFirst,NHoldRest,%
4425    NumericFunction,OneIdentity,Orderless,Protected,%
4426    ReadProtected,SequenceHold},%
4427 }%

4428 %%
4429 %% Mathematica definitions (c) 1999 Michael Wiese
4430 %%
4431 \lst@definelanguage[3.0]{Mathematica}[1.0]{Mathematica}%
4432   {morekeywords={Abort,AbortProtect,AbsoluteDashing,AbsolutePointSize,%
4433        AbsoluteThickness,AbsoluteTime,AccountingFormAiry,AiPrime,AiryBi,%
4434        AiryBiPrime,Alternatives,AnchoredSearch,AxesEdge,AxesOrigin,%
4435        AxesStyle,Background,BetaRegularized,BoxStyle,C,CheckAbort,%
4436        Circle,ClebschGordan,CMYKColor,ColorFunction,ColorOutput,Compile,%
4437        Compiled,CompiledFunction,ComplexExpand,ComposeList,Composition,%
4438        ConstrainedMax,ConstrainedMin,Contexts,ContextToFilename,%
4439        ContourLines,Contours,ContourShading,ContourSmoothing,%
4440        ContourStyle,CopyDirectory,CopyFile,CosIntegral,CreateDirectory,%
4441        Cuboid,Date,DeclarePackage,DefaultColor,DefaultFont,Delete,%
4442        DeleteCases,DeleteDirectory,DeleteFile,Dialog,DialogIndent,%
4443        DialogProlog,DialogSymbols,DigitQ,Directory,DirectoryStack,Disk,%
4444        Dispatch,DownValues,DSolve,Encode,Epilog,Erfc,Evaluate,%
4445        ExponentFunction,FaceGrids,FileByteCount,FileDate,FileNames,%
4446        FileType,Find,FindList,FixedPointList,FlattenAt,Fold,FoldList,%
4447        Frame,FrameLabel,FrameStyle,FrameTicks,FromCharacterCode,%
4448        FromDate,FullGraphics,FullOptions,GammaRegularized,%
4449        GaussianIntegers,GraphicsArray,GraphicsSpacing,GridLines,%
4450        GroebnerBasis,Heads,HeldPart,HomeDirectory,Hue,IgnoreCases,%
4451        InputStream,Install,InString,IntegerDigits,InterpolatingFunction,%
4452        InterpolatingPolynomial,Interpolation,Interrupt,InverseFunction,%
4453        InverseFunctions,JacobiZeta,LetterQ,LinearProgramming,ListPlay,%
4454        LogGamma,LowerCaseQ,MachineNumberQ,MantissaExponent,MapIndexed,%
4455        MapThread,MatchLocalNames,MatrixExp,MatrixPower,MeshRange,%
4456        MeshStyle,MessageList,Module,NDSolve,NSolve,NullRecords,%
4457        NullWords,NumberFormat,NumberPadding,NumberSigns,OutputStream,%
4458        PaddedForm,ParentDirectory,Pause,Play,PlayRange,PlotRegion,%
4459        PolygonIntersections,PolynomialGCD,PolynomialLCM,PolynomialMod,%
4460        PostScript,PowerExpand,PrecisionGoal,PrimePi,Prolog,%
4461        QRDecomposition,Raster,RasterArray,RealDigits,Record,RecordLists,%
4462        RecordSeparators,ReleaseHold,RenameDirectory,RenameFile,%
4463        ReplaceHeldPart,ReplacePart,ResetDirectory,Residue,%
```

```
4464        RiemannSiegelTheta,RiemannSiegelZ,RotateLabel,SameTest,%
4465        SampleDepth,SampledSoundFunction,SampledSoundList,SampleRate,%
4466        SchurDecomposition,SessionTime,SetAccuracy,SetDirectory,%
4467        SetFileDate,SetPrecision,SetStreamPosition,Shallow,SignPadding,%
4468        SinIntegral,SixJSymbol,Skip,Sound,SpellingCorrection,%
4469        SphericalRegion,Stack,StackBegin,StackComplete,StackInhibit,%
4470        StreamPosition,Streams,StringByteCount,StringConversion,%
4471        StringDrop,StringInsert,StringPosition,StringReplace,%
4472        StringReverse,StringTake,StringToStream,SurfaceColor,%
4473        SyntaxLength,SyntaxQ,TableAlignments,TableDepth,%
4474        TableDirections,TableHeadings,TableSpacing,ThreeJSymbol,TimeUsed,%
4475        TimeZone,ToCharacterCode,ToDate,ToHeldExpression,TokenWords,%
4476        ToLowerCase,ToUpperCase,Trace,TraceAbove,TraceBackward,%
4477        TraceDepth,TraceDialog,TraceForward,TraceOff,TraceOn,%
4478        TraceOriginal,TracePrint,TraceScan,Trig,Unevaluated,Uninstall,%
4479        UnsameQ,UpperCaseQ,UpValues,ViewCenter,ViewVertical,With,Word,%
4480        WordSearch,WordSeparators},%
4481    morendkeywords={Stub,Temporary,$Aborted,$BatchInput,$BatchOutput,%
4482        $CreationDate,$DefaultFont,$DumpDates,$DumpSupported,$Failed,%
4483        $Input,$Inspector,$IterationLimit,$Language,$Letters,$Linked,%
4484        $LinkSupported,$MachineEpsilon,$MachineID,$MachineName,%
4485        $MachinePrecision,$MachineType,$MaxMachineNumber,$MessageList,%
4486        $MessagePrePrint,$MinMachineNumber,$ModuleNumber,$NewMessage,%
4487        $NewSymbol,$Notebooks,$OperatingSystem,$Packages,$PipeSupported,%
4488        $PreRead,$ReleaseNumber,$SessionID,$SoundDisplayFunction,%
4489        $StringConversion,$StringOrder,$SyntaxHandler,$TimeUnit,%
4490        $VersionNumber}%
4491    }%

4492 \lst@definelanguage[1.0]{Mathematica}%
4493    {morekeywords={Abs,Accuracy,AccurayGoal,AddTo,AiryAi,AlgebraicRules,%
4494        AmbientLight,And,Apart,Append,AppendTo,Apply,ArcCos,ArcCosh,%
4495        ArcCot,ArcCoth,ArcCsc,ArcCsch,ArcSec,ArcSech,ArcSin,ArcSinh,%
4496        ArcTan,ArcTanh,Arg,ArithmeticGeometricMean,Array,AspectRatio,%
4497        AtomQ,Attributes,Axes,AxesLabel,BaseForm,Begin,BeginPackage,%
4498        BernoulliB,BesselI,BesselJ,BesselK,BesselY,Beta,Binomial,Blank,%
4499        BlankNullSequence,BlankSequence,Block,Boxed,BoxRatios,Break,Byte,%
4500        ByteCount,Cancel,Cases,Catch,Ceiling,CForm,Character,Characters,%
4501        ChebyshevT,ChebyshevU,Check,Chop,Clear,ClearAll,ClearAttributes,%
4502        ClipFill,Close,Coefficient,CoefficientList,Collect,ColumnForm,%
4503        Complement,Complex,CompoundExpression,Condition,Conjugate,%
4504        Constants,Context,Continuation,Continue,ContourGraphics,%
4505        ContourPlot,Cos,Cosh,Cot,Coth,Count,Csc,Csch,Cubics,Cyclotomic,%
4506        D,Dashing,Decompose,Decrement,Default,Definition,Denominator,%
4507        DensityGraphics,DensityPlot,Depth,Derivative,Det,DiagonalMatrix,%
4508        DigitBlock,Dimensions,DirectedInfinity,Display,DisplayFunction,%
4509        Distribute,Divide,DivideBy,Divisors,DivisorSigma,Do,Dot,Drop,Dt,%
4510        Dump,EdgeForm,Eigensystem,Eigenvalues,Eigenvectors,Eliminate,%
4511        EllipticE,EllipticExp,EllipticF,EllipticK,EllipticLog,EllipticPi,%
4512        EllipticTheta,End,EndPackage,EngineeringForm,Environment,Equal,%
```

```
4513    Erf,EulerE,EulerPhi,EvenQ,Exit,Exp,Expand,ExpandAll,%
4514    ExpandDenominator,ExpandNumerator,ExpIntegralE,ExpIntegralEi,%
4515    Exponent,Expression,ExtendedGCD,FaceForm,Factor,FactorComplete,%
4516    Factorial,Factorial2,FactorInteger,FactorList,FactorSquareFree,%
4517    FactorSquareFreeList,FactorTerms,FactorTermsList,FindMinimum,%
4518    FindRoot,First,Fit,FixedPoint,Flatten,Floor,FontForm,For,Format,%
4519    FormatType,FortranForm,Fourier,FreeQ,FullDefinition,FullForm,%
4520    Function,Gamma,GCD,GegenbauerC,General,Get,Goto,Graphics,%
4521    Graphics3D,GrayLevel,Greater,GreaterEqual,Head,HermiteH,%
4522    HiddenSurface,Hold,HoldForm,Hypergeometric0F1,Hypergeometric1F1,%
4523    Hypergeometric2F1,HypergeometricU,Identity,IdentityMatrix,If,Im,%
4524    Implies,In,Increment,Indent,Infix,Information,Inner,Input,%
4525    InputForm,InputString,Insert,Integer,IntegerQ,Integrate,%
4526    Intersection,Inverse,InverseFourier,InverseJacobiSN,%
4527    InverseSeries,JacobiAmplitude,JacobiP,JacobiSN,JacobiSymbol,Join,%
4528    Label,LaguerreL,Last,LatticeReduce,LCM,LeafCount,LegendreP,%
4529    LegendreQ,LegendreType,Length,LerchPhi,Less,LessEqual,Level,%
4530    Lighting,LightSources,Limit,Line,LinearSolve,LineBreak,List,%
4531    ListContourPlot,ListDensityPlot,ListPlot,ListPlot3D,Literal,Log,%
4532    LogicalExpand,LogIntegral,MainSolve,Map,MapAll,MapAt,MatchQ,%
4533    MatrixForm,MatrixQ,Max,MaxBend,MaxMemoryUsed,MemberQ,%
4534    MemoryConstrained,MemoryInUse,Mesh,Message,MessageName,Messages,%
4535    Min,Minors,Minus,Mod,Modulus,MoebiusMu,Multinomial,N,NameQ,Names,%
4536    NBernoulliB,Needs,Negative,Nest,NestList,NIntegrate,%
4537    NonCommutativeMultiply,NonConstants,NonNegative,Normal,Not,%
4538    NProduct,NSum,NullSpace,Number,NumberForm,NumberPoint,NumberQ,%
4539    NumberSeparator,Numerator,O,OddQ,Off,On,OpenAppend,OpenRead,%
4540    OpenTemporary,OpenWrite,Operate,Optional,Options,Or,Order,%
4541    OrderedQ,Out,Outer,OutputForm,PageHeight,PageWidth,%
4542    ParametricPlot,ParametricPlot3D,Part,Partition,PartitionsP,%
4543    PartitionsQ,Pattern,Permutations,Plot,Plot3D,PlotDivision,%
4544    PlotJoined,PlotLabel,PlotPoints,PlotRange,PlotStyle,Pochhammer,%
4545    Plus,Point,PointSize,PolyGamma,Polygon,PolyLog,PolynomialQ,%
4546    PolynomialQuotient,PolynomialRemainder,Position,Positive,Postfix,%
4547    Power,PowerMod,PrecedenceForm,Precision,PreDecrement,Prefix,%
4548    PreIncrement,Prepend,PrependTo,Prime,PrimeQ,Print,PrintForm,%
4549    Product,Protect,PseudoInverse,Put,PutAppend,Quartics,Quit,%
4550    Quotient,Random,Range,Rational,Rationalize,Raw,Re,Read,ReadList,%
4551    Real,Rectangle,Reduce,Remove,RenderAll,Repeated,RepeatedNull,%
4552    Replace,ReplaceAll,ReplaceRepeated,Rest,Resultant,Return,Reverse,%
4553    RGBColor,Roots,RotateLeft,RotateRight,Round,RowReduce,Rule,%
4554    RuleDelayed,Run,RunThrough,SameQ,Save,Scaled,Scan,ScientificForm,%
4555    Sec,Sech,SeedRandom,Select,Sequence,SequenceForm,Series,%
4556    SeriesData,Set,SetAttributes,SetDelayed,SetOptions,Shading,Share,%
4557    Short,Show,Sign,Signature,Simplify,Sin,SingularValues,Sinh,%
4558    Skeleton,Slot,SlotSequence,Solve,SolveAlways,Sort,%
4559    SphericalHarmonicY,Splice,Sqrt,StirlingS1,StirlingS2,String,%
4560    StringBreak,StringForm,StringJoin,StringLength,StringMatchQ,%
4561    StringSkeleton,Subscript,Subscripted,Subtract,SubtractForm,Sum,%
4562    Superscript,SurfaceGraphics,Switch,Symbol,Table,TableForm,TagSet,%
```

```
4563        TagSetDelayed,TagUnset,Take,Tan,Tanh,ToString,TensorRank,TeXForm,%
4564        Text,TextForm,Thickness,Thread,Through,Throw,Ticks,%
4565        TimeConstrained,Times,TimesBy,Timing,ToExpression,Together,%
4566        ToRules,ToString,TotalHeight,TotalWidth,Transpose,TreeForm,TrueQ,%
4567        Unequal,Union,Unique,Unprotect,Unset,Update,UpSet,UpSetDelayed,%
4568        ValueQ,Variables,VectorQ,ViewPoint,WeierstrassP,%
4569        WeierstrassPPrime,Which,While,WorkingPrecision,Write,WriteString,%
4570        Xor,ZeroTest,Zeta},%
4571     morendkeywords={All,Automatic,Catalan,ComplexInfinity,Constant,%
4572        Degree,E,EndOfFile,EulerGamma,False,Flat,GoldenRatio,HoldAll,%
4573        HoldFirst,HoldRest,I,Indeterminate,Infinity,Listable,Locked,%
4574        Modular,None,Null,OneIdentity,Orderless,Pi,Protected,%
4575        ReadProtected,True,$CommandLine,$Context,$ContextPath,$Display,%
4576        $DisplayFunction,$Echo,$Epilog,$IgnoreEOF,$Line,$Messages,%
4577        $Output,$Path,$Post,$Pre,$PrePrint,$RecursionLimit,$System,%
4578        $Urgent,$Version},%
4579     sensitive,%
4580     morecomment=[s]{(*}{*)},%
4581     morestring=[d]"%
4582   }[keywords,comments,strings]
4583 ⟨/lang1⟩
```

2.44   Mercury

Dominique de Waleffe mailed me the data and Ralph Becket extended the definition.

```
4584 ⟨∗lang2⟩
4585 %%
4586 %% Mercury definition (c) 1997 Dominique de Waleffe
4587 %% Extended (c) 2001 Ralph Becket
4588 %%
4589 \lst@definelanguage{Mercury}%
4590   {otherkeywords={::,->,-->,--->,:-,==,=>,<=,<=>},%
4591    morekeywords={module,include_module,import_module,interface,%
4592        end_module,implementation,mode,is,failure,semidet,nondet,det,%
4593        multi,erroneous,inst,in,out,di,uo,ui,type,typeclass,instance,%
4594        where,with_type,pred,func,lambda,impure,semipure,if,then,else,%
4595        some,all,not,true,fail,pragma,memo,no_inline,inline,loop_check,%
4596        minimal_model,fact_table,type_spec,terminates,does_not_terminate,%
4597        check_termination,promise_only_solution,unsafe_promise_unique,%
4598        source_file,obsolete,import,export,c_header_code,c_code,%
4599        foreign_code,foreign_proc,may_call_mercury,will_not_call_mercury,%
4600        thread_safe,not_thread_safe},%
4601     sensitive=t,%
4602     morecomment=[l]\%,%
4603     morecomment=[s]{/*}{*/},%
4604     morestring=[bd]",%
4605     morestring=[bd]'%
4606   }[keywords,comments,strings]
```

2.45 MetaPost

Uwe Siart provided the keywords for a previous version. The current language definition comes from Brooks Moses.

4608 ⟨∗lang3⟩

```
4609 %%
4610 %% MetaPost definition (c) 2004 Brooks Moses
4611 %%   This definition is based on the language specifications
4612 %%   contained in the _User's Manual for Metapost_, with the core
4613 %%   language enhancements that are described in the _Drawing
4614 %%   Graphs with MetaPost_ documentation.
4615 %%
4616 \lst@definelanguage{MetaPost}%
4617   {% keywords[1] = MetaPost primitives (not found in following tables)
4618     morekeywords={end,begingroup,endgroup,beginfig,endfig,def,vardef,%
4619       primary,secondary,tertiary,primarydef,secondarydef,tertiarydef,%
4620       expr,suffix,text,enddef,if,fi,else,elseif,for,forsuffixes,%
4621       forever,endfor,upto,downto,stop,until,tension,controls,on,off,%
4622       btex,etex,within,input},
4623   % keywords[2] = Operators (Tables 6-9 in MetaPost User's manual)
4624     morekeywords=[2]{abs,and,angle,arclength,arctime,ASCII,bbox,bluepart,%
4625       boolean,bot,ceiling,center,char,color,cosd,cutafter,cutbefore,%
4626       cycle,decimal,dir,direction,directionpoint,directiontime,div,%
4627       dotprod,floor,fontsize,greenpart,hex,infont,intersectionpoint,%
4628       intersectiontimes,inverse,known,length,lft,llcorner,lrcorner,%
4629       makepath,makepen,mexp,mlog,mod,normaldeviate,not,numeric,oct,%
4630       odd,or,pair,path,pen,penoffset,picture,point,postcontrol,%
4631       precontrol,redpart,reverse,rotated,round,rt,scaled,shifted,%
4632       sind,slanted,sqrt,str,string,subpath,substring,top,transform,%
4633       transformed,ulcorner,uniformdeviate,unitvector,unknown,%
4634       urcorner,whatever,xpart,xscaled,xxpart,xypart,ypart,yscaled,%
4635       yxpart,yypart,zscaled,of,reflectedabout,rotatedaround,ulft,urt,%
4636       llft,lrt,readfrom,write,stroked,filled,textual,clipped,bounded,%
4637       pathpart,penpart,dashpart,textpart,fontpart},%
4638   % keywords[3] = Commands (Table 10)
4639     morekeywords=[3]{addto,clip,cutdraw,draw,drawarrow,drawdblarrow,%
4640       fill,filldraw,interim,let,loggingall,newinternal,pickup,%
4641       save,setbounds,shipout,show,showdependencies,showtoken,%
4642       showvariable,special,tracingall,tracingnone,undraw,unfill,%
4643       unfilldraw,to,also,contour,doublepath,withcolor,withpen,%
4644       dashed,randomseed},%
4645   % keywords[4] = Function-Like Macros (Table 11)
4646     morekeywords=[4]{boxit,boxjoin,bpath,buildcycle,circleit,dashpattern,%
4647       decr,dotlabel,dotlabels,drawboxed,drawboxes,drawoptions,%
4648       drawunboxed,fixpos,fixsize,incr,interpath,label,labels,max,min,pic,%
4649       thelabel,z,image},%
4650   % keywords[5] = Internal and Predefined Variables (Tables 3, 4)
```

```
4651    morekeywords=[5]{ahangle,ahlength,bboxmargin,charcode,circmargin,%
4652        day,defaultdx,defaultdy,defaultpen,defaultscale,labeloffset,%
4653        linecap,linejoin,miterlimit,month,pausing,prologues,showstopping,%
4654        time,tracingcapsules,tracingchoices,tracingcommands,%
4655        tracingequations,tracinglostchars,tracingmacros,tracingonline,%
4656        tracingoutput,tracingrestores,tracingspecs,tracingstats,%
4657        tracingtitles,truecorners,warningcheck,year},
4658    morekeywords=[5]{background,currentpen,currentpicture,cuttings,%
4659        defaultfont},%
4660    % keywords[6] = Predefined Constants (Table 5)
4661    morekeywords=[6]{beveled,black,blue,bp,butt,cc,cm,dd,ditto,down,%
4662        epsilon,evenly,false,fullcircle,green,halfcircle,identity,%
4663        in,infinity,left,mitered,mm,nullpicture,origin,pc,pencircle,%
4664        pt,quartercircle,red,right,rounded,squared,true,unitsquare,%
4665        up,white,withdots},
4666    sensitive=false,%
4667    alsoother={0123456789$},%
4668    morecomment=[l]\%,%
4669    morestring=[mf]{input\ },%
4670    morestring=[b]"%
4671   }[keywords,comments,strings,mf]%

4672 ⟨/lang3⟩
```

2.46   Miranda

Thanks to Peter Bartke for providing the definition.

```
4673 ⟨∗lang2⟩

4674 %%
4675 %% Miranda definition (c) 1998 Peter Bartke
4676 %%
4677 %% Miranda: pure lazy functional language with polymorphic type system,
4678 %%          garbage collection and functions as first class citizens
4679 %%
4680 \lst@definelanguage{Miranda}%
4681   {morekeywords={abstype,div,if,mod,otherwise,readvals,show,type,where,%
4682       with,bool,char,num,sys_message,False,True,Appendfile,Closefile,%
4683       Exit,Stderr,Stdout,System,Tofile,\%include,\%export,\%free,%
4684       \%insert,abs,and,arctan,cjustify,code,concat,const,converse,cos,%
4685       decode,digit,drop,dropwhile,entier,error,exp,filemode,filter,%
4686       foldl,foldl1,foldr,foldr1,force,fst,getenv,hd,hugenum,id,index,%
4687       init,integer,iterate,last,lay,layn,letter,limit,lines,ljustify,%
4688       log,log10,map,map2,max,max2,member,merge,min,min2,mkset,neg,%
4689       numval,or,pi,postfix,product,read,rep,repeat,reverse,rjustify,%
4690       scan,seq,showfloat,shownum,showscaled,sin,snd,sort,spaces,sqrt,%
4691       subtract,sum,system,take,takewhile,tinynum,tl,transpose,undef,%
4692       until,zip2,zip3,zip4,zip5,zip6,zip},%
4693    sensitive,%
4694    morecomment=[l]||,%
```

```
4695    morestring=[b]"%
4696  }[keywords,comments,strings]
```

4697 ⟨/lang2⟩

2.47   Mizar

As you can read below, Adam Grabowski provided this language definition.

4698 ⟨∗lang3⟩

```
4699 %%
4700 %% Mizar definition (c) 2003 Adam Grabowski
4701 %%
4702 %% Mizar is freely available at URL www.mizar.org for the Linux x86,
4703 %% Solaris x86, and Windows operating systems.
4704 %%
4705 \lst@definelanguage{Mizar}%
4706   {otherkeywords={->,(\#,\#),.=),\&},%
4707    morekeywords={vocabulary,constructors,$1,$1,$2,$3,$4,$5,$6,$7,$8,%
4708        @proof,according,aggregate,and,antonym,as,associativity,assume,%
4709        asymmetry,attr,be,begin,being,by,canceled,case,cases,cluster,%
4710        clusters,coherence,commutativity,compatibility,connectedness,%
4711        consider,consistency,constructors,contradiction,correctness,def,%
4712        deffunc,define,definition,definitions,defpred,end,environ,equals,%
4713        ex,exactly,existence,for,from,func,given,hence,hereby,holds,%
4714        idempotence,if,iff,implies,involutiveness,irreflexivity,is,it,%
4715        let,means,mode,non,not,notation,now,of,or,otherwise,over,per,%
4716        pred,prefix,projectivity,proof,provided,qua,reconsider,redefine,%
4717        reflexivity,requirements,reserve,scheme,schemes,section,selector,%
4718        set,st,struct,such,suppose,symmetry,synonym,take,that,the,then,%
4719        theorem,theorems,thesis,thus,to,transitivity,uniqueness,%
4720        vocabulary,where},%
4721    sensitive=t,%
4722    morecomment=[l]::%
4723  }[keywords,comments]%
```

4724 ⟨/lang3⟩

2.48   ML

Thanks to Torben Hoffmann for providing the definition.

4725 ⟨∗lang2⟩

```
4726 %%
4727 %% ML definition (c) 1999 Torben Hoffmann
4728 %%
4729 \lst@definelanguage{ML}%
4730   {morekeywords={abstype,and,andalso,as,case,do,datatype,else,end,%
4731        eqtype,exception,fn,fun,functor,handle,if,in,include,infix,%
4732        infixr,let,local,nonfix,of,op,open,orelse,raise,rec,sharing,sig,%
4733        signature,struct,structure,then,type,val,with,withtype,while},%
```

```
4734    sensitive,%
4735    morecomment=[n]{(*}{*)},%
4736    morestring=[d]"%
4737   }[keywords,comments,strings]
4738 ⟨/lang2⟩
```

2.49   Modula-2

Took data from

- NIKLAUS WIRTH: **Programmieren in Modula-2**, Übers. Guido Pfeiffer; 2.
  Auflage – Berlin; Heidelberg; New York; London; Paris; Tokyo; Hong Kong:
  Springer, 1991; ISBN 3-540-51689-1.

```
4739 ⟨∗lang3⟩

4740 \lst@definelanguage{Modula-2}%
4741   {morekeywords={AND,ARRAY,BEGIN,BY,CASE,CONST,DIV,DO,ELSE,ELSIF,END,%
4742       EXIT,EXPORT,FOR,FROM,IF,IMPLEMENTATION,IMPORT,IN,MOD,MODULE,NOT,%
4743       OF,OR,POINTER,PROCEDURE,QUALIFIED,RECORD,REPEAT,RETURN,SET,THEN,%
4744       TYPE,UNTIL,VAR,WHILE,WITH,ABS,BITSET,BOOLEAN,CAP,CARDINAL,CHAR,%
4745       CHR,DEC,EXCL,FALSE,FLOAT,HALT,HIGH,INC,INCL,INTEGER,LONGCARD,%
4746       LONGINT,LONGREAL,MAX,MIN,NIL,ODD,ORD,PROC,REAL,SIZE,TRUE,TRUNC,%
4747       VAL,DEFINITION,LOOP},% added keywords due to Peter Bartke 99/07/22
4748    sensitive,%
4749    morecomment=[n]{(*}{*)},%
4750    morestring=[d]',%
4751    morestring=[d]"%
4752   }[keywords,comments,strings]

4753 ⟨/lang3⟩
```

2.50   MuPAD

This definition was provided by Christopher Creutzig. Again thanks to Ulrike
Fischer for pointing to a missing @ in \lstdefinelanguage.

```
4754 ⟨∗lang3⟩

4755 \lst@definelanguage{MuPAD}{%
4756    morekeywords={end,next,break,if,then,elif,else,end_if,case,end_case,%
4757       otherwise,for,from,to,step,downto,in,end_for,while,end_while,%
4758       repeat,until,end_repeat,or,and,not,xor,div,mod,union,minus,%
4759       intersect,subset,proc,begin,end_proc,domain,end_domain,category,%
4760       end_category,axiom,end_axiom,quit,delete,frame},%
4761    morekeywords=[2]{NIL,FAIL,TRUE,FALSE,UNKNOWN,I,RD_INF,RD_NINF,%
4762       RD_NAN,name,local,option,save,inherits,of,do},%
4763    otherkeywords={\%if,?,!,:=,<,>,=,<=,<>,>=,==>,<=>,::,..,...,->,%
4764       @,@@,\$},%
4765    sensitive=true,%
4766    morecomment=[l]{//},%
4767    morecomment=[n]{/*}{*/},%
```

```
4768     morestring=[b]",%
4769     morestring=[d]{'}%
4770   }[keywords,comments,strings]
```

4771 ⟨/lang3⟩

2.51   NASTRAN

4772 ⟨*lang3⟩

The definition is from Jeffrey Ratcliffe—except the `MoreSelectCharTable` part
which simulates the keyword BEGIN BULK.

```
4773 \lst@definelanguage{NASTRAN}
4774   {morekeywords={ENDDATA},%
4775     morecomment=[l]$,%
4776     MoreSelectCharTable=%
4777         \lst@CArgX BEGIN\ BULK\relax\lst@CDef{}%
4778         {\lst@ifmode\else \ifnum\lst@length=\z@
4779             \lst@EnterMode{\lst@GPmode}{\lst@modetrue
4780                 \let\lst@currstyle\lst@gkeywords@sty}%
4781          \fi \fi}%
4782         {\ifnum\lst@mode=\lst@GPmode
4783             \lst@XPrintToken \lst@LeaveMode
4784          \fi}%
4785   }[keywords,comments]%
```

4786 ⟨/lang3⟩

2.52   Oberon-2

4787 ⟨*lang3⟩

```
4788 \lst@definelanguage{Oberon-2}%
4789   {morekeywords={ARRAY,BEGIN,BOOLEAN,BY,CASE,CHAR,CONST,DIV,DO,ELSE,%
4790       ELSIF,END,EXIT,FALSE,FOR,IF,IMPORT,IN,INTEGER,IS,LONGINT,%
4791       LONGREAL,LOOP,MOD,MODULE,NIL,OF,OR,POINTER,PROCEDURE,REAL,RECORD,%
4792       REPEAT,RETURN,SET,SHORTINT,THEN,TO,TRUE,TYPE,UNTIL,VAR,WHILE,%
4793       WITH,ABS,ASH,CAP,CHR,COPY,DEC,ENTIER,EXCL,HALT,INC,INCL,LEN,LONG,%
4794       MAX,MIN,NEW,ODD,ORD,SHORT,SIZE},%
4795     sensitive,%
4796     morecomment=[n]{(*}{*)},%
4797     morestring=[d]',%
4798     morestring=[d]"%
4799   }[keywords,comments,strings]
```

4800 ⟨/lang3⟩

2.53   OCL

This definition is based on chapter 7 of the OMG UML standard version 1.3:

- OMG: **OMG Unified Modeling Language Specification**; © 1999 OMG;
  Available at `ftp://ftp.omg.org/pub/docs/ad/99-06-08.pdf`.

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This language is due to Achim D. Brucker.

4801 ⟨∗lang3⟩

```
4802 %%
4803 %% OCL definition (c) 2000 Achim D. Brucker
4804 %%
4805 %% You are allowed to use, modify and distribute this code either under
4806 %% the terms of the LPPL (version 1.0 or later) or the GPL (version 2.0
4807 %% or later).
4808 %%
```

First we define are very decorative style. In the OMG standard only the boolean (infix (?)) operations are highlighted, but I think all OCL-defined operations should be highlighted, because they are *guaranteed* to be side-effect-free (in OCL only side effect free evaluations or path expressions are allowed).

```
4809 \lst@definelanguage[decorative]{OCL}[OMG]{OCL}
4810   {otherkeywords={@pre},%
4811    morendkeywords={name,attributes,associatoinEnds,operations,%
4812      supertypes,allSupertypes,allInstances,oclIsKindOf,oclIsTypeOf,%
4813      oclAsType,oclInState,oclIsNew,evaluationType,abs,floor,round,max,%
4814      min,div,mod,size,concat,toUpper,toLower,substring,includes,%
4815      excludes,count,includesAll,exludesAll,isEmpty,notEmpty,sum,%
4816      exists,forAll,isUnique,sortedBy,iterate,union,intersection,%
4817      including,excluding,symmetricDifference,select,reject,collect,%
4818      asSequence,asBag,asSequence,asSet,append,prepend,subSequence,at,%
4819      first,last,true,false,isQuery}%
4820   }%
```

Remark: "isQuery" is not real OCL, but a important attribute of the underlying UML model.

The dialect called `OMG` is a very spare version. If you use this variant with bold style for first and second order keywords you get the look and feel of the OMG standard. First order keywords are the OCL context declarations (see section 7.3 of the OMG standard):

```
4821 \lst@definelanguage[OMG]{OCL}%
4822     {morekeywords={context,pre,inv,post},%
```

Second order keywords are the operation which are defined for type Boolean (see pages 7-34/35 of the OMG standard) and the let-operation (in principle these are the infix operations):

```
4823     ndkeywords={or,xor,and,not,implies,if,then,else,endif},%
```

Third order keywords are the basic data types as declared in section 7.4 of the OMG standard:

```
4824     morekeywords=[3]{Boolean,Integer,Real,String,Set,Sequence,Bag,%
4825        OclType,OclAny,OclExpression,Enumeration,Collection,},%
4826     sensitive=t,%
4827     morecomment=[l]--,%
4828     morestring=[d]'%
4829     }[keywords,comments,strings]
```

After a bug report by Martin Süßkraut `morerdkeywords` has been changed to the correct optional argument [3].

4830 ⟨/lang3⟩

2.54 Octave

4831 ⟨∗lang1⟩

As you can read below the definition is due to Ulrich G. Wortmann. Additions due to Sebastian Schubert.

```
4832 %%
4833 %% Octave definition (c) 2001,2002 Ulrich G. Wortmann
4834 %%
4835 \lst@definelanguage{Octave}%
4836   {morekeywords={gt,lt,amp,abs,acos,acosh,acot,acoth,acsc,acsch,%
4837       all,angle,ans,any,asec,asech,asin,asinh,atan,atan2,atanh,auread,%
4838       auwrite,axes,axis,balance,bar,bessel,besselk,bessely,beta,%
4839       betainc,betaln,blanks,bone,break,brighten,capture,cart2pol,%
4840       cart2sph,caxis,cd,cdf2rdf,cedit,ceil,chol,cla,clabel,clc,clear,%
4841       clf,clock,close,colmmd,Colon,colorbar,colormap,ColorSpec,colperm,%
4842       comet,comet3,compan,compass,computer,cond,condest,conj,contour,%
4843       contour3,contourc,contrast,conv,conv2,cool,copper,corrcoef,cos,%
4844       cosh,cot,coth,cov,cplxpair,cputime,cross,csc,csch,csvread,%
4845       csvwrite,cumprod,cumsum,cylinder,date,dbclear,dbcont,dbdown,%
4846       dbquit,dbstack,dbstatus,dbstep,dbstop,dbtype,dbup,ddeadv,ddeexec,%
4847       ddeinit,ddepoke,ddereq,ddeterm,ddeunadv,deblank,dec2hex,deconv,%
4848       del2,delete,demo,det,diag,diary,diff,diffuse,dir,disp,dlmread,%
4849       dlmwrite,dmperm,dot,drawnow,echo,eig,ellipj,ellipke,else,elseif,%
4850       end,engClose,engEvalString,engGetFull,engGetMatrix,engOpen,%
4851       engOutputBuffer,engPutFull,engPutMatrix,engSetEvalCallback,%
4852       engSetEvalTimeout,engWinInit,eps,erf,erfc,erfcx,erfinv,%
4853       errorbar,etime,etree,eval,exist,exp,expint,expm,expo,eye,fclose,%
4854       feather,feof,ferror,feval,fft,fft2,fftshift,fgetl,fgets,figure,%
4855       fill,fill3,filter,filter2,find,findstr,finite,fix,flag,fliplr,%
4856       flipud,floor,flops,fmin,fmins,fopen,for,format,fplot,fprintf,%
4857       fread,frewind,fscanf,fseek,ftell,full,function,funm,fwrite,fzero,%
4858       gallery,gamma,gammainc,gammaln,gca,gcd,gcf,gco,get,getenv,%
4859       getframe,ginput,global,gplot,gradient,gray,graymon,grid,griddata,%
4860       gtext,hadamard,hankel,help,hess,hex2dec,hex2num,hidden,hilb,hist,%
4861       hold,home,hostid,hot,hsv,hsv2rgb,if,ifft,ifft2,imag,image,%
4862       imagesc,Inf,info,input,int2str,interp1,interp2,interpft,inv,%
4863       invhilb,isempty,isglobal,ishold,isieee,isinf,isletter,isnan,%
4864       isreal,isspace,issparse,isstr,jet,keyboard,kron,lasterr,lcm,%
4865       legend,legendre,length,lin2mu,line,linspace,load,log,log10,log2,%
4866       loglog,logm,logspace,lookfor,lower,ls,lscov,lu,magic,matClose,%
4867       matDeleteMatrix,matGetDir,matGetFp,matGetFull,matGetMatrix,%
4868       matGetNextMatrix,matGetString,matlabrc,matlabroot,matOpen,%
4869       matPutFull,matPutMatrix,matPutString,max,mean,median,menu,mesh,%
4870       meshc,meshgrid,meshz,mexAtExit,mexCallMATLAB,mexdebug,%
4871       mexErrMsgTxt,mexEvalString,mexFunction,mexGetFull,mexGetMatrix,%
```

```
4872      mexGetMatrixPtr,mexPrintf,mexPutFull,mexPutMatrix,mexSetTrapFlag,%
4873      min,more,movie,moviein,mu2lin,mxCalloc,mxCopyCharacterToPtr,%
4874      mxCopyComplex16ToPtr,mxCopyInteger4ToPtr,mxCopyPtrToCharacter,%
4875      mxCopyPtrToComplex16,mxCopyPtrToInteger4,mxCopyPtrToReal8,%
4876      mxCopyReal8ToPtr,mxCreateFull,mxCreateSparse,mxCreateString,%
4877      mxFree,mxFreeMatrix,mxGetIr,mxGetJc,mxGetM,mxGetN,mxGetName,%
4878      mxGetNzmax,mxGetPi,mxGetPr,mxGetScalar,mxGetString,mxIsComplex,%
4879      mxIsFull,mxIsNumeric,mxIsSparse,mxIsString,mxIsTypeDouble,%
4880      mxSetIr,mxSetJc,mxSetM,mxSetN,mxSetName,mxSetNzmax,mxSetPi,%
4881      mxSetPr,NaN,nargchk,nargin,nargout,newplot,nextpow2,nnls,nnz,%
4882      nonzeros,norm,normest,null,num2str,nzmax,ode23,ode45,orient,orth,%
4883      pack,pascal,patch,path,pause,pcolor,pi,pink,pinv,plot,plot3,%
4884      pol2cart,polar,poly,polyder,polyeig,polyfit,polyval,polyvalm,%
4885      pow2,print,printopt,prism,prod,pwd,qr,qrdelete,qrinsert,quad,%
4886      quad8,quit,quiver,qz,rand,randn,randperm,rank,rat,rats,rbbox,%
4887      rcond,real,realmax,realmin,refresh,rem,reset,reshape,residue,%
4888      return,rgb2hsv,rgbplot,rootobject,roots,rose,rosser,rot90,rotate,%
4889      round,rref,rrefmovie,rsf2csf,save,saxis,schur,sec,sech,semilogx,%
4890      semilogy,set,setstr,shading,sign,sin,sinh,size,slice,sort,sound,%
4891      spalloc,sparse,spaugment,spconvert,spdiags,specular,speye,spfun,%
4892      sph2cart,sphere,spinmap,spline,spones,spparms,sprandn,sprandsym,%
4893      sprank,sprintf,spy,sqrt,sqrtm,sscanf,stairs,startup,std,stem,%
4894      str2mat,str2num,strcmp,strings,strrep,strtok,subplot,subscribe,%
4895      subspace,sum,surf,surface,surfc,surfl,surfnorm,svd,symbfact,%
4896      symmmd,symrcm,tan,tanh,tempdir,tempname,terminal,text,tic,title,%
4897      toc,toeplitz,trace,trapz,tril,triu,type,uicontrol,uigetfile,%
4898      uimenu,uiputfile,unix,unwrap,upper,vander,ver,version,view,%
4899      viewmtx,waitforbuttonpress,waterfall,wavread,wavwrite,what,%
4900      whatsnew,which,while,white,whitebg,who,whos,wilkinson,wk1read,%
4901      stderr,stdout,plot,set,endif,wk1write,xlabel,xor,ylabel,zeros,%
4902      zlabel,zoom,endwhile,endfunction,printf,case,switch,otherwise,%
4903      system,lsode,endfor,error,ones,oneplot,__gnuplot_set__,do,until},%
4904    sensitive=t,%
4905    morecomment=[l]\#,%
4906    morecomment=[l]\#\#,%
4907    morecomment=[l]\%,%
4908    morestring=[m]',%
4909    morestring=[m]"%
4910    }[keywords,comments,strings]
4911 ⟨/lang1⟩
```

2.55 Oz

4912 ⟨*lang2⟩

Thanks to Andres Becerra Sandoval for providing this language definition.

```
4913 %%
4914 %% Oz definition (c) Andres Becerra Sandoval
4915 %%
4916 \lst@definelanguage{Oz}%
4917   {morekeywords={andthen,at,attr,case,catch,choice,class,%
```

```
4918        cond,declare,define,dis,div,else,elsecase,%
4919        elseif,end,export,fail,false,feat,finally,%
4920        from,fun,functor,if,import,in,local,%
4921        lock,meth,mod,not,of,or,orelse,%
4922        prepare,proc,prop,raise,require,self,skip,%
4923        then,thread,true,try,unit},%
4924    sensitive=true,%
4925    morecomment=[l]{\%},%
4926    morecomment=[s]{/*}{*/},%
4927    morestring=[b]",%
4928    morestring=[d]'%
4929   }[keywords,comments,strings]
4930 ⟨/lang2⟩
```

2.56 Pascal

```
4931 ⟨*lang1⟩
```

Thanks to Andreas Stephan for reporting non-keywords alpha, byte, pack and unpack.

```
4932 \lst@definelanguage[XSC]{Pascal}[Standard]{Pascal}
4933   {deletekeywords={alfa,byte,pack,unpack},% 1998 Andreas Stephan
4934    morekeywords={dynamic,external,forward,global,module,nil,operator,%
4935        priority,sum,type,use,dispose,mark,page,release,cimatrix,%
4936        cinterval,civector,cmatrix,complex,cvector,dotprecision,imatrix,%
4937        interval,ivector,rmatrix,rvector,string,im,inf,re,sup,chr,comp,%
4938        eof,eoln,expo,image,ival,lb,lbound,length,loc,mant,maxlength,odd,%
4939        ord,pos,pred,round,rval,sign,substring,succ,trunc,ub,ubound}%
4940    }%
4941 \lst@definelanguage[Borland6]{Pascal}[Standard]{Pascal}
4942   {morekeywords={asm,constructor,destructor,implementation,inline,%
4943        interface,nil,object,shl,shr,string,unit,uses,xor},%
4944    morendkeywords={Abs,Addr,ArcTan,Chr,Concat,Copy,Cos,CSeg,DiskFree,%
4945        DiskSize,DosExitCode,DosVersion,DSeg,EnvCount,EnvStr,Eof,Eoln,%
4946        Exp,FExpand,FilePos,FileSize,Frac,FSearch,GetBkColor,GetColor,%
4947        GetDefaultPalette,GetDriverName,GetEnv,GetGraphMode,GetMaxMode,%
4948        GetMaxX,GetMaxY,GetModeName,GetPaletteSize,GetPixel,GetX,GetY,%
4949        GraphErrorMsg,GraphResult,Hi,ImageSize,InstallUserDriver,%
4950        InstallUserFont,Int,IOResult,KeyPressed,Length,Lo,MaxAvail,%
4951        MemAvail,MsDos,Odd,Ofs,Ord,OvrGetBuf,OvrGetRetry,ParamCount,%
4952        ParamStr,Pi,Pos,Pred,Ptr,Random,ReadKey,Round,SeekEof,SeekEoln,%
4953        Seg,SetAspectRatio,Sin,SizeOf,Sound,SPtr,Sqr,Sqrt,SSeg,Succ,%
4954        Swap,TextHeight,TextWidth,Trunc,TypeOf,UpCase,WhereX,WhereY,%
4955        Append,Arc,Assign,AssignCrt,Bar,Bar3D,BlockRead,BlockWrite,ChDir,%
4956        Circle,ClearDevice,ClearViewPort,Close,CloseGraph,ClrEol,ClrScr,%
4957        Dec,Delay,Delete,DelLine,DetectGraph,Dispose,DrawPoly,Ellipse,%
4958        Erase,Exec,Exit,FillChar,FillEllipse,FillPoly,FindFirst,FindNext,%
4959        FloodFill,Flush,FreeMem,FSplit,GetArcCoords,GetAspectRatio,%
4960        GetDate,GetDefaultPalette,GetDir,GetCBreak,GetFAttr,%
4961        GetFillSettings,GetFTime,GetImage,GetIntVec,GetLineSettings,%
```

```
4962        GetMem,GetPalette,GetTextSettings,GetTime,GetVerify,%
4963        GetViewSettings,GoToXY,Halt,HighVideo,Inc,InitGraph,Insert,%
4964        InsLine,Intr,Keep,Line,LineRel,LineTo,LowVideo,Mark,MkDir,Move,%
4965        MoveRel,MoveTo,MsDos,New,NormVideo,NoSound,OutText,OutTextXY,%
4966        OvrClearBuf,OvrInit,OvrInitEMS,OvrSetBuf,PackTime,PieSlice,%
4967        PutImage,PutPixel,Randomize,Rectangle,Release,Rename,%
4968        RestoreCrtMode,RmDir,RunError,Sector,Seek,SetActivePage,%
4969        SetAllPalette,SetBkColor,SetCBreak,SetColor,SetDate,SetFAttr,%
4970        SetFillPattern,SetFillStyle,SetFTime,SetGraphBufSize,%
4971        SetGraphMode,SetIntVec,SetLineStyle,SetPalette,SetRGBPalette,%
4972        SetTextBuf,SetTextJustify,SetTextStyle,SetTime,SetUserCharSize,%
4973        SetVerify,SetViewPort,SetVisualPage,SetWriteMode,Sound,Str,%
4974        SwapVectors,TextBackground,TextColor,TextMode,Truncate,%
4975        UnpackTime,Val,Window}%
4976    }%
4977 \lst@definelanguage[Standard]{Pascal}%
4978    {morekeywords={alfa,and,array,begin,boolean,byte,case,char,const,div,%
4979        do,downto,else,end,false,file,for,function,get,goto,if,in,%
4980        integer,label,maxint,mod,new,not,of,or,pack,packed,page,program,%
4981        put,procedure,read,readln,real,record,repeat,reset,rewrite,set,%
4982        text,then,to,true,type,unpack,until,var,while,with,write,%
4983        writeln},%
4984    sensitive=f,%
4985    morecomment=[s]{(*}{*)},%
4986    morecomment=[s]{\{}{\}},%
4987    morestring=[d]'%
4988    }[keywords,comments,strings]
4989 ⟨/lang1⟩
```

2.57   Perl

I got the data from `http://www.perl.com`. But I wish to thank Herbert Weinhandl for the book 'Learning Perl'.

```
4990 ⟨∗lang1⟩
4991 \lst@definelanguage{Perl}%
4992    {morekeywords={abs,accept,alarm,atan2,bind,binmode,bless,caller,%
4993        chdir,chmod,chomp,chop,chown,chr,chroot,close,closedir,connect,%
4994        continue,cos,crypt,dbmclose,dbmopen,defined,delete,die,do,dump,%
4995        each,else,elsif,endgrent,endhostent,endnetent,endprotoent,%
4996        endpwent,endservent,eof,eval,exec,exists,exit,exp,fcntl,fileno,%
4997        flock,for,foreach,fork,format,formline,getc,getgrent,getgrgid,%
4998        getgrnam,gethostbyaddr,gethostbyname,gethostent,getlogin,%
4999        getnetbyaddr,getnetbyname,getnetent,getpeername,getpgrp,%
5000        getppid,getpriority,getprotobyname,getprotobynumber,getprotoent,%
5001        getpwent,getpwnam,getpwuid,getservbyname,getservbyport,%
5002        getservent,getsockname,getsockopt,glob,gmtime,goto,grep,hex,if,%
5003        import,index,int,ioctl,join,keys,kill,last,lc,lcfirst,length,%
5004        link,listen,local,localtime,log,lstat,m,map,mkdir,msgctl,msgget,%
5005        msgrcv,msgsnd,my,next,no,oct,open,opendir,ord,pack,package,pipe,%
```

```
5006        pop,pos,print,printf,prototype,push,q,qq,quotemeta,qw,qx,rand,%
5007        read,readdir,readlink,recv,redo,ref,rename,require,reset,return,%
5008        reverse,rewinddir,rindex,rmdir,s,scalar,seek,seekdir,select,%
5009        semctl,semget,semop,send,setgrent,sethostent,setnetent,setpgrp,%
5010        setpriority,setprotoent,setpwent,setservent,setsockopt,shift,%
5011        shmctl,shmget,shmread,shmwrite,shutdown,sin,sleep,socket,%
5012        socketpair,sort,splice,split,sprintf,sqrt,srand,stat,study,sub,%
5013        substr,symlink,syscall,sysopen,sysread,system,syswrite,tell,%
5014        telldir,tie,tied,time,times,tr,truncate,uc,ucfirst,umask,undef,%
5015        unless,unlink,unpack,unshift,untie,until,use,utime,values,vec,%
5016        wait,waitpid,wantarray,warn,while,write,y},%
5017    sensitive,%
5018    morecomment=[l]\#,%
5019    morestring=[b]",%
5020    morestring=[b]',%
5021    MoreSelectCharTable=%
5022        \lst@ReplaceInput{\$\#}{\lst@ProcessOther\$\lst@ProcessOther\#}%
5023    }[keywords,comments,strings]

5024 ⟨/lang1⟩
```

2.58 PHP

Luca Balzerani sent me this language definition.

```
5025 ⟨*lang2⟩

5026 %%
5027 %% PHP definition by Luca Balzerani
5028 %%
5029 \lst@definelanguage{PHP}%
5030    {morekeywords={%
5031 %--- core language
5032        <?,?>,::,break,case,continue,default,do,else,%
5033        elseif,for,foreach,if,include,require,phpinfo,%
5034        switch,while,false,FALSE,true,TRUE,%
5035 %--- apache functions
5036        apache_lookup_uri,apache_note,ascii2ebcdic,ebcdic2ascii,%
5037        virtual,apache_child_terminate,apache_setenv,%
5038 %--- array functions
5039        array,array_change_key_case,array_chunk,array_count_values,%
5040        array_filter,array_flip,array_fill,array_intersect,%
5041        array_keys,array_map,array_merge,array_merge_recursive,%
5042        array_pad,array_pop,array_push,array_rand,array_reverse,%
5043        array_shift,array_slice,array_splice,array_sum,array_unique,%
5044        array_values,array_walk,arsort,asort,compact,count,current,each,%
5045        extract,in_array,array_search,key,krsort,ksort,list,natsort,%
5046        next,pos,prev,range,reset,rsort,shuffle,sizeof,sort,uasort,%
5047        usort,%
5048 %--- aspell functions
5049        aspell_new,aspell_check,aspell_check_raw,aspell_suggest,%
```

```
5050    %--- bc functions
5051        bcadd,bccomp,bcdiv,bcmod,bcmul,bcpow,bcscale,bcsqrt,bcsub,%
5052    %--- bzip2 functions
5053        bzclose,bzcompress,bzdecompress,bzerrno,bzerror,bzerrstr,%
5054        bzopen,bzread,bzwrite,%
5055    %--- calendar functions
5056        JDToGregorian,GregorianToJD,JDToJulian,JulianToJD,JDToJewish,%
5057        JDToFrench,FrenchToJD,JDMonthName,JDDayOfWeek,easter_date,%
5058        unixtojd,jdtounix,cal_days_in_month,cal_to_jd,cal_from_jd,%
5059    %--- ccvs functions
5060        ccvs_init,ccvs_done,ccvs_new,ccvs_add,ccvs_delete,ccvs_auth,%
5061        ccvs_reverse,ccvs_sale,ccvs_void,ccvs_status,ccvs_count,%
5062        ccvs_report,ccvs_command,ccvs_textvalue,%
5063    %--- classobj functions
5064        call_user_method,call_user_method_array,class_exists,get_class,%
5065        get_class_vars,get_declared_classes,get_object_vars,%
5066        is_a,is_subclass_of,method_exists,%
5067    %--- com functions
5068        COM,VARIANT,com_load,com_invoke,com_propget,com_get,com_propput,%
5069        com_set,com_addref,com_release,com_isenum,com_load_typelib,%
5070    %--- cpdf functions
5071        cpdf_add_annotation,cpdf_add_outline,cpdf_arc,cpdf_begin_text,%
5072        cpdf_clip,cpdf_close,cpdf_closepath,cpdf_closepath_fill_stroke,%
5073        cpdf_continue_text,cpdf_curveto,cpdf_end_text,cpdf_fill,%
5074        cpdf_finalize,cpdf_finalize_page,%
5075        cpdf_import_jpeg,cpdf_lineto,cpdf_moveto,cpdf_newpath,cpdf_open,%
5076        cpdf_page_init,cpdf_place_inline_image,cpdf_rect,cpdf_restore,%
5077        cpdf_rmoveto,cpdf_rotate,cpdf_rotate_text,cpdf_save,%
5078        cpdf_scale,cpdf_set_char_spacing,cpdf_set_creator,%
5079        cpdf_set_font,cpdf_set_horiz_scaling,cpdf_set_keywords,%
5080        cpdf_set_page_animation,cpdf_set_subject,cpdf_set_text_matrix,%
5081        cpdf_set_text_rendering,cpdf_set_text_rise,cpdf_set_title,%
5082        cpdf_setdash,cpdf_setflat,cpdf_setgray,cpdf_setgray_fill,%
5083        cpdf_setlinecap,cpdf_setlinejoin,cpdf_setlinewidth,%
5084        cpdf_setrgbcolor,cpdf_setrgbcolor_fill,cpdf_setrgbcolor_stroke,%
5085        cpdf_show_xy,cpdf_stringwidth,cpdf_set_font_directories,%
5086        cpdf_set_viewer_preferences,cpdf_stroke,cpdf_text,%
5087        cpdf_set_action_url,%
5088    %--- crack functions
5089        crack_opendict,crack_closedict,crack_check,crack_getlastmessage,%
5090    %--- ctype functions
5091        ctype_alnum,ctype_alpha,ctype_cntrl,ctype_digit,ctype_lower,%
5092        ctype_print,ctype_punct,ctype_space,ctype_upper,ctype_xdigit,%
5093    %--- curl functions
5094        curl_init,curl_setopt,curl_exec,curl_close,curl_version,%
5095        curl_error,curl_getinfo,%
5096    %--- cybercash functions
5097        cybercash_encr,cybercash_decr,cybercash_base64_encode,%
5098    %--- cybermut functions
5099        cybermut_creerformulairecm,cybermut_testmac,%
```

```
5100  %--- cyrus functions
5101    cyrus_connect,cyrus_authenticate,cyrus_bind,cyrus_unbind,%
5102    cyrus_close,%
5103  %--- datetime functions
5104    checkdate,date,getdate,gettimeofday,gmdate,gmmktime,gmstrftime,%
5105    microtime,mktime,strftime,time,strtotime,%
5106  %--- dbase functions
5107    dbase_create,dbase_open,dbase_close,dbase_pack,dbase_add_record,%
5108    dbase_delete_record,dbase_get_record,%
5109    dbase_numfields,dbase_numrecords,%
5110  %--- dba functions
5111    dba_close,dba_delete,dba_exists,dba_fetch,dba_firstkey,%
5112    dba_nextkey,dba_popen,dba_open,dba_optimize,dba_replace,%
5113  %--- dbm functions
5114    dbmopen,dbmclose,dbmexists,dbmfetch,dbminsert,dbmreplace,%
5115    dbmfirstkey,dbmnextkey,dblist,%
5116  %--- dbx functions
5117    dbx_close,dbx_connect,dbx_error,dbx_query,dbx_sort,dbx_compare,%
5118  %--- dio functions
5119    dio_open,dio_read,dio_write,dio_truncate,dio_stat,dio_seek,%
5120    dio_close,%
5121  %--- dir functions
5122    chroot,chdir,dir,closedir,getcwd,opendir,readdir,rewinddir,%
5123  %--- dotnet functions
5124    dotnet_load,%
5125  %--- errorfunc functions
5126    error_log,error_reporting,restore_error_handler,%
5127    trigger_error,user_error,%
5128  %--- exec functions
5129    escapeshellarg,escapeshellcmd,exec,passthru,system,shell_exec,%
5130  %--- fbsql functions
5131    fbsql_affected_rows,fbsql_autocommit,fbsql_change_user,%
5132    fbsql_commit,fbsql_connect,fbsql_create_db,fbsql_create_blob,%
5133    fbsql_database_password,fbsql_data_seek,fbsql_db_query,%
5134    fbsql_drop_db,fbsql_errno,fbsql_error,fbsql_fetch_array,%
5135    fbsql_fetch_field,fbsql_fetch_lengths,fbsql_fetch_object,%
5136    fbsql_field_flags,fbsql_field_name,fbsql_field_len,%
5137    fbsql_field_table,fbsql_field_type,fbsql_free_result,%
5138    fbsql_list_dbs,fbsql_list_fields,fbsql_list_tables,%
5139    fbsql_num_fields,fbsql_num_rows,fbsql_pconnect,fbsql_query,%
5140    fbsql_read_clob,fbsql_result,fbsql_rollback,fbsql_set_lob_mode,%
5141    fbsql_start_db,fbsql_stop_db,fbsql_tablename,fbsql_warnings,%
5142    fbsql_get_autostart_info,fbsql_hostname,fbsql_password,%
5143    fbsql_username,%
5144  %--- fdf functions
5145    fdf_open,fdf_close,fdf_create,fdf_save,fdf_get_value,%
5146    fdf_next_field_name,fdf_set_ap,fdf_set_status,fdf_get_status,%
5147    fdf_get_file,fdf_set_flags,fdf_set_opt,%
5148    fdf_set_javascript_action,fdf_set_encoding,fdf_add_template,%
5149  %--- filepro functions
```

```
5150    filepro,filepro_fieldname,filepro_fieldtype,filepro_fieldwidth,%
5151    filepro_fieldcount,filepro_rowcount,%
5152 %--- filesystem functions
5153    basename,chgrp,chmod,chown,clearstatcache,copy,delete,dirname,%
5154    diskfreespace,disk_total_space,fclose,feof,fflush,fgetc,fgetcsv,%
5155    fgetss,file_get_contents,file,file_exists,fileatime,filectime,%
5156    fileinode,filemtime,fileowner,fileperms,filesize,filetype,flock,%
5157    fopen,fpassthru,fputs,fread,fscanf,fseek,fstat,ftell,ftruncate,%
5158    set_file_buffer,is_dir,is_executable,is_file,is_link,%
5159    is_writable,is_writeable,is_uploaded_file,link,linkinfo,mkdir,%
5160    parse_ini_file,pathinfo,pclose,popen,readfile,readlink,rename,%
5161    rmdir,stat,lstat,realpath,symlink,tempnam,tmpfile,touch,umask,%
5162 %--- fribidi functions
5163    fribidi_log2vis,%
5164 %--- ftp functions
5165    ftp_connect,ftp_login,ftp_pwd,ftp_cdup,ftp_chdir,ftp_mkdir,%
5166    ftp_nlist,ftp_rawlist,ftp_systype,ftp_pasv,ftp_get,ftp_fget,%
5167    ftp_fput,ftp_size,ftp_mdtm,ftp_rename,ftp_delete,ftp_site,%
5168    ftp_quit,ftp_exec,ftp_set_option,ftp_get_option,%
5169 %--- funchand functions
5170    call_user_func_array,call_user_func,create_function,%
5171    func_get_args,func_num_args,function_exists,%
5172    register_shutdown_function,register_tick_function,%
5173 %--- gettext functions
5174    bindtextdomain,bind_textdomain_codeset,dcgettext,dcngettext,%
5175    dngettext,gettext,ngettext,textdomain,%
5176 %--- gmp functions
5177    gmp_init,gmp_intval,gmp_strval,gmp_add,gmp_sub,gmp_mul,%
5178    gmp_div_r,gmp_div_qr,gmp_div,gmp_mod,gmp_divexact,gmp_cmp,%
5179    gmp_com,gmp_abs,gmp_sign,gmp_fact,gmp_sqrt,gmp_sqrtrm,%
5180    gmp_pow,gmp_powm,gmp_prob_prime,gmp_gcd,gmp_gcdext,gmp_invert,%
5181    gmp_jacobi,gmp_random,gmp_and,gmp_or,gmp_xor,gmp_setbit,%
5182    gmp_scan0,gmp_scan1,gmp_popcount,gmp_hamdist,%
5183 %--- http functions
5184    header,headers_sent,setcookie,%
5185 %--- hw functions
5186    hw_Array2Objrec,hw_Children,hw_ChildrenObj,hw_Close,hw_Connect,%
5187    hw_Deleteobject,hw_DocByAnchor,hw_DocByAnchorObj,%
5188    hw_Document_BodyTag,hw_Document_Content,hw_Document_SetContent,%
5189    hw_ErrorMsg,hw_EditText,hw_Error,hw_Free_Document,hw_GetParents,%
5190    hw_GetChildColl,hw_GetChildCollObj,hw_GetRemote,%
5191    hw_GetSrcByDestObj,hw_GetObject,hw_GetAndLock,hw_GetText,%
5192    hw_GetObjectByQueryObj,hw_GetObjectByQueryColl,%
5193    hw_GetChildDocColl,hw_GetChildDocCollObj,hw_GetAnchors,%
5194    hw_Mv,hw_Identify,hw_InCollections,hw_Info,hw_InsColl,hw_InsDoc,%
5195    hw_InsertObject,hw_mapid,hw_Modifyobject,hw_New_Document,%
5196    hw_Output_Document,hw_pConnect,hw_PipeDocument,hw_Root,%
5197    hw_Who,hw_getusername,hw_stat,hw_setlinkroot,hw_connection_info,%
5198    hw_insertanchors,hw_getrellink,hw_changeobject,%
5199 %--- ibase functions
```

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5200    ibase_connect,ibase_pconnect,ibase_close,ibase_query,%
5201    ibase_fetch_row,ibase_fetch_object,ibase_field_info,%
5202    ibase_free_result,ibase_prepare,ibase_execute,ibase_trans,%
5203    ibase_rollback,ibase_timefmt,ibase_num_fields,ibase_blob_add,%
5204    ibase_blob_close,ibase_blob_create,ibase_blob_echo,%
5205    ibase_blob_import,ibase_blob_info,ibase_blob_open,%
5206  %--- icap functions
5207    icap_open,icap_close,icap_fetch_event,icap_list_events,%
5208    icap_delete_event,icap_snooze,icap_list_alarms,%
5209    icap_rename_calendar,icap_delete_calendar,icap_reopen,%
5210  %--- iconv functions
5211    iconv,iconv_get_encoding,iconv_set_encoding,ob_iconv_handler,%
5212  %--- ifx functions
5213    ifx_connect,ifx_pconnect,ifx_close,ifx_query,ifx_prepare,ifx_do,%
5214    ifx_errormsg,ifx_affected_rows,ifx_getsqlca,ifx_fetch_row,%
5215    ifx_fieldtypes,ifx_fieldproperties,ifx_num_fields,ifx_num_rows,%
5216    ifx_create_char,ifx_free_char,ifx_update_char,ifx_get_char,%
5217    ifx_copy_blob,ifx_free_blob,ifx_get_blob,ifx_update_blob,%
5218    ifx_textasvarchar,ifx_byteasvarchar,ifx_nullformat,%
5219    ifxus_free_slob,ifxus_close_slob,ifxus_open_slob,%
5220    ifxus_seek_slob,ifxus_read_slob,ifxus_write_slob,%
5221  %--- iisfunc functions
5222    iis_get_server_by_path,iis_get_server_by_comment,iis_add_server,%
5223    iis_set_dir_security,iis_get_dir_security,iis_set_server_rights,%
5224    iis_set_script_map,iis_get_script_map,iis_set_app_settings,%
5225    iis_stop_server,iis_stop_service,iis_start_service,%
5226  %--- image functions
5227    exif_imagetype,exif_read_data,exif_thumbnail,getimagesize,%
5228    imagealphablending,imagearc,imagefilledarc,imageellipse,%
5229    imagechar,imagecharup,imagecolorallocate,imagecolordeallocate,%
5230    imagecolorclosest,imagecolorclosestalpha,imagecolorclosestthwb,%
5231    imagecolorexactalpha,imagecolorresolve,imagecolorresolvealpha,%
5232    imagecolorset,imagecolorsforindex,imagecolorstotal,%
5233    imagecopy,imagecopymerge,imagecopymergegray,imagecopyresized,%
5234    imagecreate,imagecreatetruecolor,imagetruecolortopalette,%
5235    imagecreatefromgd2,imagecreatefromgd2part,imagecreatefromgif,%
5236    imagecreatefrompng,imagecreatefromwbmp,imagecreatefromstring,%
5237    imagecreatefromxpm,imagedashedline,imagedestroy,imagefill,%
5238    imagefilledrectangle,imagefilltoborder,imagefontheight,%
5239    imagegd,imagegd2,imagegif,imagepng,imagejpeg,imagewbmp,%
5240    imageline,imageloadfont,imagepalettecopy,imagepolygon,%
5241    imagepsencodefont,imagepsfreefont,imagepsloadfont,%
5242    imagepsslantfont,imagepstext,imagerectangle,imagesetpixel,%
5243    imagesetstyle,imagesettile,imagesetthickness,imagestring,%
5244    imagesx,imagesy,imagettfbbox,imageftbbox,imagettftext,%
5245    imagetypes,jpeg2wbmp,png2wbmp,iptcembed,read_exif_data,%
5246  %--- imap functions
5247    imap_8bit,imap_alerts,imap_append,imap_base64,imap_binary,%
5248    imap_bodystruct,imap_check,imap_clearflag_full,imap_close,%
5249    imap_delete,imap_deletemailbox,imap_errors,imap_expunge,%
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5250    imap_fetchbody,imap_fetchheader,imap_fetchstructure,%
5251    imap_getmailboxes,imap_getsubscribed,imap_header,%
5252    imap_headers,imap_last_error,imap_listmailbox,%
5253    imap_mail,imap_mail_compose,imap_mail_copy,imap_mail_move,%
5254    imap_mime_header_decode,imap_msgno,imap_num_msg,imap_num_recent,%
5255    imap_ping,imap_popen,imap_qprint,imap_renamemailbox,imap_reopen,%
5256    imap_rfc822_parse_headers,imap_rfc822_write_address,%
5257    imap_search,imap_setacl,imap_set_quota,imap_setflag_full,%
5258    imap_status,imap_subscribe,imap_uid,imap_undelete,%
5259    imap_utf7_decode,imap_utf7_encode,imap_utf8,imap_thread,%
5260  %--- info functions
5261    assert,assert_options,extension_loaded,dl,getenv,get_cfg_var,%
5262    get_defined_constants,get_extension_funcs,getmygid,%
5263    get_loaded_extensions,get_magic_quotes_gpc,%
5264    getlastmod,getmyinode,getmypid,getmyuid,get_required_files,%
5265    ini_alter,ini_get,ini_get_all,ini_restore,ini_set,phpcredits,%
5266    phpversion,php_logo_guid,php_sapi_name,php_uname,putenv,%
5267    set_time_limit,version_compare,zend_logo_guid,zend_version,%
5268  %--- ircg functions
5269    ircg_pconnect,ircg_fetch_error_msg,ircg_set_current,ircg_join,%
5270    ircg_msg,ircg_notice,ircg_nick,ircg_topic,ircg_channel_mode,%
5271    ircg_whois,ircg_kick,ircg_ignore_add,ircg_ignore_del,%
5272    ircg_is_conn_alive,ircg_lookup_format_messages,%
5273    ircg_set_on_die,ircg_set_file,ircg_get_username,%
5274    ircg_nickname_unescape,%
5275  %--- java functions
5276    java_last_exception_clear,java_last_exception_get,%
5277  %--- ldap functions
5278    ldap_add,ldap_bind,ldap_close,ldap_compare,ldap_connect,%
5279    ldap_delete,ldap_dn2ufn,ldap_err2str,ldap_errno,ldap_error,%
5280    ldap_first_attribute,ldap_first_entry,ldap_free_result,%
5281    ldap_get_dn,ldap_get_entries,ldap_get_option,ldap_get_values,%
5282    ldap_list,ldap_modify,ldap_mod_add,ldap_mod_del,%
5283    ldap_next_attribute,ldap_next_entry,ldap_read,ldap_rename,%
5284    ldap_set_option,ldap_unbind,ldap_8859_to_t61,%
5285    ldap_next_reference,ldap_parse_reference,ldap_parse_result,%
5286    ldap_sort,ldap_start_tls,ldap_t61_to_8859,%
5287  %--- mail functions
5288    mail,ezmlm_hash,%
5289  %--- math functions
5290    abs,acos,acosh,asin,asinh,atan,atanh,atan2,base_convert,bindec,%
5291    cos,cosh,decbin,dechex,decoct,deg2rad,exp,expm1,floor,%
5292    hexdec,hypot,is_finite,is_infinite,is_nan,lcg_value,log,log10,%
5293    max,min,mt_rand,mt_srand,mt_getrandmax,number_format,octdec,pi,%
5294    rad2deg,rand,round,sin,sinh,sqrt,srand,tan,tanh,%
5295  %--- mbstring functions
5296    mb_language,mb_parse_str,mb_internal_encoding,mb_http_input,%
5297    mb_detect_order,mb_substitute_character,mb_output_handler,%
5298    mb_strlen,mb_strpos,mb_strrpos,mb_substr,mb_strcut,mb_strwidth,%
5299    mb_convert_encoding,mb_detect_encoding,mb_convert_kana,%
```

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5300     mb_decode_mimeheader,mb_convert_variables,%
5301     mb_decode_numericentity,mb_send_mail,mb_get_info,%
5302     mb_ereg,mb_eregi,mb_ereg_replace,mb_eregi_replace,mb_split,%
5303     mb_ereg_search,mb_ereg_search_pos,mb_ereg_search_regs,%
5304     mb_ereg_search_getregs,mb_ereg_search_getpos,%
5305  %--- mcal functions
5306     mcal_open,mcal_popen,mcal_reopen,mcal_close,%
5307     mcal_rename_calendar,mcal_delete_calendar,mcal_fetch_event,%
5308     mcal_append_event,mcal_store_event,mcal_delete_event,%
5309     mcal_list_alarms,mcal_event_init,mcal_event_set_category,%
5310     mcal_event_set_description,mcal_event_set_start,%
5311     mcal_event_set_alarm,mcal_event_set_class,mcal_is_leap_year,%
5312     mcal_date_valid,mcal_time_valid,mcal_day_of_week,%
5313     mcal_date_compare,mcal_next_recurrence,%
5314     mcal_event_set_recur_daily,mcal_event_set_recur_weekly,%
5315     mcal_event_set_recur_monthly_wday,mcal_event_set_recur_yearly,%
5316     mcal_event_add_attribute,mcal_expunge,mcal_week_of_year,%
5317  %--- mcrypt functions
5318     mcrypt_get_cipher_name,mcrypt_get_block_size,%
5319     mcrypt_create_iv,mcrypt_cbc,mcrypt_cfb,mcrypt_ecb,mcrypt_ofb,%
5320     mcrypt_list_modes,mcrypt_get_iv_size,mcrypt_encrypt,%
5321     mcrypt_module_open,mcrypt_module_close,mcrypt_generic_deinit,%
5322     mcrypt_generic,mdecrypt_generic,mcrypt_generic_end,%
5323     mcrypt_enc_is_block_algorithm_mode,%
5324     mcrypt_enc_is_block_mode,mcrypt_enc_get_block_size,%
5325     mcrypt_enc_get_supported_key_sizes,mcrypt_enc_get_iv_size,%
5326     mcrypt_enc_get_modes_name,mcrypt_module_self_test,%
5327     mcrypt_module_is_block_algorithm,mcrypt_module_is_block_mode,%
5328     mcrypt_module_get_algo_key_size,%
5329  %--- mhash functions
5330     mhash_get_hash_name,mhash_get_block_size,mhash_count,mhash,%
5331  %--- misc functions
5332     connection_aborted,connection_status,connection_timeout,%
5333     define,defined,die,eval,exit,get_browser,highlight_file,%
5334     ignore_user_abort,iptcparse,leak,pack,show_source,sleep,uniqid,%
5335     usleep,%
5336  %--- mnogosearch functions
5337     udm_add_search_limit,udm_alloc_agent,udm_api_version,%
5338     udm_cat_list,udm_clear_search_limits,udm_errno,udm_error,%
5339     udm_free_agent,udm_free_ispell_data,udm_free_res,%
5340     udm_get_res_field,udm_get_res_param,udm_load_ispell_data,%
5341     udm_check_charset,udm_check_stored,udm_close_stored,udm_crc32,%
5342  %--- msession functions
5343     msession_connect,msession_disconnect,msession_count,%
5344     msession_destroy,msession_lock,msession_unlock,msession_set,%
5345     msession_uniq,msession_randstr,msession_find,msession_list,%
5346     msession_set_array,msession_listvar,msession_timeout,%
5347     msession_getdata,msession_setdata,msession_plugin,%
5348  %--- msql functions
5349     msql,msql_affected_rows,msql_close,msql_connect,msql_create_db,%
```

```
5350    msql_data_seek,msql_dbname,msql_drop_db,msql_dropdb,msql_error,%
5351    msql_fetch_field,msql_fetch_object,msql_fetch_row,%
5352    msql_field_seek,msql_fieldtable,msql_fieldtype,msql_fieldflags,%
5353    msql_free_result,msql_freeresult,msql_list_fields,%
5354    msql_list_dbs,msql_listdbs,msql_list_tables,msql_listtables,%
5355    msql_num_rows,msql_numfields,msql_numrows,msql_pconnect,%
5356    msql_regcase,msql_result,msql_select_db,msql_selectdb,%
5357  %--- mssql functions
5358    mssql_close,mssql_connect,mssql_data_seek,mssql_fetch_array,%
5359    mssql_fetch_object,mssql_fetch_row,mssql_field_length,%
5360    mssql_field_seek,mssql_field_type,mssql_free_result,%
5361    mssql_min_error_severity,mssql_min_message_severity,%
5362    mssql_num_fields,mssql_num_rows,mssql_pconnect,mssql_query,%
5363    mssql_select_db,mssql_bind,mssql_execute,mssql_fetch_assoc,%
5364    mssql_guid_string,mssql_init,mssql_rows_affected,%
5365  %--- muscat functions
5366    muscat_setup,muscat_setup_net,muscat_give,muscat_get,%
5367  %--- mysql functions
5368    mysql_affected_rows,mysql_change_user,mysql_character_set_name,%
5369    mysql_connect,mysql_create_db,mysql_data_seek,mysql_db_name,%
5370    mysql_drop_db,mysql_errno,mysql_error,mysql_escape_string,%
5371    mysql_fetch_assoc,mysql_fetch_field,mysql_fetch_lengths,%
5372    mysql_fetch_row,mysql_field_flags,mysql_field_name,%
5373    mysql_field_seek,mysql_field_table,mysql_field_type,%
5374    mysql_info,mysql_insert_id,mysql_list_dbs,mysql_list_fields,%
5375    mysql_list_tables,mysql_num_fields,mysql_num_rows,%
5376    mysql_ping,mysql_query,mysql_unbuffered_query,%
5377    mysql_result,mysql_select_db,mysql_tablename,mysql_thread_id,%
5378    mysql_get_host_info,mysql_get_proto_info,mysql_get_server_info,%
5379  %--- network functions
5380    checkdnsrr,closelog,debugger_off,debugger_on,%
5381    fsockopen,gethostbyaddr,gethostbyname,gethostbynamel,getmxrr,%
5382    getprotobynumber,getservbyname,getservbyport,ip2long,long2ip,%
5383    pfsockopen,socket_get_status,socket_set_blocking,%
5384    syslog,%
5385  %--- nis functions
5386    yp_get_default_domain,yp_order,yp_master,yp_match,yp_first,%
5387    yp_errno,yp_err_string,yp_all,yp_cat,%
5388  %--- oci8 functions
5389    OCIDefineByName,OCIBindByName,OCILogon,OCIPLogon,OCINLogon,%
5390    OCIExecute,OCICommit,OCIRollback,OCINewDescriptor,OCIRowCount,%
5391    OCIResult,OCIFetch,OCIFetchInto,OCIFetchStatement,%
5392    OCIColumnName,OCIColumnSize,OCIColumnType,OCIServerVersion,%
5393    OCINewCursor,OCIFreeStatement,OCIFreeCursor,OCIFreeDesc,%
5394    OCIError,OCIInternalDebug,OCICancel,OCISetPrefetch,%
5395    OCISaveLobFile,OCISaveLob,OCILoadLob,OCIColumnScale,%
5396    OCIColumnTypeRaw,OCINewCollection,OCIFreeCollection,%
5397    OCICollAppend,OCICollAssignElem,OCICollGetElem,OCICollMax,%
5398    OCICollTrim,%
5399  %--- oracle functions
```

```
5400    Ora_Bind,Ora_Close,Ora_ColumnName,Ora_ColumnSize,Ora_ColumnType,%
5401    Ora_CommitOff,Ora_CommitOn,Ora_Do,Ora_Error,Ora_ErrorCode,%
5402    Ora_Fetch,Ora_Fetch_Into,Ora_GetColumn,Ora_Logoff,Ora_Logon,%
5403    Ora_Numcols,Ora_Numrows,Ora_Open,Ora_Parse,Ora_Rollback,%
5404  %--- outcontrol functions
5405    flush,ob_start,ob_get_contents,ob_get_length,ob_get_level,%
5406    ob_flush,ob_clean,ob_end_flush,ob_end_clean,ob_implicit_flush,%
5407  %--- ovrimos functions
5408    ovrimos_connect,ovrimos_close,ovrimos_longreadlen,%
5409    ovrimos_execute,ovrimos_cursor,ovrimos_exec,ovrimos_fetch_into,%
5410    ovrimos_result,ovrimos_result_all,ovrimos_num_rows,%
5411    ovrimos_field_name,ovrimos_field_type,ovrimos_field_len,%
5412    ovrimos_free_result,ovrimos_commit,ovrimos_rollback,%
5413  %--- pcntl functions
5414    pcntl_fork,pcntl_signal,pcntl_waitpid,pcntl_wexitstatus,%
5415    pcntl_wifsignaled,pcntl_wifstopped,pcntl_wstopsig,%
5416    pcntl_exec,%
5417  %--- pcre functions
5418    preg_match,preg_match_all,preg_replace,preg_replace_callback,%
5419    preg_quote,preg_grep,Pattern Modifiers,Pattern Syntax,%
5420  %--- pdf functions
5421    pdf_add_annotation,pdf_add_bookmark,pdf_add_launchlink,%
5422    pdf_add_note,pdf_add_outline,pdf_add_pdflink,pdf_add_thumbnail,%
5423    pdf_arc,pdf_arcn,pdf_attach_file,pdf_begin_page,%
5424    pdf_begin_template,pdf_circle,pdf_clip,pdf_close,pdf_closepath,%
5425    pdf_closepath_stroke,pdf_close_image,pdf_close_pdi,%
5426    pdf_concat,pdf_continue_text,pdf_curveto,pdf_delete,%
5427    pdf_endpath,pdf_end_pattern,pdf_end_template,pdf_fill,%
5428    pdf_findfont,pdf_get_buffer,pdf_get_font,pdf_get_fontname,%
5429    pdf_get_image_height,pdf_get_image_width,pdf_get_parameter,%
5430    pdf_get_pdi_value,pdf_get_majorversion,pdf_get_minorversion,%
5431    pdf_initgraphics,pdf_lineto,pdf_makespotcolor,pdf_moveto,%
5432    pdf_open,pdf_open_CCITT,pdf_open_file,pdf_open_gif,%
5433    pdf_open_image_file,pdf_open_jpeg,pdf_open_memory_image,%
5434    pdf_open_pdi_page,pdf_open_png,pdf_open_tiff,pdf_place_image,%
5435    pdf_rect,pdf_restore,pdf_rotate,pdf_save,pdf_scale,pdf_setcolor,%
5436    pdf_setflat,pdf_setfont,pdf_setgray,pdf_setgray_fill,%
5437    pdf_setlinecap,pdf_setlinejoin,pdf_setlinewidth,pdf_setmatrix,%
5438    pdf_setpolydash,pdf_setrgbcolor,pdf_setrgbcolor_fill,%
5439    pdf_set_border_color,pdf_set_border_dash,pdf_set_border_style,%
5440    pdf_set_duration,pdf_set_font,pdf_set_horiz_scaling,%
5441    pdf_set_info_author,pdf_set_info_creator,pdf_set_info_keywords,%
5442    pdf_set_info_title,pdf_set_leading,pdf_set_parameter,%
5443    pdf_set_text_rendering,pdf_set_text_rise,pdf_set_text_matrix,%
5444    pdf_set_word_spacing,pdf_show,pdf_show_boxed,pdf_show_xy,%
5445    pdf_stringwidth,pdf_stroke,pdf_translate,%
5446  %--- pfpro functions
5447    pfpro_init,pfpro_cleanup,pfpro_process,pfpro_process_raw,%
5448  %--- pgsql functions
5449    pg_close,pg_affected_rows,pg_connect,pg_dbname,pg_end_copy,%
```

```
5450    pg_query,pg_fetch_array,pg_fetch_object,pg_fetch_row,%
5451    pg_field_name,pg_field_num,pg_field_prtlen,pg_field_size,%
5452    pg_free_result,pg_last_oid,pg_host,pg_last_notice,pg_lo_close,%
5453    pg_lo_export,pg_lo_import,pg_lo_open,pg_lo_read,pg_lo_seek,%
5454    pg_lo_read_all,pg_lo_unlink,pg_lo_write,pg_num_fields,%
5455    pg_options,pg_pconnect,pg_port,pg_put_line,pg_fetch_result,%
5456    pg_client_encoding,pg_trace,pg_tty,pg_untrace,pg_get_result,%
5457    pg_send_query,pg_cancel_query,pg_connection_busy,%
5458    pg_connection_status,pg_copy_from,pg_copy_to,pg_escape_bytea,%
5459    pg_result_error,%
5460  %--- posix functions
5461    posix_kill,posix_getpid,posix_getppid,posix_getuid,%
5462    posix_getgid,posix_getegid,posix_setuid,posix_seteuid,%
5463    posix_setegid,posix_getgroups,posix_getlogin,posix_getpgrp,%
5464    posix_setpgid,posix_getpgid,posix_getsid,posix_uname,%
5465    posix_ctermid,posix_ttyname,posix_isatty,posix_getcwd,%
5466    posix_getgrnam,posix_getgrgid,posix_getpwnam,posix_getpwuid,%
5467  %--- printer functions
5468    printer_open,printer_abort,printer_close,printer_write,%
5469    printer_set_option,printer_get_option,printer_create_dc,%
5470    printer_start_doc,printer_end_doc,printer_start_page,%
5471    printer_create_pen,printer_delete_pen,printer_select_pen,%
5472    printer_delete_brush,printer_select_brush,printer_create_font,%
5473    printer_select_font,printer_logical_fontheight,%
5474    printer_draw_rectangle,printer_draw_elipse,printer_draw_text,%
5475    printer_draw_chord,printer_draw_pie,printer_draw_bmp,%
5476  %--- pspell functions
5477    pspell_add_to_personal,pspell_add_to_session,pspell_check,%
5478    pspell_config_create,pspell_config_ignore,pspell_config_mode,%
5479    pspell_config_repl,pspell_config_runtogether,%
5480    pspell_new,pspell_new_config,pspell_new_personal,%
5481    pspell_store_replacement,pspell_suggest,%
5482  %--- qtdom functions
5483    qdom_tree,qdom_error,%
5484  %--- readline functions
5485    readline,readline_add_history,readline_clear_history,%
5486    readline_info,readline_list_history,readline_read_history,%
5487  %--- recode functions
5488    recode_string,recode,recode_file,%
5489  %--- regex functions
5490    ereg,ereg_replace,eregi,eregi_replace,split,spliti,sql_regcase,%
5491  %--- sem functions
5492    sem_get,sem_acquire,sem_release,sem_remove,shm_attach,%
5493    shm_remove,shm_put_var,shm_get_var,shm_remove_var,ftok,%
5494  %--- sesam functions
5495    sesam_connect,sesam_disconnect,sesam_settransaction,%
5496    sesam_rollback,sesam_execimm,sesam_query,sesam_num_fields,%
5497    sesam_diagnostic,sesam_fetch_result,sesam_affected_rows,%
5498    sesam_field_array,sesam_fetch_row,sesam_fetch_array,%
5499    sesam_free_result,%
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```
5500    %--- session functions
5501       session_start,session_destroy,session_name,session_module_name,%
5502       session_id,session_register,session_unregister,session_unset,%
5503       session_get_cookie_params,session_set_cookie_params,%
5504       session_encode,session_set_save_handler,session_cache_limiter,%
5505       session_write_close,%
5506    %--- shmop functions
5507       shmop_open,shmop_read,shmop_write,shmop_size,shmop_delete,%
5508    %--- snmp functions
5509       snmpget,snmpset,snmpwalk,snmpwalkoid,snmp_get_quick_print,%
5510       snmprealwalk,%
5511    %--- strings functions
5512       addcslashes,addslashes,bin2hex,chop,chr,chunk_split,%
5513       count_chars,crc32,crypt,echo,explode,get_html_translation_table,%
5514       hebrev,hebrevc,htmlentities,htmlspecialchars,implode,join,%
5515       localeconv,ltrim,md5,md5_file,metaphone,nl_langinfo,nl2br,ord,%
5516       print,printf,quoted_printable_decode,quotemeta,str_rot13,rtrim,%
5517       setlocale,similar_text,soundex,sprintf,strncasecmp,strcasecmp,%
5518       strcmp,strcoll,strcspn,strip_tags,stripcslashes,stripslashes,%
5519       strlen,strnatcmp,strnatcasecmp,strncmp,str_pad,strpos,strrchr,%
5520       strrev,strrpos,strspn,strstr,strtok,strtolower,strtoupper,%
5521       strtr,substr,substr_count,substr_replace,trim,ucfirst,ucwords,%
5522       vsprintf,wordwrap,%
5523    %--- swf functions
5524       swf_openfile,swf_closefile,swf_labelframe,swf_showframe,%
5525       swf_getframe,swf_mulcolor,swf_addcolor,swf_placeobject,%
5526       swf_removeobject,swf_nextid,swf_startdoaction,%
5527       swf_actiongeturl,swf_actionnextframe,swf_actionprevframe,%
5528       swf_actionstop,swf_actiontogglequality,swf_actionwaitforframe,%
5529       swf_actiongotolabel,swf_enddoaction,swf_defineline,%
5530       swf_definepoly,swf_startshape,swf_shapelinesolid,%
5531       swf_shapefillsolid,swf_shapefillbitmapclip,%
5532       swf_shapemoveto,swf_shapelineto,swf_shapecurveto,%
5533       swf_shapearc,swf_endshape,swf_definefont,swf_setfont,%
5534       swf_fontslant,swf_fonttracking,swf_getfontinfo,swf_definetext,%
5535       swf_definebitmap,swf_getbitmapinfo,swf_startsymbol,%
5536       swf_startbutton,swf_addbuttonrecord,swf_oncondition,%
5537       swf_viewport,swf_ortho,swf_ortho2,swf_perspective,swf_polarview,%
5538       swf_pushmatrix,swf_popmatrix,swf_scale,swf_translate,swf_rotate,%
5539    %--- sybase functions
5540       sybase_affected_rows,sybase_close,sybase_connect,%
5541       sybase_fetch_array,sybase_fetch_field,sybase_fetch_object,%
5542       sybase_field_seek,sybase_free_result,sybase_get_last_message,%
5543       sybase_min_error_severity,sybase_min_message_severity,%
5544       sybase_num_fields,sybase_num_rows,sybase_pconnect,sybase_query,%
5545       sybase_select_db,%
5546    %--- uodbc functions
5547       odbc_autocommit,odbc_binmode,odbc_close,odbc_close_all,%
5548       odbc_connect,odbc_cursor,odbc_do,odbc_error,odbc_errormsg,%
5549       odbc_execute,odbc_fetch_into,odbc_fetch_row,odbc_fetch_array,%
```

```
5550    odbc_fetch_object,odbc_field_name,odbc_field_num,%
5551    odbc_field_len,odbc_field_precision,odbc_field_scale,%
5552    odbc_longreadlen,odbc_num_fields,odbc_pconnect,odbc_prepare,%
5553    odbc_result,odbc_result_all,odbc_rollback,odbc_setoption,%
5554    odbc_tableprivileges,odbc_columns,odbc_columnprivileges,%
5555    odbc_primarykeys,odbc_foreignkeys,odbc_procedures,%
5556    odbc_specialcolumns,odbc_statistics,%
5557  %--- url functions
5558    base64_decode,base64_encode,parse_url,rawurldecode,rawurlencode,%
5559    urlencode,%
5560  %--- var functions
5561    doubleval,empty,floatval,gettype,get_defined_vars,%
5562    import_request_variables,intval,is_array,is_bool,is_double,%
5563    is_int,is_integer,is_long,is_null,is_numeric,is_object,is_real,%
5564    is_scalar,is_string,isset,print_r,serialize,settype,strval,%
5565    unset,var_dump,var_export,is_callable,%
5566  %--- vpopmail functions
5567    vpopmail_add_domain,vpopmail_del_domain,%
5568    vpopmail_add_domain_ex,vpopmail_del_domain_ex,%
5569    vpopmail_add_user,vpopmail_del_user,vpopmail_passwd,%
5570    vpopmail_auth_user,vpopmail_alias_add,vpopmail_alias_del,%
5571    vpopmail_alias_get,vpopmail_alias_get_all,vpopmail_error,%
5572  %--- w32api functions
5573    w32api_set_call_method,w32api_register_function,%
5574    w32api_deftype,w32api_init_dtype,%
5575  %--- wddx functions
5576    wddx_serialize_value,wddx_serialize_vars,wddx_packet_start,%
5577    wddx_add_vars,wddx_deserialize,%
5578  %--- xml functions
5579    xml_parser_create,xml_set_object,xml_set_element_handler,%
5580    xml_set_processing_instruction_handler,xml_set_default_handler,%
5581    xml_set_notation_decl_handler,%
5582    xml_parse,xml_get_error_code,xml_error_string,%
5583    xml_get_current_column_number,xml_get_current_byte_index,%
5584    xml_parser_free,xml_parser_set_option,xml_parser_get_option,%
5585    utf8_encode,xml_parser_create_ns,%
5586    xml_set_start_namespace_decl_handler,%
5587  %--- xslt functions
5588    xslt_set_log,xslt_create,xslt_errno,xslt_error,xslt_free,%
5589    xslt_set_sax_handler,xslt_set_scheme_handler,%
5590    xslt_set_base,xslt_set_encoding,xslt_set_sax_handlers,%
5591  %--- yaz functions
5592    yaz_addinfo,yaz_close,yaz_connect,yaz_errno,yaz_error,yaz_hits,%
5593    yaz_database,yaz_range,yaz_record,yaz_search,yaz_present,%
5594    yaz_scan,yaz_scan_result,yaz_ccl_conf,yaz_ccl_parse,%
5595    yaz_wait,yaz_sort,%
5596  %--- zip functions
5597    zip_close,zip_entry_close,zip_entry_compressedsize,%
5598    zip_entry_filesize,zip_entry_name,zip_entry_open,zip_entry_read,%
5599    zip_read,%
```

```
5600  %--- zlib functions
5601    gzclose,gzeof,gzfile,gzgetc,gzgets,gzgetss,gzopen,gzpassthru,%
5602    gzread,gzrewind,gzseek,gztell,gzwrite,readgzfile,gzcompress,%
5603    gzdeflate,gzinflate,gzencode,},%
5604  sensitive,%
5605  morecomment=[l]\#,%
5606  morecomment=[l]//,%
5607  morecomment=[s]{/*}{*/},%
5608  morestring=[b]",%
5609  morestring=[b]'%
5610  }[keywords,comments,strings]

5611 ⟨/lang2⟩
```

2.59   Plasm

Alessio Pace provided the following definition.

```
5612 ⟨∗lang3⟩

5613 \lst@definelanguage{Plasm}%
5614  {sensitive=false,%
5615   morekeywords={aa,abs,ac,acolor,acos,actor,al,alias,align,and,%
5616      animation,animation,appearance,apply,ar,arc,as,asin,assoc,atan,%
5617      axialcamera,axialcameras,basehermite,bbox,bbox,bernstein,%
5618      bernsteinbasis,bezier,beziercurve,beziermanifold,bezierstripe,%
5619      beziersurface,bigger,biggest,bilinearsurface,binormal,%
5620      biquadraticsurface,black,blend,blue,bottom,box,brown,bspize,%
5621      bspline,bsplinebasis,c,cabinet,camera,cart,case,cat,catch,ceil,%
5622      centeredcameras,centralcavalier,char,charseq,choose,circle,%
5623      circumference,class,cmap,color,comp,computecoords,cone,%
5624      conicalsurface,cons,control,convexcoords,convexhull,coonspatch,%
5625      copy,cos,cosh,crease,crosspolytope,cube,cubiccardinal,%
5626      cubiccardinalbasis,cubichermite,cubicubspline,cubicubsplinebasis,%
5627      cuboid,curl,curvature,curve2cspath,curve2mapvect,cyan,cylinder,%
5628      cylindricalsurface,d,deboor,def,depol,depth_sort,depth_test,%
5629      derbernstein,derbernsteinbase,derbezier,determinant,difference,%
5630      differencepr,dim,dimetric,dirproject,displaygraph,displaynubspline,%
5631      displaynurbspline,distl,distr,div,divergence,dodecahedron,dot,down,%
5632      dp,drawedges,drawforks,drawtree,ds,dsphere,dump,dumprep,ellipse,%
5633      embed,end,eq,ex,exp,explode,export,extract_bodies,extract_polygons,%
5634      extract_wires,extrude,extrusion,fact,false,feature,ff,fillcolor,%
5635      filter,finitecone,first,flash,flashani,floor,fontcolor,fontheight,%
5636      fontspacing,fontwidth,fractalsimplex,frame,frame,frameflash,fromto,%
5637      gausscurvature,ge,grad,gradient,gradmap,gray,green,gt,help,hermite,%
5638      hermitebasis,hermitesurface,hexahedron,icosahedron,id,idnt,if,in,%
5639      inarcs,innerprod,inset,insl,insr,intersection,intersectionpr,%
5640      intervals,intmax,intmin,intsto,inv,isa,isanimpol,isbool,ischar,%
5641      isclosedshape,iscloseto,isempty,iseven,isfun,isfunvect,isge,isgt,%
5642      isint,isintneg,isinto,isintpos,isle,islt,ismat,ismatof,isnat,%
5643      isnull,isnum,isnumneg,isnumpos,isodd,isometric,isorthoshape,ispair,%
```

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```
5644        ispoint,ispointseq,ispol,ispoldim,ispolytope,ispurepol,isreal,%
5645        isrealneg,isrealpos,isrealvect,isseq,isseqof,isshape,issimplex,%
5646        issqrmat,isstring,isvect,iszero,jacobian,join,joints,k,last,le,%
5647        left,leftcavalier,len,less,lesseq,lex,lift,light,linecolor,%
5648        linesize,list,ln,load,loadlib,loop,lt,lxmy,magenta,map,mapshapes,%
5649        markersize,mat,matdotprod,material,mathom,max,mean,meanpoint,med,%
5650        merge,mesh,min,minkowski,mirror,mixedprod,mk,mkframe,mkpol,%
5651        mkvector,mkversork,mod,model,move,mul,multextrude,mxby,mxmy,mxty,%
5652        myfont,n,nat2string,neq,ngon,norm2,normalmap,not,nu_grid,nubspline,%
5653        nubsplineknots,nurbspline,nurbsplineknots,octahedron,offset,%
5654        onepoint,open,optimize,or,orange,ord,ortho,orthoproject,orthox,%
5655        orthoy,orthoz,outarcs,outerloop,outerwarp,pairdiff,parallel,%
5656        pascaltriangle,pdiff,pdifference,permutahedron,permutations,%
5657        perspective,perspective,pi,pivotop,plane,planemapping,pmap,%
5658        points2shape,polar,polyline,polymarker,polypoint,power,powerset,%
5659        presort,principalnormal,print,prism,profileprodsurface,%
5660        progressivesum,project,projection,purple,pyramid,q,quadarray,%
5661        quadmesh,quote,r,raise,range,rationalbezier,rationalblend,%
5662        rationalbspline,rationalize,red,rev,reverse,rgbacolor,right,%
5663        rightcavalier,ring,rn,rotatedtext,rotationalsurface,rotn,rtail,%
5664        ruledsurface,rxmy,s,save,scalarmatprod,scalarvectprod,schlegel2d,%
5665        schlegel3d,sdifference,sdifferencepr,segment,sel,setand,setdiff,%
5666        setfontcolor,setor,setxor,sex,shape_0,shape_1,shape2points,%
5667        shape2pol,shapeclosed,shapecomb,shapediff,shapedist,%
5668        shapeinbetweening,shapeinf,shapejoin,shapelen,shapenorm,%
5669        shapenormal,shapeprod,shaperot,shapesum,shapesup,shapezero,shift,%
5670        showprop,sign,signal,simplex,simplexpile,sin,sinh,size,skeleton,%
5671        skew,smaller,smallest,solidifier,solidify,sort,sphere,spline,%
5672        splinesampling,splitcells,splitpols,sqr,sqrt,star,string,%
5673        stringtokens,struct,sub,svg,sweep,t,tail,tan,tangent,tanh,%
5674        tensorprodsurface,tetrahedron,text,texture,textwithattributes,%
5675        thinsolid,threepoints,time,tmax,tmin,top,torus,torusmap,trace,%
5676        trans,tree,trianglefan,trianglestripe,trimetric,true,truncone,tt,%
5677        tube,twopoints,uk,ukpol,ukpolf,union,unionpr,unitvect,unprune,up,%
5678        vect2dtoangle,vect2mat,vectdiff,vectnorm,vectprod,vectsum,view,%
5679        viewmodel,viewmodel,vrml,warp,warp,where,white,with,xcavalier,xor,%
5680        xquadarray,xx,ycavalier,yellow},%
5681      moredirectives={loadlib},%
5682      otherkeywords={-,+,*,**,/,~,|,..,^,\&,\&\&,\#,\#\#},%
5683      morecomment=[s]{\%}{\%},%
5684      morestring=[b]',%
5685      literate={~}{{$\sim$}}{1} {^}{$\wedge$}{1},%
5686    }[keywords,directives,comments,strings]

5687 ⟨/lang3⟩
```

2.60   PL/I

Found the data in

- BERNHARD FISCHER, HERMAN FISCHER: **Structured Programming in**

PL/I and PL/C; Copyright © 1976 by Marcel Dekker, Inc.; ISBN 0-8247-6394-7

```
5688 ⟨∗lang3⟩

5689 \lst@definelanguage{PL/I}{%
5690   morekeywords={ABS, ATAN, AUTOMATIC, AUTO, ATAND, BEGIN, BINARY, BIN, BIT,%
5691     BUILTIN, BY, CALL, CHARACTER, CHAR, CHECK, COLUMN, COL, COMPLEX, CPLX,%
5692     COPY, COS, COSD, COSH, DATA, DATE, DECIMAL, DEC, DECLARE, DCL, DO,%
5693     EDIT, ELSE, END, ENDFILE, ENDPAGE, ENTRY, EXP, EXTERNAL, EXT, FINISH,%
5694     FIXED, FIXEDOVERFLOW, FOFL, FLOAT, FORMAT, GET, GO, GOTO, IF, IMAG,%
5695     INDEX, INITIAL, INIT, INTERNAL, INT, LABEL, LENGTH, LIKE, LINE, LIST,%
5696     LOG, LOG2, LOG10, MAIN, MAX, MIN, MOD, NOCHECK, NOFIXEDOVERFLOW,%
5697     NOFOFL, NOOVERFLOW, NOOFL, NOSIZE, NOUNDERFLOW, NOUFL, NOZERODIVIDE,%
5698     NOZDIV, ON, OPTIONS, OVERFLOW, OFL, PAGE, PICTURE, PROCEDURE, PROC,%
5699     PUT, READ, REPEAT, RETURN, RETURNS, ROUND, SIN, SIND, SINH, SIZE, SKIP,%
5700     SQRT, STATIC, STOP, STRING, SUBSTR, SUM, SYSIN, SYSPRINT, TAN, TAND,%
5701     TANH, THEN, TO, UNDERFLOW, UFL, VARYING, WHILE, WRITE, ZERODIVIDE,%
5702     ZDIV},%
5703   sensitive=f,%
5704   morecomment=[s]{/*}{*/},%
5705   morestring=[d]'%
5706 }[keywords,comments,strings]

5707 ⟨/lang3⟩
```

2.61 PostScript

Herbert Voss provided the following definition, written by Christophe Jorssen provided the following definition.

```
5708 ⟨∗lang3⟩

5709 %%
5710 %% PostScript language definition (c) 2005 Christophe Jorssen.
5711 %%
5712 \lst@definelanguage{PostScript}{%
5713   morekeywords={abs, add, aload, anchorsearch, and, arc, arcn, arct, arcto,%
5714     array, ashow, astore, atan, awidthshow, begin, bind, bitshift,%
5715     bytesavailable, cachestatus, ceiling, charpath, clear, cleartomark,%
5716     cleardictstack, clip, clippath, closefile, closepath, colorimage,%
5717     concat, concatmatrix, condition, copy, copypage, cos, count,%
5718     countdictstack, countexecstack, counttomark, cshow,%
5719     currentblackgeneration, currentcacheparams, currentcmykcolor,%
5720     currentcolor, currentcolorrendering, currentcolorscreen,%
5721     currentcolorspace, currentcolortransfer, currentcontext, currentdash,%
5722     currentdevparams, currentdict, currentfile, currentflat, currentfont,%
5723     currentglobal, currentgray, currentgstate, currenthalftone,%
5724     currenthalftonephase, currenthsbcolor, currentlinecap, currentlinejoin,%
5725     currentlinewidth, currentmatrix, currentmiterlimit,%
5726     currentobjectformat, currentpacking, currentpagedevice, currentpoint,%
5727     currentrgbcolor, currentscreen, currentshared, currentstrokeadjust,%
```

```
5728      currentsystemparams, currenttransfer, currentundercolorremoval,%
5729      currentuserparams, curveto, cvi, cvlit, cvn, cvr, cvrs, cvs, cvx, def,%
5730      defaultmatrix, definefont, defineresource, defineusername,%
5731      defineuserobject, deletefile, detach, deviceinfo, dict, dictstack, div,%
5732      dtransform, dup, echo, eexec, end, eoclip, eofill, eoviewclip, eq,%
5733      erasepage, errordict, exch, exec, execform, execstack, execuserobject,%
5734      executeonly, executive, exit, exp, false, file, filenameforall,%
5735      fileposition, fill, filter, findencoding, findfont, findresource,%
5736      flattenpath, floor, flush, flushfile, FontDirectory, for, forall, fork,%
5737      ge, get, getinterval, globaldict, GlobalFontDirectory, glyphshow,%
5738      grestore, grestoreall, gsave, gstate, gt, identmatrix, idiv,%
5739      idtransform, if, ifelse, image, imagemask, index, ineofill, infill,%
5740      initclip, initgraphics, initmatrix, initviewclip, instroke,%
5741      internaldict, inueofill, inufill, inustroke, invertmatrix,%
5742      ISOLatin1Encoding, itransform, join, kshow, known, languagelevel, le,%
5743      length, lineto, ln, load, lock, log, loop, lt, makefont, makepattern,%
5744      mark, matrix, maxlength, mod, monitor, moveto, mul, ne, neg, newpath,%
5745      noaccess, not, notify, null, nulldevice, or, packedarray, pathbbox,%
5746      pathforall, pop, print, printobject, product, prompt, pstack, put,%
5747      putinterval, quit, rand, rcurveto, read, readhexstring, readline,%
5748      readonly, readstring, realtime, rectclip, rectfill, rectstroke,%
5749      rectviewclip, renamefile, repeat, resetfile, resourceforall,%
5750      resourcestatus, restore, reversepath, revision, rlineto, rmoveto, roll,%
5751      rootfont, rotate, round, rrand, run, save, scale, scalefont, scheck,%
5752      search, selectfont, serialnumber, setbbox, setblackgeneration,%
5753      setcachedevice, setcachedevice2, setcachelimit, setcacheparams,%
5754      setcharwidth, setcmykcolor, setcolor, setcolorrendering,%
5755      setcolorscreen, setcolorspace, setcolortransfer, setdash, setdevparams,%
5756      setfileposition, setflat, setfont, setglobal, setgray, setgstate,%
5757      sethalftone, sethalftonephase, sethsbcolor, setlinecap, setlinejoin,%
5758      setlinewidth, setmatrix, setmiterlimit, setobjectformat, setoverprint,%
5759      setpacking, setpagedevice, setpattern, setrgbcolor, setscreen,%
5760      setshared, setstrokeadjust, setsystemparams, settransfer,%
5761      setucacheparams, setundercolorremoval, setuserparams, setvmthreshold,%
5762      shareddict, show, showpage, sin, sqrt, srand, stack, StandardEncoding,%
5763      start, startjob, status, statusdict, stop, stopped, store, string,%
5764      stringwidth, stroke, strokepath, sub, systemdict, transform, translate,%
5765      true, truncate, type, token, uappend, ucache, ucachestatus, ueofill,%
5766      ufill, undef, upath, userdict, UserObjects, usertime, ustroke,%
5767      ustrokepath, version, viewclip, viewclippath, vmreclaim, vmstatus,%
5768      wait, wcheck, where, widthshow, write, writehexstring, writeobject,%
5769      writestring, wtranslation, xcheck, xor, xshow, xyshow, yield, yshow},%
5770    sensitive,%
5771    morecomment=[l]\%}[keywords,comments]

5772 ⟨/lang3⟩
```

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2.62 POV-Ray

Berthold Höllmann sent me the definition. But I removed `blankstring=false` and `flexiblecolumns=true` from the driver since they have nothing to do with a language definition.

```
5773 ⟨∗lang1⟩

5774 %%
5775 %% POV definition (c) 1999 Berthold H\"ollmann
5776 %%
5777 \lst@definelanguage{POV}%
5778   {morekeywords={abs,absorption,acos,acosh,adaptive,adc_bailout,agate,%
5779       agate_turb,all,alpha,ambient,ambient_light,angle,aperture,append,%
5780       arc_angle,area_light,array,asc,asin,asinh,assumed_gamma,atan,%
5781       atan2,atanh,average,background,bezier_spline,bicubic_patch,%
5782       black_hole,blob,blue,blur_samples,bounded_by,box,boxed,bozo,%
5783       break,brick,brick_size,brightness,brilliance,bumps,bump_map,%
5784       bump_size,camera,case,caustics,ceil,checker,chr,clipped_by,clock,%
5785       clock_delta,color,color_map,colour,colour_map,component,%
5786       composite,concat,cone,confidence,conic_sweep,control0,control1,%
5787       cos,cosh,count,crackle,crand,cube,cubic,cubic_spline,cubic_wave,%
5788       cylinder,cylindrical,debug,declare,default,defined,degrees,%
5789       density,density_file,density_map,dents,difference,diffuse,%
5790       dimensions,dimension_size,direction,disc,distance,%
5791       distance_maximum,div,eccentricity,else,emission,end,error,%
5792       error_bound,exp,extinction,fade_distance,fade_power,falloff,%
5793       falloff_angle,false,fclose,file_exists,filter,finish,fisheye,%
5794       flatness,flip,floor,focal_point,fog,fog_alt,fog_offset,fog_type,%
5795       fopen,frequency,gif,global_settings,gradient,granite,%
5796       gray_threshold,green,height_field,hexagon,hf_gray_16,hierarchy,%
5797       hollow,hypercomplex,if,ifdef,iff,ifndef,image_map,include,int,%
5798       interior,interpolate,intersection,intervals,inverse,ior,irid,%
5799       irid_wavelength,jitter,julia_fractal,lambda,lathe,leopard,%
5800       light_source,linear_spline,linear_sweep,local,location,log,%
5801       looks_like,look_at,low_error_factor,macro,mandel,map_type,marble,%
5802       material,material_map,matrix,max,max_intersections,max_iteration,%
5803       max_trace_level,media,media_attenuation,media_interaction,merge,%
5804       mesh,metallic,min,minimum_reuse,mod,mortar,nearest_count,no,%
5805       normal,normal_map,no_shadow,number_of_waves,object,octaves,off,%
5806       offset,omega,omnimax,on,once,onion,open,orthographic,panoramic,%
5807       perspective,pgm,phase,phong,phong_size,pi,pigment,pigment_map,%
5808       planar,plane,png,point_at,poly,polygon,poly_wave,pot,pow,ppm,%
5809       precision,prism,pwr,quadratic_spline,quadric,quartic,quaternion,%
5810       quick_color,quick_colour,quilted,radial,radians,radiosity,radius,%
5811       rainbow,ramp_wave,rand,range,ratio,read,reciprocal,%
5812       recursion_limit,red,reflection,reflection_exponent,refraction,%
5813       render,repeat,rgb,rgbf,rgbft,rgbt,right,ripples,rotate,roughness,%
5814       samples,scale,scallop_wave,scattering,seed,shadowless,sin,%
5815       sine_wave,sinh,sky,sky_sphere,slice,slope_map,smooth,%
5816       smooth_triangle,sor,specular,sphere,spherical,spiral1,spiral2,%
```

```
5817        spotlight,spotted,sqr,sqrt,statistics,str,strcmp,strength,strlen,%
5818        strlwr,strupr,sturm,substr,superellipsoid,switch,sys,t,tan,tanh,%
5819        text,texture,texture_map,tga,thickness,threshold,tightness,tile2,%
5820        tiles,torus,track,transform,translate,transmit,triangle,%
5821        triangle_wave,true,ttf,turbulence,turb_depth,type,u,%
5822        ultra_wide_angle,undef,union,up,use_color,use_colour,use_index,%
5823        u_steps,v,val,variance,vaxis_rotate,vcross,vdot,version,vlength,%
5824        vnormalize,vrotate,v_steps,warning,warp,water_level,waves,while,%
5825        width,wood,wrinkles,write,x,y,yes,z},%
5826    moredirectives={break,case,debug,declare,default,else,end,fclose,%
5827        fopen,local,macro,read,render,statistics,switch,undef,version,%
5828        warning,write},%
5829    moredelim=*[directive]\#,%
5830    sensitive,%
5831    morecomment=[l]//,%
5832    morecomment=[s]{/*}{*/},%
5833    morestring=[d]",%
5834  }[keywords,directives,comments,strings]
```

5835 ⟨/lang1⟩

2.63 Prolog

Dominique de Waleffe mailed me the data for Prolog. He took the keywords from the LGrind language definition file.

5836 ⟨*lang2⟩

```
5837 %%
5838 %% Prolog definition (c) 1997 Dominique de Waleffe
5839 %%
5840 \lst@definelanguage{Prolog}%
5841   {morekeywords={op,mod,abort,ancestors,arg,ascii,ask,assert,asserta,%
5842       assertz,atom,atomic,char,clause,close,concat,consult,ed,ef,em,%
5843       eof,fail,file,findall,write,functor,getc,integer,is,length,%
5844       listing,load,name,nl,nonvar,not,numbervars,op,or,pp,prin,print,%
5845       private,prompt,putc,ratom,read,read_from_this_file,rename,repeat,%
5846       retract,retractall,save,see,seeing,seen,sh,skip,statistics,%
5847       subgoal_of,system,tab,tell,telling,time,told,trace,true,unload,%
5848       untrace,var,write},%
5849    sensitive=f,%
5850    morecomment=[l]\%,%
5851    morecomment=[s]{/*}{*/},%
5852    morestring=[bd]",%
5853    morestring=[bd]'%
5854  }[keywords,comments,strings]
```

5855 ⟨/lang2⟩

2.64 Promela

Thanks to William ThimblebyPromela for this language definition.

5856 ⟨∗lang3⟩

5857 %%
5858 %% Promela definition (c) 2004 William Thimbleby
5859 %%
5860 \lst@definelanguage{Promela}
5861   {morekeywords={active,assert,atomic,bit,bool,break,byte,chan,d_step,%
5862   Dproctype,do,else,empty,enabled,fi,full,goto,hidden,if,init,int,%
5863   len,mtype,nempty,never,nfull,od,of,pcvalue,printf,priority,%
5864   proctype,provided,run,short,skip,timeout,typedef,unless,unsigned,%
5865   xr,xs,true,false,inline,eval},%
5866   moredirectives={define,ifdef,ifndef,if,if,else,endif,undef,include},%
5867   moredelim=*[directive]\#,%
5868   morecomment=[s]{/*}{*/},%
5869   morestring=[b]"%
5870   }[keywords,comments,strings,directives]%

5871 ⟨/lang3⟩

2.65 PSTricks

PSTricks is a TeX macro package bundle. Herbert Voss provided the following definition.

5872 ⟨∗lang3⟩

5873 %%
5874 %% PSTricks definition (c) 2006 Herbert Voss
5875 %%
5876 \lst@definelanguage{PSTricks}%
5877   {morekeywords={%
5878   begin,end,definecolor,multido,%
5879   KillGlue,DontKillGlue,pslbrace,bsrbrace,psscalebox,psset,pstVerb,pstverb,%
5880   pst@def,psframebox,psclip,endclip,endpspicture,psframe,%
5881 %%   pspicture,%
5882   multirput,multips,Rput,rput,uput,cput,lput,%
5883   newrgbcolor,newgray,newcmykcolor,%
5884 %%
5885 %% pstricks-add
5886   psStep,psgraph,psbrace,psPrintValue,%
5887 %%
5888 %% pst-plot
5889   psvlabel,pshlabel,psplot,psline,pscustom,pscurve,psccurve,%
5890   readdata,savedata,fileplot,dataplot,listplot,%
5891   psecurce,psgraph,parametricplot,%
5892   psellipse,psaxes,ncline,nccurve,psbezier,parabola,%
5893   qdisk,qline,clipbox,endpsclip,%
5894   psgrid,pscircle,pscirclebox,psdiabox,pstribox,%
5895   newpsfontdot,psdot,psdots,%
5896   pspolygon,psdiamond,psoval,pstriangle,%
5897   psarc,psarcn,psellipticarc,psellipticarcn,pswedge,psellipticwedge,%
5898   pcline,pcdiag,pcdiagg,pccurve,pccurve,pcecurve,%

```
5899    scalebox,scaleboxto,psmathboxtrue,everypsbox,psverbboxtrue,overlaybox,%
5900    psoverlay,putoverlaybox,%
5901    newpsstyle,newpsobject,%
5902    moveto,newpath,closepath,stroke,fill,gsave,grestore,msave,mrestore,%
5903    translate,scale,swapaxes,rotate,openshadow,closedshadow,movepath,%
5904    lineto,rlineto,curveto,rcurveto,code,dim,coor,rcoor,file,arrows,%
5905    setcolor,rotateleft,rotateright,rotatedown,%
5906 %%
5907 %% pst-node
5908    nput,naput,nbput,ncput,%
5909    ncarc,ncbox,ncangle,ncangles,ncloop,ncdiag,ncdiagg,ncarcbox,ncbar,%
5910    cnodeput,nccircle,%
5911    pnode,rnode,Rnode,Cnode,cnode,fnode,%
5912    circlenode,ovalnode,trinode,dianode,%
5913    psmatrix,endpsmatrix,psspan,%
5914 %%
5915 %% pst-tree
5916    pstree,Tcircle,TCircle,Ttri,Tn,TC,Tc,Tfan,TR,Tr,Tdia,Toval,Tdot,Tp,Tf,%
5917    skiplevel,skiplevels,endskiplevels,tspace,tlput,%
5918 %%
5919 %% pst-text
5920    pscharpath,pstextpath,%
5921 %%
5922 %% pst-barcode
5923    psbarcode,%
5924 %%
5925 %% pst-coil
5926    psboxfill,pscoil,psCoil,pszigzag,nccoil,%
5927    psshadow,pstilt,psTilt,ThreeDput,%
5928 %%
5929 %% pst-gr3d
5930    PstGridThreeDNodeProcessor,%
5931 %%
5932 %% pst-vue3d
5933    PstGridThreeD,%
5934    AxesThreeD,LineThreeD,DieThreeD,FrameThreeD,SphereCircleThreeD,%
5935    SphereMeridienThreeD,QuadrillageThreeD,TetraedreThreeD,%
5936    PyramideThreeD,ConeThreeD,CylindreThreeD,DodecahedronThreeD,%
5937    ConeThreeD,SphereThreeD,SphereInverseThreeD,DemiSphereThreeD,%
5938    SphereCreuseThreeD,SphereCircledThreeD,PortionSphereThreeD,%
5939    pNodeThreeD,CubeThreeD,%
5940 %%
5941 %% pst-3dplot
5942    pstThreeDCoor, pstThreeDDot, pstThreeDTriangle, pstThreeDCircle,%
5943    pstPlanePut, pstThreeDBox, pstThreeDEllipse, pstThreeDLine,%
5944    pstThreeDPut, pstThreeDNode, pstThreeDSquare, psplotThreeD,%
5945    parametricplotThreeD, fileplotThreeD, dataplotThreeD,%
5946    pstScalePoints,%
5947 %%
5948 %% pst-circ
```

```
5949      resistor,battery,Ucc,Icc,capacitor,coil,diode,Zener,LED,lamp,switch,%
5950      wire,tension,circledipole,multidipole,OA,transistor,Tswitch,%
5951      potentiometer,transformer,optoCoupler,logic,%
5952 %%
5953 %% pst-eucl
5954      pstTriangle,pstMediatorAB,pstInterLL,pstMiddleAB,pstProjection,%
5955      pstCircleOA,pstLineAB,%
5956 %%
5957 %% pst-func
5958      psBessel,psPolynomial,psFourier,psGaussI,psGauss,psSi,pssi,psCi,psci,%
5959 %%
5960 %% pst-infixplot
5961      psPlot,%
5962 %%
5963 %% pst-ob3d
5964      PstDie,PstCube,%
5965 %%
5966 %% pst-poly
5967      PstPolygon,pspolygonbox,%
5968 %%
5969 %% pst-bar
5970      psbarchart,readpsbardata,psbarscale,newpsbarstyle,%
5971 %%
5972 %% pst-lens
5973      PstLens,%
5974 %%
5975 %% pst-geo
5976      WorldMap,WorldMapII,WorldMapThreeD,WorldMapThreeDII,pnodeMap,MapPut,%
5977 %%
5978 %% pst-autoseg
5979      asr,firstnode,merge,massoc,labelmerge,%
5980 %%
5981 %% gastex
5982      node,imark,fmark,rmark,drawqbpedge,drawedge,drawloop,%
5983 %%
5984 %% pst-labo
5985      Distillation,Ballon,%
5986 %%
5987 %% pst-optic
5988      lens,Transform,%
5989 %%
5990 %% pst-light3d
5991      PstLightThreeDText,%
5992 %%
5993 %% calendrier
5994      Calendrier,%
5995 %%
5996 %% pst-osci
5997      Oscillo%
5998    },%
```

```
5999    sensitive,%
6000    alsoother={0123456789$_},%
6001    morecomment=[l]\% %
6002  }[keywords,comments]%
```

```
6003 ⟨/lang3⟩
```

2.66 Python

Michael Weber sent me the definition. He got data from MARK LUTZ: **Program-ming Python**; O'Reilly 1996; ISBN 1-56592-197-6. Stephen Kelly reported some problems that indicated that the comment definitions needed to be moved after the string definitions to work correctly.

In August 2013 Alexis Dimitriadis reworked the definition by supplying the builtins.

```
6004 ⟨*lang1⟩
```

```
6005 %%
6006 %% Python definition (c) 1998 Michael Weber
6007 %% Additional definitions (2013) Alexis Dimitriadis
6008 %%
6009 \lst@definelanguage{Python}{%
6010   morekeywords={access, and, break, class, continue, def, del, elif, else,%
6011     except, exec, finally, for, from, global, if, import, in, is, lambda,%
6012     not, or, pass, print, raise, return, try, while},%
```

Python has a long list of builtin-in functions (http://docs.python.org/2/library/functions.html) and it is a good idea to make them visible in printed code

```
6013   % Built-ins
6014   morekeywords=[2]{abs, all, any, basestring, bin, bool, bytearray,%
6015     callable, chr, classmethod, cmp, compile, complex, delattr, dict, dir,%
6016     divmod, enumerate, eval, execfile, file, filter, float, format,%
6017     frozenset, getattr, globals, hasattr, hash, help, hex, id, input, int,%
6018     isinstance, issubclass, iter, len, list, locals, long, map, max,%
6019     memoryview, min, next, object, oct, open, ord, pow, property, range,%
6020     raw_input, reduce, reload, repr, reversed, round, set, setattr, slice,%
6021     sorted, staticmethod, str, sum, super, tuple, type, unichr, unicode,%
6022     vars, xrange, zip, apply, buffer, coerce, intern},%
6023   sensitive=true,%
6024   morecomment=[l]\#,%
6025   morestring=[b]',%
6026   morestring=[b]",%
```

According to PEP (Python Enhancement Proposals) comment should be distin-guished from documentation strings, so we define

```
6027   morecomment=[s]{'''}{'''},% used for documentation text
6028                           % (mulitiline strings)
6029   morecomment=[s]{"""}{"""},% added by Philipp Matthias Hahn
```

Jürgen Dietel provided an example with a wrong representation of documentation strings, so the two lines above got changed from morestring → morecomment.

Python now supports so called *raw strings* and also Unicode strings. Here is the definition of these strings:

```
6030   morestring=[s]{r'}{'},% 'raw' strings
6031   morestring=[s]{r"}{"},%
6032   morestring=[s]{r'''}{'''},%
6033   morestring=[s]{r"""}{"""},%
6034   morestring=[s]{u'}{'},% unicode strings
6035   morestring=[s]{u"}{"},%
6036   morestring=[s]{u'''}{'''},%
6037   morestring=[s]{u"""}{"""}%
6038 }%
```

Philipp Matthias Hahn added the third comment. eRreuR found a bug using Python and Nicolas Markey informed me about the corresponding thread on fr.comp.text.tex and provided the fix—adding [b] to both morestring declarations.

```
6039 ⟨/lang1⟩
```

Alexis Dimitriadis also proposes the following configuration for printing Python code which simulates colorizing the code as it's done by the IDLE GUI:

```
6040 ⟨*python-prf⟩

6041 \usepackage{xcolor}
6042 \usepackage{textcomp}
6043
6044 %% Actual colors from idlelib/config-highlight.def
6045 %%     --> corrected to ''web-safe''
6046 %% strings  = #00aa00 / 0,170,0      (a darker green)
6047 %% builtins = #900090 / 144,0,144    (purple-ish)
6048 %% keywords = #FF7700 / 255,119,0    (quite close to plain 'orange')
6049 %\definecolor{IDLEorange}{RGB}{255,119,0} % pretty close to real orange
6050 %\definecolor{IDLEpurple}{RGB}{144,0,144}
6051 %\definecolor{IDLEgreen}{RGB}{0,170,0}
6052 %\definecolor{IDLEred}{RGB}{221,0,0}
6053 %% Corrected to ''web-safe''
6054 %\definecolor{orange2}{RGB}{255,102,0}
6055 \definecolor{purple2}{RGB}{153,0,153} % there's actually no standard purple
6056 \definecolor{green2}{RGB}{0,153,0} % a darker green
6057 %\definecolor{red2}{RGB}{221,0,0}
6058
6059 % Except for green and purple, the other colors are pretty good in standard
6060 % hue
6061 \lstdefinestyle{python-idle-code}{%
6062   language=Python,                  % the language
6063   basicstyle=\normalsize\ttfamily,  % size of the fonts for the code
6064   % Color settings to match IDLE style
6065   keywordstyle=\color{orange},      % core keywords
6066   keywordstyle={[2]\color{purple2}}, % built-ins
```

```
6067   stringstyle=\color{green2},%
6068   commentstyle=\color{red},%
6069   upquote=true,                        % requires textcomp
6070 }
6071 % Unimplemented IDLE syntax: function/class names being defined should be
6072 % blue
```

This code is provided in the file `listings-python.prf`, see section 2.4.1 (Preferences) of the listings documentation.

```
6073 ⟨/python-prf⟩
```

2.67   Rexx

Patrick TJ McPhee provided this definition.

```
6074 ⟨*lang2⟩

6075 %%
6076 %% classic rexx listings definition
6077 %% by Patrick TJ McPhee <ptjm@interlog.com>
6078 %%
6079 \lst@definelanguage{Rexx}{%
6080    morekeywords={address,arg,call,do,drop,else,end,exit,if,interpret,%
6081                  iterate,leave,nop,numeric,options,otherwise,parse,%
6082                  procedure,pull,push,queue,return,say,select,signal,then,%
6083                  to,trace,when},%
6084    sensitive=false,%
6085    morecomment=[n]{/*}{*/},%
6086    morestring=[d]{'},%
6087    morestring=[d]{"},%
6088    }[keywords,comments,strings]

6089 ⟨/lang2⟩
```

There are two dialects of Rexx: the one from System Product Interpreter Reference, VM/XA SP Release 1 and Release 2 and the modern version ooRexx (see http://www.oorexx.org/).

2.67.1   Rexx—VM/XA

```
6090 ⟨*lang2⟩

6091 %%
6092 %% REXX keywords from System Product Interpreter Reference, VM/XA SP Release 1
6093 %% and Release 2
6094 \lst@definelanguage[VM/XA]{Rexx}[]{Rexx}{%
6095    morekeywords={all,by,digits,commands,end,engineering,error,errors,expose,%
6096      external,for,form,fuzz,halt,labels,intermediates,negative,normal,novalue,%
6097      on,off,results,scan,scientific,select,source,stream,syntax,until,upper,%
6098      value,var,version,while,with},%
6099    morekeywords=[2]{abbrev,abs,address,bitand,bitor,bitxor,center,centre,%
6100      compare,copies,c2d,c2x,datatype,date,delstr,delword,diag,diagrc,%
```

```
6101        d2c,d2x,errortext,externals,find,format,index,insert,justify,%
6102        lastpos,left,length,linein,lineout,lines,linesize,max,min,overlay,%
6103        pos,queued,random,reverse,rigth,sign,sourceline,space,storage,%
6104        strip,substr,subword,symbol,time,translate,trunc,userid,value,verify,%
6105        word,wordindex,wordlength,words,xrange,x2c,x2d},%
6106     morekeywords=[3]{result,rc,self,sigl,super},%
6107     sensitive=false,%
6108     morestring=[d]",%
6109     morestring=[d]',%
6110     morecomment=[s]{/*}{*/},%
6111 }[keywords,comments,strings]
```

6112 ⟨/lang2⟩

Shmuel (Seymour J.) Metz pointed out the previously unsupported special variables `result` etc.. He also gave the advice to complete the definitions for OORexx in the following section.

2.67.2   ooRexx

6113 ⟨*lang2⟩

```
6114 %%
6115 %% ooREXX keywords (http://www.oorexx.org/)
6116 \lst@definelanguage[]{OORexx}[VM/XA]{Rexx}{%
6117    morekeywords={::annotate, ::attribute, ::class, ::constant, ::method,%
6118      ::options, ::requires, ::resource, ::routine,%
6119      forward, guard, local, loop, raise, strict,%
6120    },%
6121    alsoletter={:},%
6122 }[keywords,comments,strings]
```

6123 ⟨/lang2⟩

Jobst Hoffmann added the following configuration for printing Rexx code which is similar to the colors used by the Fortran preferences file.

6124 ⟨*rexx-prf⟩

```
6125 \usepackage{xcolor}
6126 \usepackage{textcomp}
6127
6128 %% Actual colors from idlelib/config-highlight.def
6129 %%      --> corrected to ''web-safe''
6130 %% strings  = #00aa00 / 0,170,0      (a darker green)
6131 %% builtins = #900090 / 144,0,144    (purple-ish)
6132 %% keywords = #FF7700 / 255,119,0    (quite close to plain 'orange')
6133 %\definecolor{IDLEorange}{RGB}{255,119,0} % pretty close to real orange
6134 %\definecolor{IDLEpurple}{RGB}{144,0,144}
6135 %\definecolor{IDLEgreen}{RGB}{0,170,0}
6136 %\definecolor{IDLEred}{RGB}{221,0,0}
6137 %% Corrected to ''web-safe''
6138 %\definecolor{orange2}{RGB}{255,102,0}
6139 \definecolor{purple2}{RGB}{153,0,153} % there's actually no standard purple
6140 \definecolor{green2}{RGB}{0,153,0} % a darker green
```

```
6141 %\definecolor{red2}{RGB}{221,0,0}
6142
6143 % Except for green and purple, the other colors are pretty good in standard
6144 % hue
6145 \lstdefinestyle{python-idle-code}{%
6146   language=Python,                    % the language
6147   basicstyle=\normalsize\ttfamily,    % size of the fonts for the code
6148   % Color settings to match IDLE style
6149   keywordstyle=\color{orange},        % core keywords
6150   keywordstyle={[2]\color{purple2}},  % built-ins
6151   stringstyle=\color{green2},%
6152   commentstyle=\color{red},%
6153   upquote=true,                       % requires textcomp
6154 }
6155 % Unimplemented IDLE syntax: function/class names being defined should be
6156 % blue
```

This code is provided in the file `listings-rexx.prf`, see section 2.4.1 (Preferences) of the listings documentation.

```
6157 ⟨/rexx-prf⟩
```

2.68   Reduce

was provided by Geraint Paul Bevan.

```
6158 ⟨*lang3⟩
6159 %%
6160 %% Reduce definition (c) 2002 Geraint Paul Bevan
6161 %%
6162 \lst@definelanguage{Reduce}%
6163   {morekeywords={%
6164 %% reserved identifiers
6165  abs,acos,acosh,acot,acoth,acsc,acsch,%
6166  adjprec,algebraic,algint,allbranch,allfac,and,%
6167  antisymmetric,append,arglength,array,asec,asech,%
6168  asin,asinh,atan,atan2,atanh,begin,bfspace,bye,%
6169  card_no,ceiling,clear,clearrules,coeff,coeffn,%
6170  cofactor,combineexpt,combinelogs,comment,comp,%
6171  complex,conj,cons,cont,cos,cosh,cot,coth,cramer,%
6172  cref,csc,csch,decompose,define,defn,deg,demo,den,%
6173  depend,det,df,difference,dilog,display,div,do,e,%
6174  echo,ed,editdef,ei,end,eps,eq,equal,erf,errcont,%
6175  evallhseqp,eval_mode,even,evenp,exp,expandlogs,%
6176  expr,expt,ezgcd,factor,factorial,factorize,fexpr,%
6177  first,fix,fixp,floor,for,forall,foreach,fort,%
6178  fort_width,freeof,fullroots,g,gcd,geq,go,goto,%
6179  greaterp,high_pow,hypot,i,if,ifactor,impart,in,%
6180  index,infinity,infix,input,int,integer,interpol,%
6181  intstr,k,korder,lambda,lcm,lcof,length,leq,lessp,%
6182  let,lhs,linear,linelength,lisp,list,listargp,%
```

```
6183  listargs,ln,load,load_package,log,log10,logb,%
6184  low_pow,lterm,macro,mainvar,mass,mat,match,%
6185  mateigen,matrix,max,mcd,member,memq,min,minus,mkid,%
6186  modular,msg,mshell,multiplicities,nat,neq,nero,%
6187  nextprime,nil,nodepend,noncom,nonzero,nosplit,%
6188  nospur,nullspace,num,numberp,odd,off,on,operator,%
6189  or,order,ordp,out,output,part,pause,period,pf,pi,%
6190  plus,precedence,precise,precision,pret,pri,primep,%
6191  print_precision,procedure,product,quit,quotient,%
6192  random,random_new_seed,rank,rat,ratarg,rational,%
6193  rationalize,ratpri,real,rederr,reduct,remainder,%
6194  remfac,remind,repart,repeat,rest,resultant,retry,%
6195  return,reverse,revpri,rhs,rlisp88,%
6196  root_multiplicity,round,roundall,roundbf,rounded,%
6197  saveas,savestructr,scalar,sec,sech,second,set,%
6198  setmod,setq,share,showrules,showtime,shut,sign,sin,%
6199  sinh,smacro,solve,solvesingular,spur,sqrt,structr,%
6200  sub,sum,symbolic,symmetric,t,tan,tanh,third,time,%
6201  times,tp,tra,trace,trfac,trigform,trint,until,%
6202  varname,vecdim,vector,weight,when,where,while,%
6203  write,ws,wtlevel,%
6204 %% identifiers with spaces
6205 %% for all,for each,go to,such that,%
6206  },%
6207   sensitive=false,%
6208   morecomment=[l]\%,%
6209   morecomment=[s]{COMMENT}{;},%
6210   morecomment=[s]{COMMENT}{$},%
6211   morestring="%
6212  }[keywords,comments,strings]

6213 ⟨/lang3⟩
```

2.69   RSL

Thanks go to Brian Christensen.

```
6214 ⟨∗lang3⟩

6215 %%
6216 %% RSL definition (c) 2004 Brian Christensen
6217 %%
6218 \lst@definelanguage{RSL}%
6219   {morekeywords={Bool,Char,devt_relation,Int,Nat,Real,Text,Unit,abs,any,%
6220       as,axiom,card,case,channel,chaos,class,do,dom,elems,else,elsif,end,%
6221       extend,false,for,hd,hide,if,in,inds,initialise,int,len,let,local,%
6222       object,of,out,post,pre,read,real,rng,scheme,skip,stop,swap,%
6223       test_case,theory,then,tl,true,type,until,use,value,variable,while,%
6224       with,write},%
6225 literate=%
6226 {<}{$<$}{1}%
```

```
6227 {>}{$>$}{1}%
6228 {[}{$[$}{1}%%
6229 {]}{$]$}{1}%%
6230 {^}{{\mbox{$\widehat{\;}$}}}{1}%%
6231 {'}{{\raisebox{1ex}[1ex][0ex]{\protect\scriptsize$\prime$}}}{1}%%
6232 {||}{{\mbox{$\parallel$}}}{2}%%
6233 {|-}{$\vdash$}{1}%%
6234 {|=|}{{\mbox{$\lceil\!\rceil\!\!\!\!\!\!\;\lfloor\!\rfloor$}}}{1}%%
6235 {**}{$\uparrow$}{1}%
6236 {/\\}{$\wedge$}{1}%%
6237 {inter}{$\cap$}{1}%%
6238 {-\\}{$\lambda$}{1}%%
6239 {->}{$\rightarrow$}{1}%%
6240 {-m->}{{\mbox{$\rightarrow \hspace{-2.5\lst@width} _{m}\;$}}}{1}%
6241 {-~m->}{{\mbox{$\stackrel{\sim}{\mbox{$\rightarrow%
6242         \hspace{-2.5\lst@width} _{m}\;$}}$}}}{1}%
6243 {-~->}{{\mbox{$\stackrel{\sim}{\rightarrow}$}}}{1}%%
6244 {-set}{\bf{-set}}{4}%%
6245 {-list}{{$^{\ast}$}}{1}%%
6246 {-inflist}{$^\omega$}{1}%%
6247 {-infset}{{\mbox{{\bf -infset}}}}{7}%
6248 {\#}{$\circ$}{1}%
6249 {:-}{{\raisebox{.4ex}{\tiny $\bullet$}}}{1}%%
6250 {=}{$=$}{1}%%
6251 {==}{$==$}{2}%%
6252 {=>}{$\Rightarrow$}{1}%%
6253 {\ is\protect\^^M}{{$\;\equiv$}}{2}%
6254 {\ is\ }{{$\equiv$}}{3}%%
6255 {\ isin\protect\^^M}{$\;\in$}{2}%%
6256 {~}{$\sim$}{1}%%
6257 {~=}{$\neq$}{1}%%
6258 {~isin}{$\notin$}{1}%%
6259 {+>}{$\mapsto$}{1}%%
6260 {++}{}{1}%
6261 {|^|}{{\mbox{$\lceil\!\rceil$}}}{1}%%
6262 {\\/}{$\vee$}{1}%%
6263 {exists}{$\exists$}{1}%%
6264 {union}{$\cup$}{1}%%
6265 {>=}{$\geq$}{1}%%
6266 {><}{$\times$}{1}%%
6267 {>>}{$\supset$}{1}%
6268 {>>=}{$\supseteq$}{1}%%
6269 {<=}{$\leq$}{1}%%
6270 {<<}{$\subset$}{1}%
6271 {<.}{$\langle$}{1}%%
6272 {<<=}{$\subseteq$}{1}%%
6273 {<->}{$\leftrightarrow$}{1}%%
6274 {[=}{$\sqsubseteq$}{1}%%
6275 {\{=}{$\preceq$}{1}%%
6276 {\ all\protect\^^M}{$\forall$}{2}%%
```

```
6277 {\ all\ }{$\forall$}{3}%%
6278 {!!}{$\dagger$}{1}%%
6279 {always}{$\Box$}{1}%%
6280 {.>}{$\rangle$}{1}%%
6281 {'alpha}{$\alpha$}{1}%
6282 {'beta}{$\beta$}{1}%
6283 {'gamma}{$\gamma$}{1}%
6284 {'delta}{$\delta$}{1}%
6285 {'epsilon}{$\epsilon$}{1}%
6286 {'zeta}{$\zeta$}{1}%
6287 {'eta}{$\eta$}{1}%
6288 {'theta}{$\theta$}{1}%
6289 {'iota}{$\iota$}{1}%
6290 {'kappa}{$\kappa$}{1}%
6291 {'mu}{$\mu$}{1}%
6292 {'nu}{$\nu$}{1}%
6293 {'xi}{$\xi$}{1}%
6294 {'pi}{$\pi$}{1}%
6295 {'rho}{$\rho$}{1}%
6296 {'sigma}{$\sigma$}{1}%
6297 {'tau}{$\tau$}{1}%
6298 {'upsilon}{$\upsilon$}{1}%
6299 {'phi}{$\phi$}{1}%
6300 {'chi}{$\chi$}{1}%
6301 {'psi}{$\psi$}{1}%
6302 {'omega}{$\omega$}{1}%
6303 {'Gamma}{$\Gamma$}{1}%
6304 {'Delta}{$\Delta$}{1}%
6305 {'Theta}{$\Theta$}{1}%
6306 {'Lambda}{$\Lambda$}{1}%
6307 {'Xi}{$\Xi$}{1}%
6308 {'Pi}{$\Pi$}{1}%
6309 {'Sigma}{$\Sigma$}{1}%
6310 {'Upsilon}{$\Upsilon$}{1}%
6311 {'Phi}{$\Phi$}{1}%
6312 {'Psi}{$\Psi$}{1}%
6313 {'Omega}{$\Omega$}{1},%
6314    sensitive=true,%
6315    morecomment=[l]{--},%
6316    morecomment=[s]{/*}{*/}%
6317   }[keywords,comments]%

6318 ⟨/lang3⟩
```

2.70 Ruby

Christian Kaiser provided the initial definition. Xavier Noria replaced the keywords with the keywords from the at the time of writing current stable Ruby version. An erroneous string delimiter was removed following a bug reported on comp.text.tex on 2006/09/01.

Ruby supports string delimiters of the form `%q!...!`, where `!` can be any character, or can be matched braces or parentheses or brackets. The included string definitions include most of the common variants, but are of course not comprehensive.

```
6319 ⟨∗lang2⟩

6320 \lst@definelanguage{Ruby}%
6321   {morekeywords={__FILE__,__LINE__,BEGIN,END,alias,and,begin,break,%
6322       case,class,def,defined?,do,else,elsif,end,ensure,false,for,%
6323       if,in,module,next,nil,not,or,redo,rescue,retry,return,self,%
6324       super,then,true,undef,unless,until,when,while,yield},%
6325   sensitive=true,%
6326   morecomment=[l]\#,%
6327   morecomment=[l]\#\#,%
6328   morecomment=[s]{=BEGIN}{=END},%
6329   morestring=[b]',%
6330   morestring=[b]",%
6331   morestring=[s]{\%q/}{/},%
6332   morestring=[s]{\%q!}{!},%
6333   morestring=[s]{\%q\{}{\}},%
6334   morestring=[s]{\%q(}{)},%
6335   morestring=[s]{\%q[}{]},%
6336   morestring=[s]{\%q-}{-},%
6337   morestring=[s]{\%Q/}{/},%
6338   morestring=[s]{\%Q!}{!},%
6339   morestring=[s]{\%Q\{}{\}},%
6340   morestring=[s]{\%Q(}{)},%
6341   morestring=[s]{\%Q[}{]},%
6342   morestring=[s]{\%Q-}{-}%
6343   }[keywords,comments,strings]
6344 %     \begin{macrocode}
6345 ⟨/lang2⟩
```

2.71   Scilab

Thanks go to Jean-Philippe Grivet.

```
6346 ⟨∗lang1⟩

6347 %%
6348 %% Scilab definition (c) 2002,2003 Jean-Philippe Grivet
6349 %%
6350 \lst@definelanguage{Scilab}%
6351   {morekeywords={abcd,abinv,abort,abs,acoshm,acosh,acosm,acos,addcolor,%
6352       addf,addinter,addmenu,add_edge,add_node,adj2sp,adj_lists,aff2ab,%
6353       amell,analpf,analyze,ans,apropos,arc_graph,arc_number,argn,arhnk,%
6354       arl2,arma2p,armac,armax1,armax,arma,arsimul,artest,articul,ascii,%
6355       asinhm,asinh,asinm,asin,atanhm,atanh,atanm,atan,augment,auread,%
6356       auwrite,balanc,balreal,bandwr,basename,bdiag,besseli,besselj,%
6357       besselk,bessely,best_match,bezout,bifish,bilin,binomial,black,%
6358       bloc2exp,bloc2ss,bode,bool2s,boolean,boucle,break,bstap,buttmag,%
```

```
6359        bvode,cainv,calerf,calfrq,call,canon,casc,case,ccontrg,cdfbet,%
6360        cdfbin,cdfchi,cdfchn,cdffnc,cdff,cdfgam,cdfnbn,cdfnor,cdfpoi,%
6361        cdft,ceil,center,cepstrum,chaintest,chain_struct,champ1,champ,%
6362        chart,chdir,cheb1mag,cheb2mag,check_graph,check_io,chepol,chfact,%
6363        chol,chsolve,circuit,classmarkov,clean,clearfun,clearglobal,%
6364        clear,close,cls2dls,cmb_lin,cmndred,cmoment,code2str,coeff,coffg,%
6365        coff,colcompr,colcomp,colinout,colormap,colregul,companion,comp,%
6366        cond,conj,connex,contour2di,contour2d,contourf,contour,%
6367        contract_edge,contrss,contr,cont_frm,cont_mat,convex_hull,convol,%
6368        convstr,con_nodes,copfac,copy,correl,corr,coshm,cosh,cosm,cos,%
6369        cotg,cothm,coth,covar,csim,cspect,ctr_gram,cumprod,cumsum,%
6370        curblock,cycle_basis,czt,c_link,dasrt,dassl,datafit,date,dbphi,%
6371        dcf,ddp,debug,dec2hex,deff,definedfields,degree,delbpt,%
6372        delete_arcs,delete_nodes,delete,delip,delmenu,demos,denom,%
6373        derivative,derivat,des2ss,des2tf,determ,detr,det,dft,dhinf,%
6374        dhnorm,diag,diary,diff,diophant,dirname,dispbpt,dispfiles,disp,%
6375        dlgamma,double,dragrect,drawaxis,drawlater,drawnow,draw,driver,%
6376        dscr,dsearch,dsimul,dtsi,dt_ility,duplicate,edge_number,%
6377        edit_curv,edit_graph_menus,edit_graph,edit,eigenmarkov,ell1mag,%
6378        elseif,else,emptystr,endfunction,end,eqfir,eqiir,equil1,equil,%
6379        ereduc,erfcx,erfc,erf,errbar,errcatch,errclear,error,eval3dp,%
6380        eval3d,eval,evans,evstr,excel2sci,execstr,exec,exists,exit,expm,%
6381        exp,external,eye,fac3d,factors,faurre,fchamp,fcontour2d,fcontour,%
6382        fec,feedback,feval,ffilt,fftshift,fft,fgrayplot,figure,fileinfo,%
6383        file,filter,findm,findobj,findx0BD,find_freq,find_path,find,%
6384        findABCD,findAC,findBD,findBDK,findR,fit_dat,fix,floor,flts,foo,%
6385        formatman,format,fort,for,fourplan,fplot2d,fplot3d1,fplot3d,%
6386        fprintf,fprintfMat,frep2tf,freq,freson,frexp,frfit,frmag,fscanf,%
6387        fscanfMat,fsfirlin,fsolve,fspecg,fstabst,fstair,ftest,ftuneq,%
6388        fullrfk,fullrf,full,fun2string,funcprot,functions,function,%
6389        funptr,fusee,gainplot,gamitg,gammaln,gamma,gcare,gcd,gcf,%
6390        genfac3d,genlib,genmarkov,gen_net,geom3d,geomean,getblocklabel,%
6391        getcolor,getcurblock,getcwd,getdate,getd,getenv,getfield,getfont,%
6392        getf,getio,getlinestyle,getmark,getpid,getscicosvars,getsymbol,%
6393        getvalue,getversion,get_function_path,get,gfare,gfrancis,girth,%
6394        givens,glever,glist,global,glue,gpeche,graduate,grand,%
6395        graphics_entities,graph_2_mat,graph_center,graph_complement,%
6396        graph_diameter,graph_power,graph_simp,graph_sum,graph_union,%
6397        graph-list,graycolormap,grayplot,graypolarplot,grep,group,%
6398        gr_menu,gschur,gsort,gspec,gstacksize,gtild,g_margin,h2norm,halt,%
6399        hamilton,hankelsv,hank,harmean,havewindow,help,hermit,hess,%
6400        hex2dec,hilb,hinf,hist3d,histplot,horner,host,hotcolormap,%
6401        householder,hrmt,htrianr,hypermat,h_cl,h_inf_st,h_inf,h_norm,%
6402        iconvert,icon_edit,ieee,if,iirgroup,iirlp,iir,ilib_build,%
6403        ilib_compile,ilib_for_link,ilib_gen_gateway,ilib_gen_loader,%
6404        ilib_gen_Make,imag,impl,imrep2ss,imult,im_inv,inistate,input,%
6405        int16,int2d,int32,int3d,int8,intc,intdec,integrate,interpln,%
6406        interp,intersci,intersect,intg,intl,intppty,intsplin,inttrap,%
6407        inttype,int,invr,invsyslin,inv_coeff,inv,iqr,isdef,isdir,isequal,%
6408        iserror,isglobal,isinf,isnan,isoview,isreal,is_connex,jmat,%
```

```
6409        justify,kalm,karmarkar,kernel,keyboard,knapsack,kpure,krac2,%
6410        kroneck,kron,lasterror,lattn,lattp,lcf,lcmdiag,lcm,ldivf,ldiv,%
6411        leastsq,legends,length,leqr,levin,lev,lex_sort,lft,lgfft,library,%
6412        lib,lin2mu,lincos,lindquist,lines,line_graph,linfn,linf,link,%
6413        linmeq,linpro,linsolve,linspace,lin,listfiles,list,lmisolver,%
6414        lmitool,loadmatfile,loadplots,loadwave,load_graph,load,locate,%
6415        log10,log1p,log2,logm,logspace,log,lotest,lqe,lqg2stan,lqg_ltr,%
6416        lqg,lqr,lsq,lsslist,lstcat,lstsize,ltitr,ludel,lufact,luget,%
6417        lusolve,lu,lyap,macglov,macr2lst,macrovar,macro,mad,make_graph,%
6418        make_index,manedit,man,mapsound,markp2ss,matfile2sci,matrix,%
6419        mat_2_graph,maxi,max_cap_path,max_clique,max_flow,max,mclearerr,%
6420        mclose,meanf,mean,median,meof,mese,mesh2d,mfft,mfile2sci,mgeti,%
6421        mgetl,mgetstr,mget,milk_drop,mine,mini,minreal,minss,%
6422        min_lcost_cflow,min_lcost_flow1,min_lcost_flow2,min_qcost_flow,%
6423        min_weight_tree,min,mlist,mode,modulo,moment,mopen,move,%
6424        mps2linpro,mputl,mputstr,mput,mrfit,msd,mseek,mtell,mtlb_load,%
6425        mtlb_mode,mtlb_save,mtlb_sparse,mu2lin,mulf,mvvacov,m_circle,%
6426        names,nand2mean,nanmax,nanmeanf,nanmean,nanmedian,nanmin,%
6427        nanstdev,nansum,narsimul,ndims,nearfloat,nehari,neighbors,%
6428        netclose,netwindows,netwindow,newest,newfun,nextpow2,nf3d,nfreq,%
6429        nlev,nnz,nodes_2_path,nodes_degrees,node_number,noisegen,norm,%
6430        null,numdiff,numer,nyquist,obscont1,obscont,observer,obsvss,%
6431        obsv_mat,obs_gram,odedc,odedi,odeoptions,ode_discrete,ode_root,%
6432        ode,oldload,oldsave,ones,optim,orth,param3d1,param3d,%
6433        paramfplot2d,parrot,part,pathconvert,path_2_nodes,pause,pbig,%
6434        pdiv,pen2ea,pencan,penlaur,perctl,perfect_match,pertrans,pfss,%
6435        phasemag,phc,pinv,pipe_network,playsnd,plot2d1,plot2d2,plot2d3,%
6436        plot2d4,plot2d,plot3d1,plot3d2,plot3d3,plot3d,plotframe,%
6437        plotprofile,plot_graph,plot,plzr,pmodulo,pol2des,pol2str,pol2tex,%
6438        polarplot,polar,polfact,poly,portr3d,portrait,power,ppol,prbs_a,%
6439        predecessors,predef,printf,printing,print,prod,profile,projsl,%
6440        projspec,proj,psmall,pspect,pvm_addhosts,pvm_barrier,pvm_bcast,%
6441        pvm_bufinfo,pvm_config,pvm_delhosts,pvm_error,pvm_exit,%
6442        pvm_f772sci,pvm_getinst,pvm_gettid,pvm_get_timer,pvm_gsize,%
6443        pvm_halt,pvm_joingroup,pvm_kill,pvm_lvgroup,pvm_mytid,pvm_parent,%
6444        pvm_probe,pvm_recv,pvm_reduce,pvm_sci2f77,pvm_send,pvm_set_timer,%
6445        pvm_spawn_independent,pvm_spawn,pvm_start,pvm_tasks,%
6446        pvm_tidtohost,pvm,pwd,p_margin,qassign,qr,quapro,quart,quaskro,%
6447        quit,randpencil,rand,range,rankqr,rank,rat,rcond,rdivf,read4b,%
6448        readb,readc_,readmps,read,real,recur,reglin,regress,remezb,remez,%
6449        repfreq,replot,residu,resume,return,riccati,riccsl,ricc,ric_desc,%
6450        rlist,roots,rotate,round,routh_t,rowcompr,rowcomp,rowinout,%
6451        rowregul,rowshuff,rpem,rref,rtitr,rubberbox,salesman,savewave,%
6452        save_graph,save,scaling,scanf,schur,sci2exp,sci2for,sci2map,%
6453        sciargs,scicosim,scicos,scifunc_block,sd2sci,secto3d,select,%
6454        semidef,sensi,setbpt,seteventhandler,setfield,setmenu,%
6455        setscicosvars,set,sfact,sgrid,shortest_path,showprofile,%
6456        show_arcs,show_graph,show_nodes,sident,signm,sign,simp_mode,simp,%
6457        sincd,sinc,sinc,sinhm,sinh,sinm,sin,size,sm2des,sm2ss,smooth,%
6458        solve,sorder,sort,sound,sp2adj,spaninter,spanplus,spantwo,sparse,%
```

```
6459        spchol,spcompack,specfact,spec,speye,spget,splin,split_edge,%
6460        spones,sprand,sprintf,spzeros,sqroot,sqrtm,sqrt,squarewave,%
6461        square,srfaur,srkf,ss2des,ss2ss,ss2tf,sscanf,sskf,ssprint,ssrand,%
6462        stabil,stacksize,standard_define,standard_draw,standard_input,%
6463        standard_origin,standard_output,startup,stdevf,stdev,steadycos,%
6464        str2code,strange,strcat,strindex,strings,string,stripblanks,%
6465        strong_connex,strong_con_nodes,strsubst,st_deviation,st_ility,%
6466        subf,subgraph,subplot,successors,sum,supernode,sva,svd,svplot,%
6467        sylm,sylv,sysconv,sysdiag,sysfact,syslin,syssize,systems,system,%
6468        systmat,tabul,tangent,tanhm,tanh,tanm,tan,tdinit,testmatrix,%
6469        texprint,tf2des,tf2ss,then,thrownan,timer,time_id,titlepage,%
6470        tk_getdir,tk_getfile,tlist,toeplitz,tokenpos,tokens,trace,%
6471        translatepaths,trans_closure,trans,trfmod,trianfml,tril,trimmean,%
6472        trisolve,triu,trzeros,typename,typeof,type,uicontrol,uimenu,%
6473        uint16,uint32,uint8,ui_observer,ulink,unglue,union,unique,unix_g,%
6474        unix_s,unix_w,unix_x,unix,unobs,unsetmenu,user,varargin,%
6475        varargout,variancef,variance,varn,warning,wavread,wavwrite,%
6476        wcenter,wfir,what,whereami,whereis,where,while,whos,who_user,who,%
6477        wiener,wigner,window,winsid,with_gtk,with_pvm,with_texmacs,%
6478        with_tk,writb,write4b,write,xarcs,xarc,xarrows,xaxis,xbasc,%
6479        xbasimp,xbasr,xchange,xclear,xclea,xclick,xclip,xdel,xend,xfarcs,%
6480        xfarc,xfpolys,xfpoly,xfrect,xgetech,xgetfile,xgetmouse,xget,%
6481        xgraduate,xgrid,xinfo,xinit,xlfont,xload,xname,xnumb,xpause,%
6482        xpolys,xpoly,xrects,xrect,xrpoly,xs2fig,xs2gif,xs2ppm,xs2ps,%
6483        xsave,xsegs,select,xsetech,xsetm,xset,xstringb,xstringl,xstring,%
6484        xtape,xtitle,x_choices,x_choose,x_dialog,x_matrix,x_mdialog,%
6485        x_message_modeless,x_message,yulewalk,zeropen,zeros,zgrid,zpbutt,%
6486        zpch1,zpch2,zpell,mfprintf,mfscanf,mprintf,mscanf,msprintf,%
6487        msscanf,mucomp,%
6488        ABSBLK_f,AFFICH_f,ANDLOG_f,ANIMXY_f,BIGSOM_f,CLINDUMMY_f,CLKIN_f,%
6489        CLKINV_f,CLKOUT_f,CLKOUTV_f,CLKSOM_f,CLKSOMV_f,CLKSPLIT_f,%
6490        CLOCK_f,CLR_f,CLSS_f,CONST_f,COSBLK_f,CURV_f,DELAY_f,DELAYV_f,%
6491        DEMUX_f,DLR_f,DLRADAPT_f,DLSS_f,EVENTSCOPE_f,EVTDLY_f,EVTGEN_f,%
6492        EXPBLK_f,G_make,GAIN_f,GAINBLK_f,GENERAL_f,GENERIC_f,GENSIN_f,%
6493        GENSQR_f,HALT_f,IFTHEL_f,IN_f,INTEGRAL_f,INTRP2BLK_f,INTRPLBLK_f,%
6494        INVBLK_f,LOGBLK_f,LOOKUP_f,Matplot1,Matplot,MAX_f,MCLOCK_f,%
6495        MFCLCK_f,MIN_f,MUX_f,NDcost,NEGTOPOS_f,OUT_f,POSTONEG_f,POWBLK_f,%
6496        PROD_f,QUANT_f,RAND_f,READC_f,REGISTER_f,RELAY_f,RFILE_f,%
6497        ScilabEval,Sfgrayplot,Sgrayplot,SAMPLEHOLD_f,SAT_f,SAWTOOTH_f,%
6498        SCOPE_f,SCOPXY_f,SELECT_f,SINBLK_f,SOM_f,SPLIT_f,STOP_f,SUPER_f,%
6499        TANBLK_f,TCLSS_f,TEXT_f,TIME_f,TK_EvalFile,TK_EvalStr,TK_GetVar,%
6500        TK_SetVar,TRASH_f,WFILE_f,WRITEC_f,ZCROSS_f,%
6501        \%asn,\%helps,\%k,\%sn},%
6502    alsoletter=\%,% chmod
6503    sensitive,%
6504    morecomment=[l]//,%
6505    morestring=[b]",%
6506    morestring=[m]'%
6507  }[keywords,comments,strings]
```

6508 ⟨/lang1⟩

2.72   SHELXL

Thanks to Aidan Philip Heerdegen for mailing this definition.

6509 ⟨∗lang2⟩

```
6510 %%
6511 %% SHELXL definition (c) 1999 Aidan Philip Heerdegen
6512 %%
6513 \lst@definelanguage{SHELXL}%
6514   {morekeywords={TITL,CELL,ZERR,LATT,SYMM,SFAC,DISP,UNIT,LAUE,%
6515       REM,MORE,TIME,END,HKLF,OMIT,SHEL,BASF,TWIN,EXTI,SWAT,%
6516       MERG,SPEC,RESI,MOVE,ANIS,AFIX,HFIX,FRAG,FEND,EXYZ,EADP,%
6517       EQIV,OMIT,CONN,PART,BIND,FREE,DFIX,BUMP,SAME,SADI,CHIV,%
6518       FLAT,DELU,SIMU,DEFS,ISOR,SUMP,L.S.,CGLS,SLIM,BLOC,DAMP,%
6519       WGHT,FVAR,BOND,CONF,MPLA,RTAB,LIST,ACTA,SIZE,TEMP,WPDB,%
6520       FMAP,GRID,PLAN,MOLE},%
6521   sensitive=false,%
6522   alsoother=_,% Makes the syntax highlighting ignore the underscores
6523   morecomment=[l]{! },%
6524   }%
```

6525 ⟨/lang2⟩

2.73   Simula

Took data from

- GÜNTHER LAMPRECHT: **Introduction to SIMULA 67**; Braunschweig; Wiesbaden: Vieweg, 1981

6526 ⟨∗lang3⟩

```
6527 \lst@definelanguage[IBM]{Simula}[DEC]{Simula}{}%

6528 \lst@definelanguage[DEC]{Simula}[67]{Simula}%
6529   {morekeywords={and,eq,eqv,ge,gt,hidden,imp,le,long,lt,ne,not,%
6530       options,or,protected,short}%
6531   }%

6532 \lst@definelanguage[CII]{Simula}[67]{Simula}%
6533   {morekeywords={and,equiv,exit,impl,not,or,stop}}%

6534 \lst@definelanguage[67]{Simula}%
6535   {morekeywords={activate,after,array,at,before,begin,boolean,%
6536       character,class,comment,delay,detach,do,else,end,external,false,%
6537       for,go,goto,if,in,inner,inspect,integer,is,label,name,new,none,%
6538       notext,otherwise,prior,procedure,qua,reactivate,real,ref,resume,%
6539       simset,simulation,step,switch,text,then,this,to,true,until,value,%
6540       virtual,when,while},%
6541   sensitive=f,%
6542   keywordcommentsemicolon={end}{else,end,otherwise,when}{comment},%
6543   morestring=[d]",%
```

```
6544    morestring=[d]'%
6545    }[keywords,keywordcomments,strings]
```

6546 ⟨/lang3⟩

2.74   SPARQL

This definition for the SPARQL query language (SPARQL Protocol and RDF Query Language, http://www.w3.org/TR/rdf-sparql-query/) was provided by Christoph Kiefer.

6547 ⟨∗lang3⟩

```
6548 %%
6549 %% SPARQL definition (c) 2006 Christoph Kiefer
6550 %%
6551 \lst@definelanguage{SPARQL}%
6552    {morekeywords={BASE,PREFIX,SELECT,DISTINCT,CONSTRUCT,DESCRIBE,ASK,%
6553         FROM,NAMED,WHERE,ORDER,BY,ASC,DESC,LIMIT,OFFSET,OPTIONAL,%
6554         GRAPH,UNION,FILTER,a,STR,LANG,LANGMATCHES,DATATYPE,BOUND,%
6555         isIRI,isURI,isBLANK,isLITERAL,REGEX,true,false},%
6556    sensitive=false,%
6557    morecomment=[l]\#,%
6558    morestring=[d]',%
6559    morestring=[d]"%
6560    }[keywords,comments,strings]
```

6561 ⟨/lang3⟩

2.75   SQL

Data come from Christian Haul. Neil Conway added some keywords, ditto Torsten Flatter, Robert Frank and Dirk Jesko. Hilmar Preuße informed about an issue mentioned at https://bugs.debian.org/626521, the issue got corrected.

6562 ⟨∗lang1⟩

```
6563 %%
6564 %% SQL definition (c) 1998 Christian Haul
6565 %%              (c) 2002 Neil Conway
6566 %%              (c) 2002 Robert Frank
6567 %%              (c) 2003 Dirk Jesko
6568 %%
6569 \lst@definelanguage{SQL}%
6570    {morekeywords={ABSOLUTE,ACTION,ADD,ALLOCATE,ALTER,ARE,AS,ASSERTION,%
6571         AT,BEGIN,BETWEEN,BIT_LENGTH,BOTH,BY,CASCADE,CASCADED,CASE,CAST,%
6572         CATALOG,CHAR_LENGTH,CHARACTER_LENGTH,CLUSTER,COALESCE,%
6573         COLLATE,COLLATION,COLUMN,CONNECT,CONNECTION,CONSTRAINT,%
6574         CONSTRAINTS,CONVERT,CORRESPONDING,CREATE,CROSS,CURRENT_DATE,%
6575         CURRENT_TIME,CURRENT_TIMESTAMP,CURRENT_USER,DAY,DEALLOCATE,%
6576         DEC,DEFERRABLE,DEFERED,DESCRIBE,DESCRIPTOR,DIAGNOSTICS,%
6577         DISCONNECT,DOMAIN,DROP,ELSE,END,EXEC,EXCEPT,EXCEPTION,EXECUTE,%
6578         EXTERNAL,EXTRACT,FALSE,FIRST,FOREIGN,FROM,FULL,GET,GLOBAL,%
```

```
6579        GRAPHIC,HAVING,HOUR,IDENTITY,IMMEDIATE,INDEX,INITIALLY,INNER,%
6580        INPUT,INSENSITIVE,INSERT,INTO,INTERSECT,INTERVAL,%
6581        ISOLATION,JOIN,KEY,LAST,LEADING,LEFT,LEVEL,LIMIT,LOCAL,LOWER,%
6582        MATCH,MINUTE,MONTH,NAMES,NATIONAL,NATURAL,NCHAR,NEXT,NO,NOT,NULL,%
6583        NULLIF,OCTET_LENGTH,ON,ONLY,ORDER,ORDERED,OUTER,OUTPUT,OVERLAPS,%
6584        PAD,PARTIAL,POSITION,PREPARE,PRESERVE,PRIMARY,PRIOR,READ,%
6585        RELATIVE,RESTRICT,REVOKE,RIGHT,ROWS,SCROLL,SECOND,SELECT,SESSION,%
6586        SESSION_USER,SIZE,SPACE,SQLSTATE,SUBSTRING,SYSTEM_USER,%
6587        TABLE,TEMPORARY,THEN,TIMEZONE_HOUR,%
6588        TIMEZONE_MINUTE,TRAILING,TRANSACTION,TRANSLATE,TRANSLATION,TRIM,%
6589        TRUE,UNIQUE,UNKNOWN,UPPER,USAGE,USING,VALUE,VALUES,%
6590        VARGRAPHIC,VARYING,WHEN,WHERE,WRITE,YEAR,ZONE,%
6591        AND,ASC,avg,CHECK,COMMIT,count,DECODE,DESC,DISTINCT,GROUP,IN,% FF
6592        LIKE,NUMBER,ROLLBACK,SUBSTR,sum,VARCHAR2,% FF
6593        MIN,MAX,UNION,UPDATE,% RF
6594        ALL,ANY,CUBE,CUBE,DEFAULT,DELETE,EXISTS,GRANT,OR,RECURSIVE,% DJ
6595        ROLE,ROLLUP,SET,SOME,TRIGGER,VIEW},% DJ
6596     morendkeywords={BIT,BLOB,CHAR,CHARACTER,CLOB,DATE,DECIMAL,FLOAT,% DJ
6597        INT,INTEGER,NUMERIC,SMALLINT,TIME,TIMESTAMP,VARCHAR},% moved here
6598     sensitive=false,% DJ
6599     morecomment=[l]--,%
6600     morecomment=[s]{/*}{*/},%
6601     morestring=[d]',%
6602     morestring=[d]"%
6603   }[keywords,comments,strings]

6604 ⟨/lang1⟩
```

2.76 Swift

The definition for Swift was provided by Stefan Jager.

```
6605 ⟨*lang3⟩

6606 \lst@definelanguage{Swift}{%
6607   morekeywords={associatedtype,class,deinit,enum,extension,fileprivate,%
6608     func,import,init,inout,internal,let,open,operator,private,protocol,%
6609     public,static,struct,subscript,typealias,var,break,case,continue,%
6610     default,defer,do,else,fallthrough,for,guard,if,in,repeat,return,%
6611     switch,where,while,as,Any,catch,false,is,nil,rethrows,super,self,%
6612     Self,throw,throws,true,try,_,associativity,convenience,dynamic,%
6613     didSet,final,get,infix,indirect,lazy,left,mutating,none,%
6614     nonmutating,optional,override,postfix,precedence,prefix,Protocol,%
6615     required,right,set,Type,unowned,weak,willSet},%
6616   sensitive,%
6617   morecomment=[s]{/*}{*/},%
6618   morecomment=[s]{/**}{*/},%
6619   morecomment=[l]//,%
6620   morecomment=[l]///,%
6621   morestring=[b]",%
6622   morestring=[b]""",%
```

```
6623    moredelim=*[directive]\#,%
6624    moredirectives={available,colorLiteral,column,else,elseif,endif,file,%
6625      fileLiteral,function,if,imageLiteral,line,selector,sourceLocation}%
6626  }[keywords,comments,strings,directives]%
```

6627 ⟨/lang3⟩

2.77 Tcl/Tk

Tcl/Tk is a very dynamic language. A statical analysis might not be adequate. Nevertheless the following definitions produce the desired result for my programs with a minimum of "misses".

Data come from

- WELCH, BRENT B.: **Practical Programming in Tcl and Tk**; © 1997 Prentice Hall, Inc.; ISBN 0-13-616830-2.

- OUSTERHOUT, JOHN K.: **Tcl and the Tk Toolkit**; © 1997 Addison-Wesley Publishing Company; ISBN 0-201-6337-X.

Gerd Neugebauer added support for Tcl/Tk.

6628 ⟨∗lang2⟩

```
6629 %%
6630 %% Tcl/Tk definition (c) Gerd Neugebauer
6631 %%
6632 \lst@definelanguage[tk]{tcl}[]{tcl}%
6633   {morekeywords={activate,add,separator,radiobutton,checkbutton,%
6634       command,cascade,all,bell,bind,bindtags,button,canvas,canvasx,%
6635       canvasy,cascade,cget,checkbutton,config,configu,configur,%
6636       configure,clipboard,create,arc,bitmap,image,line,oval,polygon,%
6637       rectangle,text,textwindow,curselection,delete,destroy,end,entry,%
6638       entrycget,event,focus,font,actual,families,measure,metrics,names,%
6639       frame,get,grab,current,release,status,grid,columnconfigure,%
6640       rowconfigure,image,image,create,bitmap,photo,delete,height,types,%
6641       widt,names,index,insert,invoke,itemconfigure,label,listbox,lower,%
6642       menu,menubutton,message,move,option,add,clear,get,readfile,pack,%
6643       photo,place,radiobutton,raise,scale,scroll,scrollbar,search,see,%
6644       selection,send,stdin,stdout,stderr,tag,bind,text,tk,tkerror,%
6645       tkwait,window,variable,visibility,toplevel,unknown,update,winfo,%
6646       class,exists,ismapped,parent,reqwidth,reqheight,rootx,rooty,%
6647       width,height,wm,aspect,client,command,deiconify,focusmodel,frame,%
6648       geometry,group,iconbitmap,iconify,iconmask,iconname,iconposition,%
6649       iconwindow,maxsize,minsize,overrideredirect,positionfrom,%
6650       protocol,sizefrom,state,title,transient,withdraw,xview,yview,%
6651       yposition,%
6652       -accelerator,-activebackground,-activeborderwidth,%
6653       -activeforeground,-after,-anchor,-arrow,-arrowshape,-aspect,%
6654       -async,-background,-before,-bg,-bigincrement,-bitmap,-bordermode,%
6655       -borderwidth,-button,-capstyle,-channel,-class,-closeenough,%
6656       -colormap,-column,-columnspan,-command,-confine,-container,%
6657       -count,-cursor,-data,-default,-detail,-digits,-direction,%
```

```
6658        -displayof,-disableforeground,-elementborderwidth,-expand,%
6659        -exportselection,-extend,-family,-fg,-file,-fill,-focus,-font,%
6660        -fontmap,-foreground,-format,-from,-gamma,-global,-height,%
6661        -highlightbackground,-highlightcolor,-highlightthickness,-icon,%
6662        -image,-in,-insertbackground,-insertborderwidth,-insertofftime,%
6663        -insertontime,-imsertwidth,-ipadx,-ipady,-joinstyle,-jump,%
6664        -justify,-keycode,-keysym,-label,-lastfor,-length,-maskdata,%
6665        -maskfile,-menu,-message,-mode,-offvalue,-onvalue,-orient,%
6666        -outlien,-outlinestipple,-overstrike,-override,-padx,-pady,%
6667        -pageanchor,-pageheight,-pagewidth,-pagey,-pagey,-palette,%
6668        -parent,-place,-postcommand,-relheight,-relief,-relwidth,-relx,%
6669        -rely,-repeatdelay,-repeatinterval,-resolution,-root,-rootx,%
6670        -rooty,-rotate,-row,-rowspan,-screen,-selectcolor,-selectimage,%
6671        -sendevent,-serial,-setgrid,-showvalue,-shrink,-side,-size,%
6672        -slant,-sliderlength,-sliderrelief,-smooth,-splinesteps,-state,%
6673        -sticky,-stipple,-style,-subsample,-subwindow,-tags,-takefocus,%
6674        -tearoff,-tearoffcommand,-text,-textvariable,-tickinterval,-time,%
6675        -title,-to,-troughcolor,-type,-underline,-use,-value,-variable,%
6676        -visual,-width,-wrap,-wraplength,-x,-xscrollcommand,-y,%
6677        -bgstipple,-fgstipple,-lmargin1,-lmargin2,-rmargin,-spacing1,%
6678        -spacing2,-spacing3,-tabs,-yscrollcommand,-zoom,%
6679        activate,add,addtag,bbox,cget,clone,configure,coords,%
6680        curselection,debug,delete,delta,deselect,dlineinfo,dtag,dump,%
6681        entrycget,entryconfigure,find,flash,fraction,get,gettags,handle,%
6682        icursor,identify,index,insert,invoke,itemcget,itemconfigure,mark,%
6683        moveto,own,post,postcascade,postscript,put,redither,ranges,%
6684        scale,select,show,tag,type,unpost,xscrollcommand,xview,%
6685        yscrollcommand,yview,yposition}%
6686    }%
6687 \lst@definelanguage[]{tcl}%
6688    {alsoletter={.:,*=&-},%
6689    morekeywords={after,append,array,names,exists,anymore,donesearch,%
6690        get,nextelement,set,size,startsearch,auto_mkindex,binary,break,%
6691        case,catch,cd,clock,close,concat,console,continue,default,else,%
6692        elseif,eof,error,eval,exec,-keepnewline,exit,expr,fblocked,%
6693        fconfigure,fcopy,file,atime,dirname,executable,exists,extension,%
6694        isdirectory,isfile,join,lstat,mtime,owned,readable,readlink,%
6695        rootname,size,stat,tail,type,writable,-permissions,-group,-owner,%
6696        -archive,-hidden,-readonly,-system,-creator,-type,-force,%
6697        fileevent,flush,for,foreach,format,gets,glob,global,history,if,%
6698        incr,info,argsbody,cmdcount,commands,complete,default,exists,%
6699        globals,level,library,locals,patchlevel,procs,script,tclversion,%
6700        vars,interp,join,lappend,lindex,linsert,list,llength,lrange,%
6701        lreplace,lsearch,-exact,-regexp,-glob,lsort,-ascii,-integer,%
6702        -real,-dictionary,-increasing,-decreasing,-index,-command,load,%
6703        namespace,open,package,forget,ifneeded,provide,require,unknown,%
6704        vcompare,versions,vsatisfies,pid,proc,puts,-nonewline,pwd,read,%
6705        regexp,-indices,regsub,-all,-nocaserename,return,scan,seek,set,%
6706        socket,source,split,string,compare,first,index,last,length,match,%
```

```
6707        range,tolower,toupper,trim,trimleft,trimright,subst,switch,tell,%
6708        time,trace,variable,vdelete,vinfo,unknown,unset,uplevel,upvar,%
6709        vwait,while,acos,asin,atan,atan2,ceil,cos,cosh,exp,floor,fmod,%
6710        hypot,log,log10,pow,sin,sinh,sqrt,tan,tanh,abs,double,int,round%
6711        },%
6712    morestring=[d]",%
6713    morecomment=[f]\#,%
6714    morecomment=[l]{;\#},%
6715    morecomment=[l]{[\#},%
6716    morecomment=[l]{\{\#}%
6717    }[keywords,comments,strings]
```

And after receiving a bug report from Vitaly A. Repin I converted the version 0.21
contents of `MoreSelectCharTable` to version 1.0.

```
6718 ⟨/lang2⟩
```

2.78   Statistical languages

These languages have been added by Winfried Theis. Robert Denham contributed
the additional string delimiter ’.

```
6719 ⟨∗lang3⟩
```

```
6720 \lst@definelanguage{S}[]{R}{}
6721 \lst@definelanguage[PLUS]{S}[]{R}{}
6722 \lst@definelanguage{R}%
6723    {keywords={abbreviate,abline,abs,acos,acosh,action,add1,add,%
6724        aggregate,alias,Alias,alist,all,anova,any,aov,aperm,append,apply,%
6725        approx,approxfun,apropos,Arg,args,array,arrows,as,asin,asinh,%
6726        atan,atan2,atanh,attach,attr,attributes,autoload,autoloader,ave,%
6727        axis,backsolve,barplot,basename,besselI,besselJ,besselK,besselY,%
6728        beta,binomial,body,box,boxplot,break,browser,bug,builtins,bxp,by,%
6729        c,C,call,Call,case,cat,category,cbind,ceiling,character,char,%
6730        charmatch,check,chol,chol2inv,choose,chull,class,close,cm,codes,%
6731        coef,coefficients,co,col,colnames,colors,colours,commandArgs,%
6732        comment,complete,complex,conflicts,Conj,contents,contour,%
6733        contrasts,contr,control,helmert,contrib,convolve,cooks,coords,%
6734        distance,coplot,cor,cos,cosh,count,fields,cov,covratio,wt,CRAN,%
6735        create,crossprod,cummax,cummin,cumprod,cumsum,curve,cut,cycle,D,%
6736        data,dataentry,date,dbeta,dbinom,dcauchy,dchisq,de,debug,%
6737        debugger,Defunct,default,delay,delete,deltat,demo,de,density,%
6738        deparse,dependencies,Deprecated,deriv,description,detach,%
6739        dev2bitmap,dev,cur,deviance,off,prev,,dexp,df,dfbetas,dffits,%
6740        dgamma,dgeom,dget,dhyper,diag,diff,digamma,dim,dimnames,dir,%
6741        dirname,dlnorm,dlogis,dnbinom,dnchisq,dnorm,do,dotplot,double,%
6742        download,dpois,dput,drop,drop1,dsignrank,dt,dummy,dump,dunif,%
6743        duplicated,dweibull,dwilcox,dyn,edit,eff,effects,eigen,else,%
6744        emacs,end,environment,env,erase,eval,equal,evalq,example,exists,%
6745        exit,exp,expand,expression,External,extract,extractAIC,factor,%
6746        fail,family,fft,file,filled,find,fitted,fivenum,fix,floor,for,%
6747        For,formals,format,formatC,formula,Fortran,forwardsolve,frame,%
```

```
6748        frequency,ftable,ftable2table,function,gamma,Gamma,gammaCody,%
6749        gaussian,gc,gcinfo,gctorture,get,getenv,geterrmessage,getOption,%
6750        getwd,gl,glm,globalenv,gnome,GNOME,graphics,gray,grep,grey,grid,%
6751        gsub,hasTsp,hat,heat,help,hist,home,hsv,httpclient,I,identify,if,%
6752        ifelse,Im,image,\%in\%,index,influence,measures,inherits,install,%
6753        installed,integer,interaction,interactive,Internal,intersect,%
6754        inverse,invisible,IQR,is,jitter,kappa,kronecker,labels,lapply,%
6755        layout,lbeta,lchoose,lcm,legend,length,levels,lgamma,library,%
6756        licence,license,lines,list,lm,load,local,locator,log,log10,log1p,%
6757        log2,logical,loglin,lower,lowess,ls,lsfit,lsf,ls,machine,Machine,%
6758        mad,mahalanobis,make,link,margin,match,Math,matlines,mat,matplot,%
6759        matpoints,matrix,max,mean,median,memory,menu,merge,methods,min,%
6760        missing,Mod,mode,model,response,mosaicplot,mtext,mvfft,na,nan,%
6761        names,omit,nargs,nchar,ncol,NCOL,new,next,NextMethod,nextn,%
6762        nlevels,nlm,noquote,NotYetImplemented,NotYetUsed,nrow,NROW,null,%
6763        numeric,\%o\%,objects,offset,old,on,Ops,optim,optimise,optimize,%
6764        options,or,order,ordered,outer,package,packages,page,pairlist,%
6765        pairs,palette,panel,par,parent,parse,paste,path,pbeta,pbinom,%
6766        pcauchy,pchisq,pentagamma,persp,pexp,pf,pgamma,pgeom,phyper,pico,%
6767        pictex,piechart,Platform,plnorm,plogis,plot,pmatch,pmax,pmin,%
6768        pnbinom,pnchisq,pnorm,points,poisson,poly,polygon,polyroot,pos,%
6769        postscript,power,ppoints,ppois,predict,preplot,pretty,Primitive,%
6770        print,prmatrix,proc,prod,profile,proj,prompt,prop,provide,%
6771        psignrank,ps,pt,ptukey,punif,pweibull,pwilcox,q,qbeta,qbinom,%
6772        qcauchy,qchisq,qexp,qf,qgamma,qgeom,qhyper,qlnorm,qlogis,qnbinom,%
6773        qnchisq,qnorm,qpois,qqline,qqnorm,qqplot,qr,Q,qty,qy,qsignrank,%
6774        qt,qtukey,quantile,quasi,quit,qunif,quote,qweibull,qwilcox,%
6775        rainbow,range,rank,rbeta,rbind,rbinom,rcauchy,rchisq,Re,read,csv,%
6776        csv2,fwf,readline,socket,real,Recall,rect,reformulate,regexpr,%
6777        relevel,remove,rep,repeat,replace,replications,report,require,%
6778        resid,residuals,restart,return,rev,rexp,rf,rgamma,rgb,rgeom,R,%
6779        rhyper,rle,rlnorm,rlogis,rm,rnbinom,RNGkind,rnorm,round,row,%
6780        rownames,rowsum,rpois,rsignrank,rstandard,rstudent,rt,rug,runif,%
6781        rweibull,rwilcox,sample,sapply,save,scale,scan,scan,screen,sd,se,%
6782        search,searchpaths,segments,seq,sequence,setdiff,setequal,set,%
6783        setwd,show,sign,signif,sin,single,sinh,sink,solve,sort,source,%
6784        spline,splinefun,split,sqrt,stars,start,stat,stem,step,stop,%
6785        storage,strstrheight,stripplot,strsplit,structure,strwidth,sub,%
6786        subset,substitute,substr,substring,sum,summary,sunflowerplot,svd,%
6787        sweep,switch,symbol,symbols,symnum,sys,status,system,t,table,%
6788        tabulate,tan,tanh,tapply,tempfile,terms,terrain,tetragamma,text,%
6789        time,title,topo,trace,traceback,transform,tri,trigamma,trunc,try,%
6790        ts,tsp,typeof,unclass,undebug,undoc,union,unique,uniroot,unix,%
6791        unlink,unlist,unname,untrace,update,upper,url,UseMethod,var,%
6792        variable,vector,Version,vi,warning,warnings,weighted,weights,%
6793        which,while,window,write,\%x\%,x11,X11,xedit,xemacs,xinch,xor,%
6794        xpdrows,xy,xyinch,yinch,zapsmall,zip},%
6795    otherkeywords={!,!=,~,$,*,\&,\%/\%,\%*\%,\%\%,<-,<<-,_,/},%
6796    alsoother={._$},%
6797    sensitive,%
```

```
6798    morecomment=[l]\#,%
6799    morestring=[d]",%
6800    morestring=[d]'% 2001 Robert Denham
6801    }%
```

Benjamin Janson got a `prockeywords undefined` error, which was removed by Heiko Oberdiek.

```
6802 \lst@definelanguage{SAS}{%
6803    procnamekeys={proc},%
6804    morekeywords={DATA, AND, OR, NOT, EQ, GT, LT, GE, LE, NE, INFILE, INPUT,%
6805        DO, BY, TO, SIN, COS, OUTPUT, END, PLOT, RUN, LIBNAME, VAR, TITLE,%
6806        FIRSTOBS, OBS, DELIMITER, DLM, EOF, ABS, DIM, HBOUND, LBOUND, MAX, MIN,%
6807        MOD, SIGN, SQRT, CEIL, FLOOR, FUZZ, INT, ROUND, TRUNC, DIGAMMA, ERF,%
6808        ERFC, EXP, GAMMA, LGAMMA, LOG, LOG2, LOG10, ARCOS, ARSIN, ATAN, COSH,%
6809        SINH, TANH, TAN, POISSON, PROBBETA, PROBBNML, PROBCHI, PROBF, PROBGAM,%
6810        PROBHYPR, PROBNEGB, PROBNORM, PROBT, BETAINV, CINV, FINV, GAMINV,%
6811        PROBIT, TINV, CSS, CV, KURTOSIS, MEAN, NMISS, RANGE, SKEWNESS, STD,%
6812        STDERR, SUM, USS, NORMAL, RANBIN, RANCAU, RANEXP, RANGAM, RANNOR,%
6813        RANPOI, RANTBL, RANTRI, RANUNI, UNIFORM, IF, THEN, ELSE, WHILE, UNTIL,%
6814        DROP, KEEP, LABEL, DEFAULT, ARRAY, MERGE, CARDS, CARDS4, PUT, SET,%
6815        UPDATE, ABORT, DELETE, DISPLAY, LIST, LOSTCARD, MISSING, STOP, WHERE,%
6816        ARRAY, DROP, KEEP, WINDOW, LENGTH, RENAME, RETAIN, MEANS, UNIVARIATE,%
6817        SUMMARY, TABULATE, CORR, FREQ, FOOTNOTE, NOTE, SHOW},%
6818    otherkeywords={!,!=,~,$,*,\&,_,/,<,>=,=<,>},%
6819    morestring=[d]'%
6820 }[keywords,comments,strings,procnames]%

6821 ⟨/lang3⟩
```

2.79 TeX

I extracted the data from `plain.tex`, `latex.ltx`, and `size10.clo`. Dr. Peter Leibner reported that some keywords are missing and also added a couple.

```
6822 ⟨*lang3⟩

6823 \lst@definelanguage[AlLaTeX]{TeX}[LaTeX]{TeX}%
6824    {moretexcs={AtBeginDocument,AtBeginDvi,AtEndDocument,AtEndOfClass,%
6825        AtEndOfPackage,ClassError,ClassInfo,ClassWarning,%
6826        ClassWarningNoLine,CurrentOption,DeclareErrorFont,%
6827        DeclareFixedFont,DeclareFontEncoding,DeclareFontEncodingDefaults,%
6828        DeclareFontFamily,DeclareFontShape,DeclareFontSubstitution,%
6829        DeclareMathAccent,DeclareMathAlphabet,DeclareMathAlphabet,%
6830        DeclareMathDelimiter,DeclareMathRadical,DeclareMathSizes,%
6831        DeclareMathSymbol,DeclareMathVersion,DeclareOldFontCommand,%
6832        DeclareOption,DeclarePreloadSizes,DeclareRobustCommand,%
6833        DeclareSizeFunction,DeclareSymbolFont,DeclareSymbolFontAlphabet,%
6834        DeclareTextAccent,DeclareTextAccentDefault,DeclareTextCommand,%
6835        DeclareTextCommandDefault,DeclareTextComposite,%
6836        DeclareTextCompositeCommand,DeclareTextFontCommand,%
6837        DeclareTextSymbol,DeclareTextSymbolDefault,ExecuteOptions,%
```

```
6838        GenericError,GenericInfo,GenericWarning,IfFileExists,%
6839        InputIfFileExists,LoadClass,LoadClassWithOptions,MessageBreak,%
6840        OptionNotUsed,PackageError,PackageInfo,PackageWarning,%
6841        PackageWarningNoLine,PassOptionsToClass,PassOptionsToPackage,%
6842        ProcessOptionsProvidesClass,ProvidesFile,ProvidesFile,%
6843        ProvidesPackage,ProvideTextCommand,RequirePackage,%
6844        RequirePackageWithOptions,SetMathAlphabet,SetSymbolFont,%
6845        TextSymbolUnavailable,UseTextAccent,UseTextSymbol},%
6846      morekeywords={array,center,displaymath,document,enumerate,eqnarray,%
6847        equation,flushleft,flushright,itemize,list,lrbox,math,minipage,%
6848        picture,sloppypar,tabbing,tabular,trivlist,verbatim}%
6849    }%
6850  \lst@definelanguage[LaTeX]{TeX}[common]{TeX}%
6851    {moretexcs={a,AA,aa,addcontentsline,addpenalty,addtocontents,%
6852        addtocounter,addtolength,addtoversion,addvspace,alph,Alph,and,%
6853        arabic,array,arraycolsep,arrayrulewidth,arraystretch,author,%
6854        baselinestretch,begin,bezier,bfseries,bibcite,bibdata,bibitem,%
6855        bibliography,bibliographystyle,bibstyle,bigskip,boldmath,%
6856        botfigrule,bottomfraction,Box,caption,center,CheckCommand,circle,%
6857        citation,cite,cleardoublepage,clearpage,cline,columnsep,%
6858        columnseprule,columnwidth,contentsline,dashbox,date,dblfigrule,%
6859        dblfloatpagefraction,dblfloatsep,dbltextfloatsep,dbltopfraction,%
6860        defaultscriptratio,defaultscriptscriptratio,depth,Diamond,%
6861        displaymath,document,documentclass,documentstyle,doublerulesep,%
6862        em,emph,endarray,endcenter,enddisplaymath,enddocument,%
6863        endenumerate,endeqnarray,endequation,endflushleft,endflushright,%
6864        enditemize,endlist,endlrbox,endmath,endminipage,endpicture,%
6865        endsloppypar,endtabbing,endtabular,endtrivlist,endverbatim,%
6866        enlargethispage,ensuremath,enumerate,eqnarray,equation,%
6867        evensidemargin,extracolsep,fbox,fboxrule,fboxsep,filecontents,%
6868        fill,floatpagefraction,floatsep,flushbottom,flushleft,flushright,%
6869        fnsymbol,fontencoding,fontfamily,fontseries,fontshape,fontsize,%
6870        fontsubfuzz,footnotemark,footnotesep,footnotetext,footskip,frac,%
6871        frame,framebox,fussy,glossary,headheight,headsep,height,hline,%
6872        hspace,I,include,includeonly,index,inputlineno,intextsep,%
6873        itemindent,itemize,itemsep,iterate,itshape,Join,kill,label,%
6874        labelsep,labelwidth,LaTeX,LaTeXe,leadsto,lefteqn,leftmargin,%
6875        leftmargini,leftmarginii,leftmarginiii,leftmarginiv,leftmarginv,%
6876        leftmarginvi,leftmark,lhd,lim,linebreak,linespread,linethickness,%
6877        linewidth,list,listfiles,listfiles,listparindent,lrbox,%
6878        makeatletter,makeatother,makebox,makeglossary,makeindex,%
6879        makelabel,MakeLowercase,MakeUppercase,marginpar,marginparpush,%
6880        marginparsep,marginparwidth,markboth,markright,math,mathbf,%
6881        mathellipsis,mathgroup,mathit,mathrm,mathsf,mathsterling,mathtt,%
6882        mathunderscore,mathversion,mbox,mdseries,mho,minipage,%
6883        multicolumn,multiput,NeedsTeXFormat,newcommand,newcounter,%
6884        newenvironment,newfont,newhelp,newlabel,newlength,newline,%
6885        newmathalphabet,newpage,newsavebox,newtheorem,nobreakspace,%
6886        nobreakspace,nocite,nocorr,nocorrlist,nofiles,nolinebreak,%
```

```
6887        nonumber,nopagebreak,normalcolor,normalfont,normalmarginpar,%
6888        numberline,obeycr,oddsidemargin,oldstylenums,onecolumn,oval,%
6889        pagebreak,pagenumbering,pageref,pagestyle,paperheight,paperwidth,%
6890        paragraphmark,parbox,parsep,partopsep,picture,poptabs,pounds,%
6891        protect,pushtabs,put,qbezier,qbeziermax,r,raggedleft,raisebox,%
6892        ref,refstepcounter,renewcommand,renewenvironment,restorecr,%
6893        reversemarginpar,rhd,rightmargin,rightmark,rmfamily,roman,Roman,%
6894        rootbox,rule,samepage,sbox,scshape,secdef,section,sectionmark,%
6895        selectfont,setcounter,settodepth,settoheight,settowidth,sffamily,%
6896        shortstack,showoutput,showoverfull,sloppy,sloppypar,slshape,%
6897        smallskip,sqsubset,sqsupset,SS,stackrel,stepcounter,stop,stretch,%
6898        subparagraphmark,subsectionmark,subsubsectionmark,sum,%
6899        suppressfloats,symbol,tabbing,tabbingsep,tabcolsep,tabular,%
6900        tabularnewline,textasciicircum,textasciitilde,textbackslash,%
6901        textbar,textbf,textbraceleft,textbraceright,textbullet,%
6902        textcircled,textcompwordmark,textdagger,textdaggerdbl,textdollar,%
6903        textellipsis,textemdash,textendash,textexclamdown,textfloatsep,%
6904        textfraction,textgreater,textheight,textit,textless,textmd,%
6905        textnormal,textparagraph,textperiodcentered,textquestiondown,%
6906        textquotedblleft,textquotedblright,textquoteleft,textquoteright,%
6907        textregistered,textrm,textsc,textsection,textsf,textsl,%
6908        textsterling,textsuperscript,texttrademark,texttt,textunderscore,%
6909        textup,textvisiblespace,textwidth,thanks,thefootnote,thempfn,%
6910        thempfn,thempfootnote,thepage,thepage,thicklines,thinlines,%
6911        thispagestyle,title,today,topfigrule,topfraction,topmargin,%
6912        topsep,totalheight,tracingfonts,trivlist,ttfamily,twocolumn,%
6913        typein,typeout,unboldmath,unitlength,unlhd,unrhd,upshape,usebox,%
6914        usecounter,usefont,usepackage,value,vector,verb,verbatim,vline,%
6915        vspace,width,%
6916        normalsize,small,footnotesize,scriptsize,tiny,large,Large,LARGE,%
6917        huge,Huge}%
6918    }%
6919 \lst@definelanguage[plain]{TeX}[common]{TeX}%
6920    {moretexcs={advancepageno,beginsection,bf,bffam,bye,cal,cleartabs,%
6921        columns,dosupereject,endinsert,eqalign,eqalignno,fiverm,fivebf,%
6922        fivei,fivesy,folio,footline,hang,headline,it,itemitem,itfam,%
6923        leqalignno,magnification,makefootline,makeheadline,midinsert,mit,%
6924        mscount,nopagenumbers,normalbottom,of,oldstyle,pagebody,%
6925        pagecontents,pageinsert,pageno,plainoutput,preloaded,proclaim,rm,%
6926        settabs,sevenbf,seveni,sevensy,sevenrm,sl,slfam,supereject,%
6927        tabalign,tabs,tabsdone,tabsyet,tenbf,tenex,teni,tenit,tenrm,%
6928        tensl,tensy,tentt,textindent,topglue,topins,topinsert,tt,ttfam,%
6929        ttraggedright,vfootnote}%
6930    }%
```

The following language is only a helper.

```
6931 \lst@definelanguage[common]{TeX}[primitive]{TeX}
6932    {moretexcs={active,acute,ae,AE,aleph,allocationnumber,allowbreak,%
6933        alpha,amalg,angle,approx,arccos,arcsin,arctan,arg,arrowvert,%
6934        Arrowvert,ast,asymp,b,backslash,bar,beta,bgroup,big,Big,bigbreak,%
```

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```
6935        bigcap,bigcirc,bigcup,bigg,Bigg,biggl,Biggl,biggm,Biggm,biggr,%
6936        Biggr,bigl,Bigl,bigm,Bigm,bigodot,bigoplus,bigotimes,bigr,Bigr,%
6937        bigskip,bigskipamount,bigsqcup,bigtriangledown,bigtriangleup,%
6938        biguplus,bigvee,bigwedge,bmod,bordermatrix,bot,bowtie,brace,%
6939        braceld,bracelu,bracerd,braceru,bracevert,brack,break,breve,%
6940        buildrel,bullet,c,cap,cases,cdot,cdotp,cdots,centering,%
6941        centerline,check,chi,choose,circ,clubsuit,colon,cong,coprod,%
6942        copyright,cos,cosh,cot,coth,csc,cup,d,dag,dagger,dashv,ddag,%
6943        ddagger,ddot,ddots,deg,delta,Delta,det,diamond,diamondsuit,dim,%
6944        displaylines,div,do,dospecials,dot,doteq,dotfill,dots,downarrow,%
6945        Downarrow,downbracefill,egroup,eject,ell,empty,emptyset,endgraf,%
6946        endline,enskip,enspace,epsilon,equiv,eta,exists,exp,filbreak,%
6947        flat,fmtname,fmtversion,footins,footnote,footnoterule,forall,%
6948        frenchspacing,frown,gamma,Gamma,gcd,ge,geq,gets,gg,goodbreak,%
6949        grave,H,hat,hbar,heartsuit,hglue,hideskip,hidewidth,hom,%
6950        hookleftarrow,hookrightarrow,hphantom,hrulefill,i,ialign,iff,Im,%
6951        imath,in,inf,infty,int,interdisplaylinepenalty,%
6952        interfootnotelinepenalty,intop,iota,item,j,jmath,joinrel,jot,%
6953        kappa,ker,l,L,lambda,Lambda,land,langle,lbrace,lbrack,lceil,%
6954        ldotp,ldots,le,leavevmode,leftarrow,Leftarrow,leftarrowfill,%
6955        leftharpoondown,leftharpoonup,leftline,leftrightarrow,%
6956        Leftrightarrow,leq,lfloor,lg,lgroup,lhook,lim,liminf,limsup,line,%
6957        ll,llap,lmoustache,ln,lnot,log,longleftarrow,Longleftarrow,%
6958        longleftrightarrow,Longleftrightarrow,longmapsto,longrightarrow,%
6959        Longrightarrow,loop,lor,lq,magstep,magstep,magstephalf,mapsto,%
6960        mapstochar,mathhexbox,mathpalette,mathstrut,matrix,max,maxdimen,%
6961        medbreak,medskip,medskipamount,mid,min,models,mp,mu,multispan,%
6962        nabla,narrower,natural,ne,nearrow,neg,negthinspace,neq,newbox,%
6963        newcount,newdimen,newfam,newif,newinsert,newlanguage,newmuskip,%
6964        newread,newskip,newtoks,newwrite,next,ni,nobreak,nointerlineskip,%
6965        nonfrenchspacing,normalbaselines,normalbaselineskip,%
6966        normallineskip,normallineskiplimit,not,notin,nu,null,nwarrow,o,O,%
6967        oalign,obeylines,obeyspaces,odot,oe,OE,offinterlineskip,oint,%
6968        ointop,omega,Omega,ominus,ooalign,openup,oplus,oslash,otimes,%
6969        overbrace,overleftarrow,overrightarrow,owns,P,parallel,partial,%
6970        perp,phantom,phi,Phi,pi,Pi,pm,pmatrix,pmod,Pr,prec,preceq,prime,%
6971        prod,propto,psi,Psi,qquad,quad,raggedbottom,raggedright,rangle,%
6972        rbrace,rbrack,rceil,Re,relbar,Relbar,removelastskip,repeat,%
6973        rfloor,rgroup,rho,rhook,rightarrow,Rightarrow,rightarrowfill,%
6974        rightharpoondown,rightharpoonup,rightleftharpoons,rightline,rlap,%
6975        rmoustache,root,rq,S,sb,searrow,sec,setminus,sharp,showhyphens,%
6976        sigma,Sigma,sim,simeq,sin,sinh,skew,slash,smallbreak,smallint,%
6977        smallskip,smallskipamount,smash,smile,sp,space,spadesuit,sqcap,%
6978        sqcup,sqrt,sqsubseteq,sqsupseteq,ss,star,strut,strutbox,subset,%
6979        subseteq,succ,succeq,sum,sup,supset,supseteq,surd,swarrow,t,tan,%
6980        tanh,tau,TeX,theta,Theta,thinspace,tilde,times,to,top,tracingall,%
6981        triangle,triangleleft,triangleright,u,underbar,underbrace,%
6982        uparrow,Uparrow,upbracefill,updownarrow,Updownarrow,uplus,%
6983        upsilon,Upsilon,v,varepsilon,varphi,varpi,varrho,varsigma,%
6984        vartheta,vdash,vdots,vec,vee,vert,Vert,vglue,vphantom,wedge,%
```

```
6985        widehat,widetilde,wlog,wp,wr,xi,Xi,zeta}%
6986    }%
```

Herbert Voss pointed to a typo: the TEX primitive is `lineskiplimit` instead of `lineskiplimits`.

```
6987 \lst@definelanguage[primitive]{TeX}%
6988    {moretexcs={above,abovedisplayshortskip,abovedisplayskip,aftergroup,%
6989        abovewithdelims,accent,adjdemerits,advance,afterassignment,atop,%
6990        atopwithdelims,badness,baselineskip,batchmode,begingroup,%
6991        belowdisplayshortskip,belowdisplayskip,binoppenalty,botmark,box,%
6992        boxmaxdepth,brokenpenalty,catcode,char,chardef,cleaders,closein,%
6993        closeout,clubpenalty,copy,count,countdef,cr,crcr,csname,day,%
6994        deadcycles,def,defaulthyphenchar,defaultskewchar,delcode,%
6995        delimiter,delimiterfactor,delimitershortfall,dimen,dimendef,%
6996        discretionary,displayindent,displaylimits,displaystyle,%
6997        displaywidowpenalty,displaywidth,divide,doublehyphendemerits,dp,%
6998        edef,else,emergencystretch,end,endcsname,endgroup,endinput,%
6999        endlinechar,eqno,errhelp,errmessage,errorcontextlines,%
7000        errorstopmode,escapechar,everycr,everydisplay,everyhbox,everyjob,%
7001        everymath,everypar,everyvbox,exhyphenpenalty,expandafter,fam,fi,%
7002        finalhyphendemerits,firstmark,floatingpenalty,font,fontdimen,%
7003        fontname,futurelet,gdef,global,globaldefs,halign,hangafter,%
7004        hangindent,hbadness,hbox,hfil,hfill,hfilneg,hfuzz,hoffset,%
7005        holdinginserts,hrule,hsize,hskip,hss,ht,hyphenation,hyphenchar,%
7006        hyphenpenalty,if,ifcase,ifcat,ifdim,ifeof,iffalse,ifhbox,ifhmode,%
7007        ifinner,ifmmode,ifnum,ifodd,iftrue,ifvbox,ifvmode,ifvoid,ifx,%
7008        ignorespaces,immediate,indent,input,insert,insertpenalties,%
7009        interlinepenalty,jobname,kern,language,lastbox,lastkern,%
7010        lastpenalty,lastskip,lccode,leaders,left,lefthyphenmin,leftskip,%
7011        leqno,let,limits,linepenalty,lineskip,lineskiplimit,long,%
7012        looseness,lower,lowercase,mag,mark,mathaccent,mathbin,mathchar,%
7013        mathchardef,mathchoice,mathclose,mathcode,mathinner,mathop,%
7014        mathopen,mathord,mathpunct,mathrel,mathsurround,maxdeadcycles,%
7015        maxdepth,meaning,medmuskip,message,mkern,month,moveleft,%
7016        moveright,mskip,multiply,muskip,muskipdef,newlinechar,noalign,%
7017        noboundary,noexpand,noindent,nolimits,nonscript,nonstopmode,%
7018        nulldelimiterspace,nullfont,number,omit,openin,openout,or,outer,%
7019        output,outputpenalty,over,overfullrule,overline,overwithdelims,%
7020        pagedepth,pagefilllstretch,pagefillstretch,pagefilstretch,%
7021        pagegoal,pageshrink,pagestretch,pagetotal,par,parfillskip,%
7022        parindent,parshape,parskip,patterns,pausing,penalty,%
7023        postdisplaypenalty,predisplaypenalty,predisplaysize,pretolerance,%
7024        prevdepth,prevgraf,radical,raise,read,relax,relpenalty,right,%
7025        righthyphenmin,rightskip,romannumeral,scriptfont,%
7026        scriptscriptfont,scriptscriptstyle,scriptspace,scriptstyle,%
7027        scrollmode,setbox,setlanguage,sfcode,shipout,show,showbox,%
7028        showboxbreadth,showboxdepth,showlists,showthe,skewchar,skip,%
7029        skipdef,spacefactor,spaceskip,span,special,splitbotmark,%
7030        splitfirstmark,splitmaxdepth,splittopskip,string,tabskip,%
7031        textfont,textstyle,the,thickmuskip,thinmuskip,time,toks,toksdef,%
```

```
7032        tolerance,topmark,topskip,tracingcommands,tracinglostchars,%
7033        tracingmacros,tracingonline,tracingoutput,tracingpages,%
7034        tracingparagraphs,tracingrestores,tracingstats,uccode,uchyph,%
7035        underline,unhbox,unhcopy,unkern,unpenalty,unskip,unvbox,unvcopy,%
7036        uppercase,vadjust,valign,vbadness,vbox,vcenter,vfil,vfill,%
7037        vfilneg,vfuzz,voffset,vrule,vsize,vskip,vsplit,vss,vtop,wd,%
7038        widowpenalty,write,xdef,xleaders,xspaceskip,year},%
7039      sensitive,%
7040      alsoother={0123456789$_},%$ to make Emacs fontlocking happy
7041      morecomment=[l]\%%
7042      }[keywords,tex,comments]%

7043 ⟨/lang3⟩
```

2.80   VBScript

Sonja WeidmannVBScript sent me this language definition.

```
7044 ⟨∗lang2⟩

7045 %%
7046 %% VBScript definition (c) 2000 Sonja Weidmann
7047 %%
7048 \lst@definelanguage{VBScript}%
7049   {morekeywords={Call,Case,Const,Dim,Do,Each,Else,End,Erase,Error,Exit,%
7050        Explicit,For,Function,If,Loop,Next,On,Option,Private,Public,%
7051        Randomize,ReDim,Rem,Select,Set,Sub,Then,Wend,While,Abs,Array,Asc,%
7052        Atn,CBool,CByte,CCur,CDate,CDbl,Chr,CInt,CLng,Cos,CreateObject,%
7053        CSng,CStr,Date,DateAdd,DateDiff,DatePart,DateSerial,DateValue,%
7054        Day,Exp,Filter,Fix,FormatCurrency,FormatDateTime,FormatNumber,%
7055        FormatPercent,GetObject,Hex,Hour,InputBox,InStr,InStrRev,Int,%
7056        IsArray,IsDate,IsEmpty,IsNull,IsNumeric,IsObject,Join,LBound,%
7057        LCase,Left,Len,LoadPicture,Log,LTrim,Mid,Minute,Month,MonthName,%
7058        MsgBox,Now,Oct,Replace,RGB,Right,Rnd,Round,RTrim,ScriptEngine,%
7059        ScriptEngineBuildVersion,ScriptEngineMajorVersion,%
7060        ScriptEngineMinorVersion,Second,Sgn,Sin,Space,Split,Sqr,StrComp,%
7061        StrReverse,String,Tan,Time,TimeSerial,TimeValue,Trim,TypeName,%
7062        UBound,UCase,VarType,Weekday,WeekdayName,Year, And,Eqv,Imp,Is,%
7063        Mod,Not,Or,Xor,Add,BuildPath,Clear,Close,Copy,CopyFile,%
7064        CopyFolder,CreateFolder,CreateTextFile,Delete,DeleteFile,%
7065        DeleteFolder,Dictionary,Drive,DriveExists,Drives,Err,Exists,File,%
7066        FileExists,FileSystemObject,Files,Folder,FolderExists,Folders,%
7067        GetAbsolutePathName,GetBaseName,GetDrive,GetDriveName,%
7068        GetExtensionName,GetFile,GetFileName,GetFolder,%
7069        GetParentFolderName,GetSpecialFolder,GetTempName,Items,Keys,Move,%
7070        MoveFile,MoveFolder,OpenAsTextStream,OpenTextFile,Raise,Read,%
7071        ReadAll,ReadLine,Remove,RemoveAll,Skip,SkipLine,TextStream,Write,%
7072        WriteBlankLines,WriteLine,Alias,Archive,CDROM,Compressed,%
7073        Directory,Fixed,ForAppending,ForReading,ForWriting,Hidden,Normal,%
7074        RAMDisk,ReadOnly,Remote,Removable,System,SystemFolder,%
7075        TemporaryFolder,TristateFalse,TristateTrue,TristateUseDefault,%
```

```
7076        Unknown,Volume,WindowsFolder,vbAbortRetryIgnore,%
7077        vbApplicationModal,vbArray,vbBinaryCompare,vbBlack,vbBlue,%
7078        vbBoolean,vbByte,vbCr,vbCrLf,vbCritical,vbCurrency,vbCyan,%
7079        vbDataObject,vbDate,vbDecimal,vbDefaultButton1,vbDefaultButton2,%
7080        vbDefaultButton3,vbDefaultButton4,vbDouble,vbEmpty,vbError,%
7081        vbExclamation,vbFirstFourDays,vbFirstFullWeek,vbFirstJan1,%
7082        vbFormFeed,vbFriday,vbGeneralDate,vbGreen,vbInformation,%
7083        vbInteger,vbLf,vbLong,vbLongDate,vbLongTime,vbMagenta,vbMonday,%
7084        vbNewLine,vbNull,vbNullChar,vbNullString,vbOKC,ancel,vbOKOnly,%
7085        vbObject,vbObjectError,vbQuestion,vbRed,vbRetryCancel,vbSaturday,%
7086        vbShortDate,vbShortTime,vbSingle,vbString,vbSunday,vbSystemModal,%
7087        vbTab,vbTextCompare,vbThursday,vbTuesday,vbUseSystem,%
7088        vbUseSystemDayOfWeek,vbVariant,vbVerticalTab,vbWednesday,vbWhite,%
7089        vbYellow,vbYesNo,vbYesNoCancel},%
7090    sensitive=f,%
7091    morecomment=[l]',%
7092    morestring=[d]"%
7093    }[keywords,comments,strings]

7094 ⟨/lang2⟩
```

2.81   Verilog

Thanks to Cameron H. G. Wright for providing the definition. After a bug report by George M. Georgiou I changed the declaration of directives to use normal keywords.

```
7095 ⟨*lang3⟩

7096 %%
7097 %% Verilog definition (c) 2003 Cameron H. G. Wright <c.h.g.wright@ieee.org>
7098 %% Based on the IEEE 1364-2001 Verilog HDL standard
7099 %% Ref: S. Palnitkar, "Verilog HDL: A Guide to Digital Design and Synthesis,"
7100 %%      Prentice Hall, 2003. ISBN: 0-13-044911-3
7101 %%
7102 \lst@definelanguage{Verilog}%
7103    {morekeywords={% reserved keywords
7104        always,and,assign,automatic,begin,buf,bufif0,bufif1,case,casex,%
7105        casez,cell,cmos,config,deassign,default,defparam,design,disable,%
7106        edge,else,end,endcase,endconfig,endfunction,endgenerate,%
7107        endmodule,endprimitive,endspecify,endtable,endtask,event,for,%
7108        force,forever,fork,function,generate,genvar,highz0,highz1,if,%
7109        ifnone,incdir,include,initial,inout,input,instance,integer,join,%
7110        large,liblist,library,localparam,macromodule,medium,module,nand,%
7111        negedge,nmos,nor,noshowcancelled,not,notif0,notif1,or,output,%
7112        parameter,pmos,posedge,primitive,pull0,pull1,pulldown,pullup,%
7113        pulsestyle_onevent,pulsestyle_ondetect,rcmos,real,realtime,reg,%
7114        release,repeat,rnmos,rpmos,rtran,rtranif0,rtranif1,scalared,%
7115        showcancelled,signed,small,specify,specparam,strong0,strong1,%
7116        supply0,supply1,table,task,time,tran,tranif0,tranif1,tri,tri0,%
7117        tri1,triand,trior,trireg,unsigned,use,vectored,wait,wand,weak0,%
```

```
7118        weak1,while,wire,wor,xnor,xor},%
7119    morekeywords=[2]{% system tasks and functions
7120        $bitstoreal,$countdrivers,$display,$fclose,$fdisplay,$fmonitor,%
7121        $fopen,$fstrobe,$fwrite,$finish,$getpattern,$history,$incsave,%
7122        $input,$itor,$key,$list,$log,$monitor,$monitoroff,$monitoron,%
7123        $nokey},%
7124    morekeywords=[3]{% compiler directives
7125        `accelerate,`autoexpand_vectornets,`celldefine,`default_nettype,%
7126        `define,`else,`elsif,`endcelldefine,`endif,`endprotect,%
7127        `endprotected,`expand_vectornets,`ifdef,`ifndef,`include,%
7128        `no_accelerate,`noexpand_vectornets,`noremove_gatenames,%
7129        `nounconnected_drive,`protect,`protected,`remove_gatenames,%
7130        `remove_netnames,`resetall,`timescale,`unconnected_drive},%
7131    alsoletter=\`,%
7132    sensitive,%
7133    morecomment=[s]{/*}{*/},%
7134    morecomment=[l]//,% nonstandard
7135    morestring=[b]"%
7136    }[keywords,comments,strings]
```

7137 ⟨/lang3⟩

2.82   VHDL

This language is due to Kai WollenweberVHDL. I've done conversion to version
0.19 only. Gaurav Aggarwal reported that VHDL is case insensitive and Ar-
naud Tisseranddded three keywords.

7138 ⟨∗lang1⟩

```
7139 %%
7140 %% VHDL definition (c) 1997 Kai Wollenweber
7141 %%
7142 \lst@definelanguage{VHDL}%
7143   {morekeywords={ALL,ARCHITECTURE,ABS,AND,ASSERT,ARRAY,AFTER,ALIAS,%
7144        ACCESS,ATTRIBUTE,BEGIN,BODY,BUS,BLOCK,BUFFER,CONSTANT,CASE,%
7145        COMPONENT,CONFIGURATION,DOWNTO,ELSE,ELSIF,END,ENTITY,EXIT,%
7146        FUNCTION,FOR,FILE,GENERIC,GENERATE,GUARDED,GROUP,IF,IN,INOUT,IS,%
7147        INERTIAL,IMPURE,LIBRARY,LOOP,LABEL,LITERAL,LINKAGE,MAP,MOD,NOT,%
7148        NOR,NAND,NULL,NEXT,NEW,OUT,OF,OR,OTHERS,ON,OPEN,PROCESS,PORT,%
7149        PACKAGE,PURE,PROCEDURE,POSTPONED,RANGE,REM,ROL,ROR,REPORT,RECORD,%
7150        RETURN,REGISTER,REJECT,SIGNAL,SUBTYPE,SLL,SRL,SLA,SRA,SEVERITY,%
7151        SELECT,THEN,TYPE,TRANSPORT,TO,USE,UNITS,UNTIL,VARIABLE,WHEN,WAIT,%
7152        WHILE,XOR,XNOR,%
7153        DISCONNECT,ELIF,WITH},% Arnaud Tisserand
7154    sensitive=f,% 1998 Gaurav Aggarwal
7155    morecomment=[l]--,%
7156    morestring=[d]{"}%
7157    }[keywords,comments,strings]
```

The VHDL-AMS dialect has been added by Steffen Klupsch.

```
7158 %%
7159 %% VHDL-AMS definition (c) Steffen Klupsch
7160 %%
7161 \lst@definelanguage[AMS]{VHDL}[]{VHDL}%
7162   {morekeywords={ACROSS,ARRAY,BREAK,DISCONNECT,NATURE,NOISE,PORT,%
7163       PROCEDURAL,QUANTITY,SHARED,SPECTRUM,SUBNATURE,TERMINAL,THROUGH,%
7164       TOLERANCE,UNAFFECTED,UNITS}}
```

7165 ⟨/lang1⟩

2.83 VRML

This language is due to Oliver BaumVRML.

7166 ⟨∗lang2⟩

```
7167 %%
7168 %% VRML definition (c) 2001 Oliver Baum
7169 %%
7170 \lst@definelanguage[97]{VRML}{%
7171   morekeywords={DEF, EXTERNPROTO, FALSE, IS, NULL, PROTO, ROUTE, TO, TRUE,%
7172     USE, eventIn, eventOut, exposedField, field, Introduction, Anchor,%
7173     Appearance, AudioClip, Background, Billboard, Box, Collision, Color,%
7174     ColorInterpolator, Cone, Coordinate, CoordinateInterpolator, Cylinder,%
7175     CylinderSensor, DirectionalLight, ElevationGrid, Extrusion, Fog,%
7176     FontStyle, Group, ImageTexture, IndexedFaceSet, IndexedLineSet, Inline,%
7177     LOD, Material, MovieTexture, NavigationInfo, Normal,%
7178     NormalInterpolator, OrientationInterpolator, PixelTexture, PlaneSensor,%
7179     PointLight, PointSet, PositionInterpolator, ProximitySensor,%
7180     ScalarInterpolator, Script, Shape, Sound, Sphere, SphereSensor,%
7181     SpotLight, Switch, Text, TextureCoordinate, TextureTransform,%
7182     TimeSensor, TouchSensor, Transform, Viewpoint, VisibilitySensor,%
7183     WorldInfo},%
7184   morecomment=[l]\#,% bug: starts comment in the first column
7185   morestring=[b]"%
7186 }[keywords,comments,strings]
```

7187 ⟨/lang2⟩

2.84 XML et al

Bernhard Walle provided the following two definitions.

7188 ⟨∗lang1⟩

```
7189 \lst@definelanguage{XSLT}[]{XML}%
7190   {morekeywords={%
7191       % main elements
7192       xsl:stylesheet, xsl:transform,%
7193       % childs of the main element
7194       xsl:apply-imports, xsl:attribute-set, xsl:decimal-format, xsl:import,%
7195       xsl:include, xsl:key, xsl:namespace-alias, xsl:output, xsl:param,%
7196       xsl:preserve-space, xsl:strip-space, xsl:template, xsl:variable,%
```

```
7197      % 21 directives
7198      xsl:apply-imports, xsl:apply-templates, xsl:attribute,%
7199      xsl:call-template, xsl:choose, xsl:comment, xsl:copy, xsl:copy-of,%
7200      xsl:element, xsl:fallback, xsl:for-each, xsl:if, xsl:message,%
7201      xsl:number, xsl:otherwise, xsl:processing-instruction, xsl:text,%
7202      xsl:value-of, xsl:variable, xsl:when, xsl:with-param},%
7203    alsodigit={-},%
7204    }%
7205 \lst@definelanguage{Ant}[]{XML}{%
7206    morekeywords={%
7207      project, target, patternset, include, exclude, excludesfile,%
7208      includesfile, filterset, filter, filtersfile, libfileset, custom,%
7209      classpath, fileset, none, depend, mapper, filename, not, date,%
7210      contains, selector, depth, or, and, present, majority, size, dirset,%
7211      filelist, pathelement, path, param, filterreader, extension,%
7212      filterchain, linecontainsregexp, regexp, classconstants, headfilter,%
7213      tabstospaces, striplinebreaks, tailfilter, stripjavacomments,%
7214      expandproperties, linecontains, replacetokens, token,%
7215      striplinecomments, comment, prefixlines, classfileset, rootfileset,%
7216      root, description, xmlcatalog, entity, dtd, substitution, extensionSet,%
7217      propertyfile, entry, vsscheckin, sql, transaction, cvspass, csc,%
7218      dirname, wlrun, wlclasspath, p4label, replaceregexp, get, jjtree,%
7219      sleep, jarlib, dependset, targetfileset, srcfileset, srcfilelist,%
7220      targetfilelist, zip, zipgroupfileset, zipfileset, patch, jspc, webapp,%
7221      style, test, arg, jvmarg, sysproperty, testlet, env, tstamp, format,%
7222      unwar, vsshistory, icontract, cvschangelog, user, p4submit, ccmcheckin,%
7223      p4change, bzip2, vssadd, javadoc, bottom, source, doctitle, header,%
7224      excludepackage, bootclasspath, doclet, taglet, packageset, sourcepath,%
7225      link, footer, package, group, title, tag, translate, signjar, vajload,%
7226      vajproject, jarlib, extensionset, WsdlToDotnet, buildnumber,%
7227      jpcovmerge, tomcat, ejbjar, weblogictoplink, jboss, borland, weblogic,%
7228      iplanet, jonas, support, websphere, wasclasspath, war, manifest,%
7229      attribute, section, metainf, lib, classes, webinf, rename, sequential,%
7230      serverdeploy, generic, property, move, copydir, cccheckin, wljspc,%
7231      fixcrlf, sosget, pathconvert, map, record, p4sync, exec, p4edit,%
7232      maudit, rulespath, searchpath, antlr, netrexxc, jpcovreport, reference,%
7233      filters, coveragepath, execon, targetfile, srcfile, ccmcheckout, ant,%
7234      xmlvalidate, xslt, iplanet, ccmcheckintask, gzip, native2ascii,%
7235      starteam, ear, archives, input, rmic, extdirs, compilerarg, checksum,%
7236      mail, bcc, message, cc, to, from, loadfile, vsscheckout, stylebook,%
7237      soscheckin, mimemail, stlabel, gunzip, concat, cab, touch, parallel,%
7238      splash, antcall, cccheckout, typedef, p4have, xmlproperty, copy,%
7239      tomcat, antstructure, ccmcreatetask, rpm, delete, replace,%
7240      replacefilter, replacetoken, replacevalue, mmetrics, waitfor, isfalse,%
7241      equals, available, filepath, os, filesmatch, istrue, isset, socket,%
7242      http, uptodate, srcfiles, untar, loadproperties, echoproperties,%
7243      vajexport, stcheckout, bunzip2, copyfile, vsscreate, ejbc, unjar,%
7244      tomcat, wsdltodotnet, mkdir, condition, cvs, commandline, marker,%
7245      argument, tempfile, junitreport, report, taskdef, echo, ccupdate, java,%
```

```
7246      renameext, vsslabel, basename, javadoc2, vsscp, tar, tarfileset,%
7247      tomcat, vajimport, setproxy, wlstop, p4counter, ilasm, soscheckout,%
7248      apply, ccuncheckout, jarlib, location, url, cvstagdiff, jlink,%
7249      mergefiles, addfiles, javacc, pvcs, pvcsproject, jarlib, options,%
7250      depends, chmod, jar, sound, fail, success, mparse, blgenclient, genkey,%
7251      dname, javah, class, ccmreconfigure, unzip, javac, src, p4add,%
7252      soslabel, jpcoverage, triggers, method, vssget, deltree, ddcreator},%
7253    deletekeywords={default},%
7254 }
```

7255 ⟨/lang1⟩

This is my first attempt to support XML. It is from 2000/07/18.

7256 ⟨∗lang1⟩

```
7257 \lst@definelanguage{XML}%
7258    {keywords={,CDATA,DOCTYPE,ATTLIST,termdef,ELEMENT,EMPTY,ANY,ID,%
7259        IDREF,IDREFS,ENTITY,ENTITIES,NMTOKEN,NMTOKENS,NOTATION,%
7260        INCLUDE,IGNORE,SYSTEM,PUBLIC,NDATA,PUBLIC,%
7261        PCDATA,REQUIRED,IMPLIED,FIXED,%%% preceded by #
7262        xml,xml:space,xml:lang,version,standalone,default,preserve},%
7263    alsoother=$,%
7264    alsoletter=:,%
7265    tag=**[s]<>,%
7266    morestring=[d]",% ??? doubled
7267    morestring=[d]',% ??? doubled
7268    MoreSelectCharTable=%
7269        \lst@CArgX--\relax\lst@DefDelimB{}{}%
7270            {\ifnum\lst@mode=\lst@tagmode\else
7271                \expandafter\@gobblethree
7272             \fi}%
7273            \lst@BeginComment\lst@commentmode{{\lst@commentstyle}}%
7274        \lst@CArgX--\relax\lst@DefDelimE{}{}{}%
7275            \lst@EndComment\lst@commentmode
7276        \lst@CArgX[CDATA[\relax\lst@CDef{}%
7277            {\ifnum\lst@mode=\lst@tagmode
7278                \expandafter\lst@BeginCDATA
7279             \else \expandafter\lst@CArgEmpty
7280             \fi}%
7281            \@empty
7282        \lst@CArgX]]\relax\lst@CDef{}%
7283            {\ifnum\lst@mode=\lst@GPmode
7284                \expandafter\lst@EndComment
7285             \else \expandafter\lst@CArgEmpty
7286             \fi}%
7287            \@empty
7288    }[keywords,comments,strings,html]%
```

And after receiving a bug report from Michael Niedermair I converted the version 0.21 contents of `MoreSelectCharTable` to version 1.0.

7289 ⟨/lang1⟩