# Language, Style and Format drivers
# for Listings

by Carsten Heinz and individual authors:

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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 1.3 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 }
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-lua.prf}{\from{lstdrvrs.dtx}{lua-prf}}
39     \file{listings-python.prf}{\from{lstdrvrs.dtx}{python-prf}}
40 }
41
42
43 \ifToplevel{
44 \Msg{*}
45 \Msg{* You probably need to move all created '.sty' and '.cfg'}
46 \Msg{* files into a directory searched by TeX.}
47 \Msg{*}
48 \Msg{* Run 'lstdrvrs.dtx' through LaTeX2e to get the documentation.}
49 \Msg{*}
50 }
51
52 \endbatchfile
53 ⟨/install⟩

54 ⟨*config⟩
```

We mainly define default dialects.

```
55 \ProvidesFile{listings.cfg}[2018/09/02 1.7 listings configuration]
56 \def\lstlanguagefiles
57     {lstlang0.sty,lstlang1.sty,lstlang2.sty,lstlang3.sty}
58 \lstset{defaultdialect=[R/3 6.10]ABAP,
59         defaultdialect=[2005]Ada,
60         defaultdialect=[68]Algol,
61         defaultdialect=[gnu]Awk,
62         defaultdialect=[ANSI]C,
63         defaultdialect=[light]Caml,
64         defaultdialect=[1985]Cobol,
65         defaultdialect=[WinXP]command.com,
66         defaultdialect=[ISO]C++,
67         defaultdialect=[95]Fortran,
68         defaultdialect=[11.0]Mathematica,
69         defaultdialect=[OMG]OCL,
70         defaultdialect=[Standard]Pascal,
71         defaultdialect=[67]Simula,
72         defaultdialect=[plain]TeX,
73         defaultdialect=[97]VRML}
74 \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 fin-
ished). The version number with letter is important for the runtime-system, but

the programming language should be the same for each version.

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

78 ⟨/config⟩

79 ⟨+lang1⟩\ProvidesFile{lstlang1.sty}
80 ⟨+lang2⟩\ProvidesFile{lstlang2.sty}
81 ⟨+lang3⟩\ProvidesFile{lstlang3.sty}
82 ⟨+acm-prf⟩\ProvidesFile{listings-acm.prf}
83 ⟨+bash-prf⟩\ProvidesFile{listings-bash.prf}
84 ⟨+fortran-prf⟩\ProvidesFile{listings-fortran.prf}
85 ⟨+lua-prf⟩\ProvidesFile{listings-lua.prf}
86 ⟨+python-prf⟩\ProvidesFile{listings-python.prf}
87 ⟨-config⟩    [2018/09/02 1.7 listings language file]
```

# 2 Language drivers

## 2.1 Abap

Knut Lickert added support for Abap.[1]

```
88 ⟨*lang2⟩

89 %%
90 %% Abap definition by Knut Lickert
91 %%
```

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.

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

95 \lst@definelanguage[R/3 4.6C]{ABAP}[R/3 3.1]{ABAP}%
96   {morekeywords={method,ref,class,create,object,%
97        methods,endmethod,private,protected,public,section,%
98        catch,system-exceptions,endcatch,%
99        },%
100    moreprocnamekeys={class},%
101    literate={->}{{$\rightarrow$}}1{=>}{{$\Rightarrow$}}1,%
102    }[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.

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

---

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

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.

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

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

```
137 \lst@definelanguage[R/2 4.3]{ABAP}[R/2 5.0]{ABAP}%
138   {deletekeywords={function,importing,exporting,changing,exceptions,%
139         raise,raising}%
140   }[keywords,comments,strings]

141 ⟨/lang2⟩
```

## 2.2 ACM

ACM is the language of the Aspen Custom Modeler (http://www.aspentech.com/products/aspen-custom-modeler.aspx), the language definition was pro-

vided by Stefan Pinnow. It is intended for writing models. Maximilian Dammann pointed out the missing keyword "Description".

```
142 ⟨∗lang2⟩

143 %%
144 %% ACM and ACMscript definition
145 %% (c) 2013 Stefan Pinnow
146 %%
147 \lst@definelanguage{ACM}{
148   morekeywords={
149     abs,After,acos,And,As,asin,atan,At,Call,Compatibility,Connect,cos,cosh,%
150     Create,Delay,Description,Difference,Do,Else,ElseIf,End,EndFor,EndIf,%
151     EndParallel,EndState,EndSwitch,EndText,EndWith,exp,External,Fixed,For,%
152     ForEach,Free,Global,Hidden,If,Implementation,In,Initial,Input,InterSection,%
153     IntegerSet,Invoke,Is,Language,Library,Link,Log10,LogE,Max,Min,Model,Of,%
154     Once,Options,Output,Parallel,Parameter,Pause,Port,Print,Private,%
155     Procedure,Product,Ramp,Repeat,Restart,Return,Round,Runs,Sigma,sin,sinh,%
156     Size,SnapShot,sqr,sqrt,SRamp,State,Stream,StringSet,Structure,Switch,%
157     SubRoutine,SymDiff,tan,tanh,Task,Text,Time,Then,Truncate,Union,Until,%
158     Uses,Variable,Wait,When,With,WithIn,WorkSpace%
159   },%
160   sensitive=false,%
161   morecomment=[l]{//},%
162   morecomment=[s]{/*}{*/},%
163   string=[b]{"},%
164 }[keywords,comments,strings]%

165 ⟨/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.

```
166 ⟨∗lang2⟩

167 \lst@definelanguage{ACMscript}[]{VBScript}{%
168   morekeywords={%
169     ElseIf,False,In,Resume,True%
170   },%
171   deletekeywords={%
172     Abs,Array,Clear,CreateObject,CStr,Err,ForReading,ForWriting,%
173     OpenTextFile,Replace,WriteLine%
174   }%
175 }[keywords,comments,strings]%

176 ⟨/lang2⟩
```

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

```
177 ⟨∗acm-prf⟩

178 \usepackage[rgb, x11names]{xcolor}
179
180 \definecolor{Comments}{rgb}{0.00,0.50,0.00}
181 \definecolor{KeyWords}{rgb}{0.00,0.00,0.63}
```

```
182 \definecolor{Strings}{rgb}{0.84,0.00,0.00}
183
184 \lstdefinestyle{ACM}{%
185   basicstyle=\scriptsize\ttfamily,%
186   keywordstyle=\color{KeyWords},%
187   showstringspaces=false,%
188   identifierstyle=\color{black},%
189   commentstyle=\color{Comments},%
190   stringstyle=\color{Strings},%
191   frame=shadowbox,%              % for ACM-Code scrartcl commented out
192 %   frame=l,%                    % line on the left side
193   rulesepcolor=\color{black},%
194   numbers=left,%                 % left
195   firstnumber=1,%
196   stepnumber=5,%
197   columns=fixed,%                % to prevent inserting spaces
198   fontadjust=true,%
199   basewidth=0.5em,%
200   captionpos=t,%
201   abovecaptionskip=\smallskipamount,% same amount as default
202   belowcaptionskip=\smallskipamount,% in caption package
203 }%
```

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

```
204 ⟨/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.

```
205 ⟨∗lang1⟩
206 %%
207 %% ACSL definition (c) 2000 by Andreas Matthias
208 %%
209 \lst@definelanguage{ACSL}[90]{Fortran}%
210    {morekeywords={algorithm,cinterval,constant,derivative,discrete,%
211        dynamic,errtag,initial,interval,maxterval,minterval,%
212        merror,xerror,nsteps,procedural,save,schedule,sort,%
213        table,terminal,termt,variable},%
214     sensitive=false,%
215     morecomment=[l]!%
216    }[keywords, comments]%
217 ⟨/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.

218 ⟨∗lang1⟩

```
219 %%
220 %% Ada 95 definition (c) Torsten Neuer
221 %%
222 %% Ada 2005 definition (c) 2006 Santiago Urue\~{n}a Pascual
223 %%                         <Santiago.Uruena@upm.es>
224 %%
225 \lst@definelanguage[2005]{Ada}[95]{Ada}%
226   {morekeywords={interface,overriding,synchronized}}%

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

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

242 ⟨/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 ¢.

243 ⟨∗lang3⟩

```
244 \lst@definelanguage[68]{Algol}%
245 % ??? should 'i' be a keyword
246   {morekeywords={abs,and,arg,begin,bin,bits,bool,by,bytes,case,channel,%
```

9

```
247      char,co,comment,compl,conj,divab,do,down,elem,elif,else,empty,%
248      end,entier,eq,esac,exit,false,fi,file,flex,for,format,from,ge,%
249      goto,gt,heap,if,im,in,int,is,isnt,le,leng,level,loc,long,lt,lwb,%
250      minusab,mod,modab,mode,ne,nil,not,od,odd,of,op,or,ouse,out,over,%
251      overab,par,plusab,plusto,pr,pragmat,prio,proc,re,real,ref,repr,%
252      round,sema,shl,short,shorten,shr,sign,skip,string,struct,then,%
253      timesab,to,true,union,up,upb,void,while},%
254    sensitive=f,% ???
255    morecomment=[s]{\#}{\#},%
256    keywordcomment={co,comment}%
257    }[keywords,comments,keywordcomments]%

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

## 2.6   Assembler

Credits go to Michael Franke.

```
266 ⟨*lang3⟩
267 %%
268 %% Motorola 68K definition (c) 2006 Michael Franke
269 %%
270 \lst@definelanguage[Motorola68k]{Assembler}%
271    {morekeywords={ABCD,ADD,%
272 ADDA,ADDI,ADDQ,ADDX,AND,ANDI,ASL,ASR,BCC,BLS,BCS,BLT,BEQ,BMI,BF,BNE,BGE,BPL,%
273 BGT,BT,BHI,BVC,BLE,BVS,BCHG,BCLR,BRA,BSET,BSR,BTST,CHK,CLR,CMP,CMPA,CMPI,CMPM,%
274 DBCC,DBLS,DBCS,DBLT,DBEQ,DBMI,DBF,DBNE,DBGE,DBPL,DBGT,DBT,DBHI,DBVC,DBLE,DBVS,DIVS,%
275 DIVU,EOR,EORI,EXG,EXT,ILLEGAL,JMP,JSR,LEA,LINK,LSL,LSR,MOVE,MOVEA,MOVEM,MOVEP,MOVEQ,%
276 MULS,MULU,NBCD,NEG,NEGX,NOP,NOT,OR,ORI,PEA,RESET,ROL,ROR,ROXL,ROXR,RTE,RTR,RTS,SBCD,%
277 SCC,SLS,SCS,SLT,SEQ,SMI,SF,SNE,SGE,SPL,SGT,ST,SHI,SVC,SLE,SVS,STOP,SUB,SUBA,SUBI,SUBQ,%
278 SUBX,SWAP,TAS,TRAP,TRAPV,TST,UNLK},%
279      sensitive=false,%
280      morecomment=[l]*,%
281      morecomment=[l];%
282      }[keywords,comments,strings]
283 ⟨/lang3⟩
```

Credits go to Andrew Zabolotny.

```
284 ⟨*lang3⟩
285 %%
286 %% x86masm definition (c) 2002 Andrew Zabolotny
287 %%
288 \lst@definelanguage[x86masm]{Assembler}%
289    {morekeywords={al,ah,ax,eax,bl,bh,bx,ebx,cl,ch,cx,ecx,dl,dh,dx,edx,%
```

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

## 2.7  Awk

Thanks to Dr. Christoph Giess for providing these definitions.

```
332 ⟨*lang1⟩
333 %%
334 %% awk definitions (c) Christoph Giess
```

```
335 %%
336 \lst@definelanguage[gnu]{Awk}[POSIX]{Awk}%
337    {morekeywords={and,asort,bindtextdomain,compl,dcgettext,gensub,%
338        lshift,mktime,or,rshift,strftime,strtonum,systime,xor,extension}%
339    }%

340 \lst@definelanguage[POSIX]{Awk}%
341    {keywords={BEGIN,END,close,getline,next,nextfile,print,printf,%
342        system,fflush,atan2,cos,exp,int,log,rand,sin,sqrt,srand,gsub,%
343        index,length,match,split,sprintf,strtonum,sub,substr,tolower,%
344        toupper,if,while,do,for,break,continue,delete,exit,function,%
345        return},%
346    sensitive,%
347    morecomment=[l]\#,%
348    morecomment=[l]//,%
349    morecomment=[s]{/*}{*/},%
350    morestring=[b]"%
351    }[keywords,comments,strings]%
352 ⟨/lang1⟩
```

## 2.8  Basic

Credits go to Robert Frank.

```
353 ⟨*lang1⟩
354 %%
355 %% Visual Basic definition (c) 2002 Robert Frank
356 %%
357 \lst@definelanguage[Visual]{Basic}
358    {morekeywords={Abs,Array,Asc,AscB,AscW,Atn,Avg,CBool,CByte,CCur,%
359        CDate,CDbl,Cdec,Choose,Chr,ChrB,ChrW,CInt,CLng,Command,Cos,%
360        Count,CreateObject,CSng,CStr,CurDir,CVar,CVDate,CVErr,Date,%
361        DateAdd,DateDiff,DatePart,DateSerial,DateValue,Day,DDB,Dir,%
362        DoEvents,Environ,EOF,Error,Exp,FileAttr,FileDateTime,FileLen,%
363        Fix,Format,FreeFile,FV,GetAllStrings,GetAttr,%
364        GetAutoServerSettings,GetObject,GetSetting,Hex,Hour,IIf,%
365        IMEStatus,Input,InputB,InputBox,InStr,InstB,Int,Integer,IPmt,%
366        IsArray,IsDate,IsEmpty,IsError,IsMissing,IsNull,IsNumeric,%
367        IsObject,LBound,LCase,Left,LeftB,Len,LenB,LoadPicture,Loc,LOF,%
368        Log,Ltrim,Max,Mid,MidB,Min,Minute,MIRR,Month,MsgBox,Now,NPer,%
369        NPV,Oct,Partition,Pmt,PPmt,PV,QBColor,Rate,RGB,Right,RightB,Rnd,%
370        Rtrim,Second,Seek,Sgn,Shell,Sin,SLN,Space,Spc,Sqr,StDev,StDevP,%
371        Str,StrComp,StrConv,String,Switch,Sum,SYD,Tab,Tan,Time,Timer,%
372        TimeSerial,TimeValue,Trim,TypeName,UBound,Ucase,Val,Var,VarP,%
373        VarType,Weekday,Year},% functions
374    morekeywords=[2]{Accept,Activate,Add,AddCustom,AddFile,AddFromFile,%
375        AddFromTemplate,AddItem,AddNew,AddToAddInToolbar,%
376        AddToolboxProgID,Append,AppendChunk,Arrange,Assert,AsyncRead,%
377        BatchUpdate,BeginTrans,Bind,Cancel,CancelAsyncRead,CancelBatch,%
378        CancelUpdate,CanPropertyChange,CaptureImage,CellText,CellValue,%
379        Circle,Clear,ClearFields,ClearSel,ClearSelCols,Clone,Close,Cls,%
```

```
380    ColContaining,ColumnSize,CommitTrans,CompactDatabase,Compose,%
381    Connect,Copy,CopyQueryDef,CreateDatabase,CreateDragImage,%
382    CreateEmbed,CreateField,CreateGroup,CreateIndex,CreateLink,%
383    CreatePreparedStatement,CreatePropery,CreateQuery,%
384    CreateQueryDef,CreateRelation,CreateTableDef,CreateUser,%
385    CreateWorkspace,Customize,Delete,DeleteColumnLabels,%
386    DeleteColumns,DeleteRowLabels,DeleteRows,DoVerb,Drag,Draw,Edit,%
387    EditCopy,EditPaste,EndDoc,EnsureVisible,EstablishConnection,%
388    Execute,ExtractIcon,Fetch,FetchVerbs,Files,FillCache,Find,%
389    FindFirst,FindItem,FindLast,FindNext,FindPrevious,Forward,%
390    GetBookmark,GetChunk,GetClipString,GetData,GetFirstVisible,%
391    GetFormat,GetHeader,GetLineFromChar,GetNumTicks,GetRows,%
392    GetSelectedPart,GetText,GetVisibleCount,GoBack,GoForward,Hide,%
393    HitTest,HoldFields,Idle,InitializeLabels,InsertColumnLabels,%
394    InsertColumns,InsertObjDlg,InsertRowLabels,InsertRows,Item,%
395    KillDoc,Layout,Line,LinkExecute,LinkPoke,LinkRequest,LinkSend,%
396    Listen,LoadFile,LoadResData,LoadResPicture,LoadResString,%
397    LogEvent,MakeCompileFile,MakeReplica,MoreResults,Move,MoveData,%
398    MoveFirst,MoveLast,MoveNext,MovePrevious,NavigateTo,NewPage,%
399    NewPassword,NextRecordset,OLEDrag,OnAddinsUpdate,OnConnection,%
400    OnDisconnection,OnStartupComplete,Open,OpenConnection,%
401    OpenDatabase,OpenQueryDef,OpenRecordset,OpenResultset,OpenURL,%
402    Overlay,PaintPicture,Paste,PastSpecialDlg,PeekData,Play,Point,%
403    PopulatePartial,PopupMenu,Print,PrintForm,PropertyChanged,Pset,%
404    Quit,Raise,RandomDataFill,RandomFillColumns,RandomFillRows,%
405    rdoCreateEnvironment,rdoRegisterDataSource,ReadFromFile,%
406    ReadProperty,Rebind,ReFill,Refresh,RefreshLink,RegisterDatabase,%
407    Reload,Remove,RemoveAddInFromToolbar,RemoveItem,Render,%
408    RepairDatabase,Reply,ReplyAll,Requery,ResetCustom,%
409    ResetCustomLabel,ResolveName,RestoreToolbar,Resync,Rollback,%
410    RollbackTrans,RowBookmark,RowContaining,RowTop,Save,SaveAs,%
411    SaveFile,SaveToFile,SaveToolbar,SaveToOle1File,Scale,ScaleX,%
412    ScaleY,Scroll,Select,SelectAll,SelectPart,SelPrint,Send,%
413    SendData,Set,SetAutoServerSettings,SetData,SetFocus,SetOption,%
414    SetSize,SetText,SetViewport,Show,ShowColor,ShowFont,ShowHelp,%
415    ShowOpen,ShowPrinter,ShowSave,ShowWhatsThis,SignOff,SignOn,Size,%
416    Span,SplitContaining,StartLabelEdit,StartLogging,Stop,%
417    Synchronize,TextHeight,TextWidth,ToDefaults,TwipsToChartPart,%
418    TypeByChartType,Update,UpdateControls,UpdateRecord,UpdateRow,%
419    Upto,WhatsThisMode,WriteProperty,ZOrder},% methods
420  morekeywords=[3]{AccessKeyPress,AfterAddFile,AfterChangeFileName,%
421    AfterCloseFile,AfterColEdit,AfterColUpdate,AfterDelete,%
422    AfterInsert,AfterLabelEdit,AfterRemoveFile,AfterUpdate,%
423    AfterWriteFile,AmbienChanged,ApplyChanges,Associate,%
424    AsyncReadComplete,AxisActivated,AxisLabelActivated,%
425    AxisLabelSelected,AxisLabelUpdated,AxisSelected,%
426    AxisTitleActivated,AxisTitleSelected,AxisTitleUpdated,%
427    AxisUpdated,BeforeClick,BeforeColEdit,BeforeColUpdate,%
428    BeforeConnect,BeforeDelete,BeforeInsert,BeforeLabelEdit,%
429    BeforeLoadFile,BeforeUpdate,ButtonClick,ButtonCompleted,%
```

```
430        ButtonGotFocus,ButtonLostFocus,Change,ChartActivated,%
431        ChartSelected,ChartUpdated,Click,ColEdit,Collapse,ColResize,%
432        ColumnClick,Compare,ConfigChageCancelled,ConfigChanged,%
433        ConnectionRequest,DataArrival,DataChanged,DataUpdated,DblClick,%
434        Deactivate,DeviceArrival,DeviceOtherEvent,DeviceQueryRemove,%
435        DeviceQueryRemoveFailed,DeviceRemoveComplete,DeviceRemovePending,%
436        DevModeChange,Disconnect,DisplayChanged,Dissociate,%
437        DoGetNewFileName,Done,DonePainting,DownClick,DragDrop,DragOver,%
438        DropDown,EditProperty,EnterCell,EnterFocus,Event,ExitFocus,%
439        Expand,FootnoteActivated,FootnoteSelected,FootnoteUpdated,%
440        GotFocus,HeadClick,InfoMessage,Initialize,IniProperties,%
441        ItemActivated,ItemAdded,ItemCheck,ItemClick,ItemReloaded,%
442        ItemRemoved,ItemRenamed,ItemSeletected,KeyDown,KeyPress,KeyUp,%
443        LeaveCell,LegendActivated,LegendSelected,LegendUpdated,%
444        LinkClose,LinkError,LinkNotify,LinkOpen,Load,LostFocus,%
445        MouseDown,MouseMove,MouseUp,NodeClick,ObjectMove,%
446        OLECompleteDrag,OLEDragDrop,OLEDragOver,OLEGiveFeedback,%
447        OLESetData,OLEStartDrag,OnAddNew,OnComm,Paint,PanelClick,%
448        PanelDblClick,PathChange,PatternChange,PlotActivated,%
449        PlotSelected,PlotUpdated,PointActivated,PointLabelActivated,%
450        PointLabelSelected,PointLabelUpdated,PointSelected,%
451        PointUpdated,PowerQuerySuspend,PowerResume,PowerStatusChanged,%
452        PowerSuspend,QueryChangeConfig,QueryComplete,QueryCompleted,%
453        QueryTimeout,QueryUnload,ReadProperties,Reposition,%
454        RequestChangeFileName,RequestWriteFile,Resize,ResultsChanged,%
455        RowColChange,RowCurrencyChange,RowResize,RowStatusChanged,%
456        SelChange,SelectionChanged,SendComplete,SendProgress,%
457        SeriesActivated,SeriesSelected,SeriesUpdated,SettingChanged,%
458        SplitChange,StateChanged,StatusUpdate,SysColorsChanged,%
459        Terminate,TimeChanged,TitleActivated,TitleSelected,%
460        TitleActivated,UnboundAddData,UnboundDeleteRow,%
461        UnboundGetRelativeBookmark,UnboundReadData,UnboundWriteData,%
462        Unload,UpClick,Updated,Validate,ValidationError,WillAssociate,%
463        WillChangeData,WillDissociate,WillExecute,WillUpdateRows,%
464        WithEvents,WriteProperties},% VB-events
465    morekeywords=[4]{AppActivate,Base,Beep,Call,Case,ChDir,ChDrive,%
466        Const,Declare,DefBool,DefByte,DefCur,DefDate,DefDbl,DefDec,%
467        DefInt,DefLng,DefObj,DefSng,DefStr,Deftype,DefVar,DeleteSetting,%
468        Dim,Do,Else,ElseIf,End,Enum,Erase,Event,Exit,Explicit,FileCopy,%
469        For,ForEach,Friend,Function,Get,GoSub,GoTo,If,Implements,Kill,%
470        Let,LineInput,Lock,Lset,MkDir,Name,Next,OnError,On,Option,%
471        Private,Property,Public,Put,RaiseEvent,Randomize,ReDim,Rem,%
472        Reset,Resume,Return,RmDir,Rset,SavePicture,SaveSetting,%
473        SendKeys,SetAttr,Static,Sub,Then,Type,Unlock,Wend,While,Width,%
474        With,Write},% statements
475    sensitive=false,%
476    keywordcomment=rem,%
477    MoreSelectCharTable=\def\lst@BeginKC@{% chmod
478        \lst@ResetToken
479        \lst@BeginComment\lst@GPmode{{\lst@commentstyle}%
```

```
480                              \lst@Lmodetrue\lst@modetrue}\@empty},%
481    morecomment=[l]{'},%
482    morecomment=[s]{/*}{*/},%
483    morestring=[b]",%
484    }[keywords,comments,strings,keywordcomments]
485 ⟨/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

```
486 ⟨*lang3⟩
487 %%
488 %% Clean definition (c) 1999 Jos\'e Romildo Malaquias
489 %%
490 %% Clean 1.3 :  some standard functional language: pure, lazy,
491 %%             polymorphic type system, modules, type classes,
492 %%             garbage collection, functions as first class citizens
493 %%
494 \lst@definelanguage{Clean}%
495   {otherkeywords={:,::,=,:==,=:,=>,->,<-,<-:,\{,\},\{|,|\},\#,\#!,|,\&,%
496      [,],!,.,\\\\,;,_},%
497    morekeywords={from,definition,implementation,import,module,system,%
498      case,code,if,in,let,let!,of,where,with,infix,infixl,infixr},%
499    morendkeywords={True,False,Start,Int,Real,Char,Bool,String,World,%
500      File,ProcId},%
501    sensitive,%
502    morecomment=[l]//,% missing comma: Markus Pahlow
503    morecomment=[n]{/*}{*/},%
504    morestring=[b]"%
505   }[keywords,comments,strings]%
506 ⟨/lang3⟩
```

## 2.10   Corba IDL

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

```
507 ⟨*lang2⟩
508 %%
509 %% Corba IDL definition (c) 1999 Jens T. Berger Thielemann
510 %%
511 \lst@definelanguage[CORBA]{IDL}%
512   {morekeywords={any,attribute,boolean,case,char,const,context,default,%
513      double,enum,exception,fixed,float,in,inout,interface,long,module,%
514      native,Object,octet,oneway,out,raises,readonly,sequence,short,%
515      string,struct,switch,typedef,union,unsigned,void,wchar,wstring,%
516      FALSE,TRUE},%
```

```
517    sensitive,%
518    moredirectives={define,elif,else,endif,error,if,ifdef,ifndef,line,%
519       include,pragma,undef,warning},%
520    moredelim=*[directive]\#,%
521    morecomment=[l]//,%
522    morecomment=[s]{/*}{*/},%
523    morestring=[b]"%
524    }[keywords,comments,strings,directives]%
525 ⟨/lang2⟩
```

## 2.11   C, C++, et al

```
526 ⟨*lang1⟩
```

Michael Fiedler provided the following list of new introduced keywords for C++11.
```
527 \lst@definelanguage[11]{C++}[ISO]{C++}%
528    {morekeywords={alignas,alignof,char16_t,char32_t,constexpr,%
529       decltype,noexcept,nullptr,static_assert,thread_local},%
530    }%
```

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

Michael Piefel suggested some more changes and added GNU C++.
```
532 \lst@definelanguage[GNU]{C++}[ISO]{C++}%
533    {morekeywords={__attribute__,__extension__,__restrict,__restrict__,%
534       typeof,__typeof__},%
535    }%
536 \lst@definelanguage[Visual]{C++}[ISO]{C++}%
537    {morekeywords={__asm,__based,__cdecl,__declspec,dllexport,%
538       dllimport,__except,__fastcall,__finally,__inline,__int8,__int16,%
539       __int32,__int64,naked,__stdcall,thread,__try,__leave},%
540    }%
541 \lst@definelanguage[ISO]{C++}[ANSI]{C}%
542    {morekeywords={and,and_eq,asm,bad_cast,bad_typeid,bitand,bitor,bool,%
543       catch,class,compl,const_cast,delete,dynamic_cast,explicit,export,%
544       false,friend,inline,mutable,namespace,new,not,not_eq,operator,or,%
545       or_eq,private,protected,public,reinterpret_cast,static_cast,%
546       template,this,throw,true,try,typeid,type_info,typename,using,%
547       virtual,wchar_t,xor,xor_eq},%
548    }%
549 ⟨/lang1⟩
```

Objective-C is due to Detlev Dröge.
```
550 ⟨*lang1⟩
551 %%
552 %% Objective-C definition (c) 1997 Detlev Droege
553 %%
554 \lst@definelanguage[Objective]{C}[ANSI]{C}
```

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```
555    {morekeywords={bycopy,id,in,inout,oneway,out,self,super,%
556        @class,@defs,@encode,@end,@implementation,@interface,@private,%
557        @protected,@protocol,@public,@selector},%
558      moredirectives={import}%
559    }%
```

560 ⟨/lang1⟩

Jörg Viermann provided the keywords for Handel-C.

561 ⟨∗lang1⟩

```
562 %%
563 %% Handel-C definition, refer http://www.celoxica.com
564 %%
565 \lst@definelanguage[Handel]{C}[ANSI]{C}
566    {morekeywords={assert,chan,chanin,chanout,clock,delay,expr,external,%
567        external_divide,family,ifselect,in,inline,interface,internal,%
568        internal_divid,intwidth,let,macro,mpram,par,part,prialt,proc,ram,%
569        releasesema,reset,rom,select,sema,set,seq,shared,signal,try,%
570        reset,trysema,typeof,undefined,width,with,wom},%
571    }%
```

572 ⟨/lang1⟩

573 ⟨∗lang1⟩

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

588 ⟨/lang1⟩

589 ⟨∗lang1⟩

Thanks go to Martin Brodbeck.

```
590 %%
591 %% C-Sharp definition (c) 2002 Martin Brodbeck
592 %%
593 \lst@definelanguage[Sharp]{C}%
594    {morekeywords={abstract,base,bool,break,byte,case,catch,char,checked,%
595        class,const,continue,decimal,default,delegate,do,double,else,%
596        enum,event,explicit,extern,false,finally,fixed,float,for,foreach,%
597        goto,if,implicit,in,int,interface,internal,is,lock,long,%
```

```
598        namespace,new,null,object,operator,out,override,params,private,%
599        protected,public,readonly,ref,return,sbyte,sealed,short,sizeof,%
600        static,string,struct,switch,this,throw,true,try,typeof,uint,%
601        ulong,unchecked,unsafe,ushort,using,virtual,void,while,%
602        as,volatile,stackalloc},% Kai K\"ohne
603      sensitive,%
604      morecomment=[s]{/*}{*/},%
605      morecomment=[l]//,%
606      morestring=[b]"
607    }[keywords,comments,strings]%
608 ⟨/lang1⟩
```

## 2.12 Caml and Objective Caml

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

```
609 ⟨*lang2⟩
```

```
610 %%
611 %% (Objective) Caml definition (c) 1999 Patrick Cousot
612 %%
613 %% Objective CAML and Caml light are freely available, together with a
614 %% reference manual, at URL ftp.inria.fr/lang/caml-light for the Unix,
615 %% Windows and Macintosh OS operating systems.
616 %%
617 \lst@definelanguage[Objective]{Caml}[light]{Caml}
618    {deletekeywords={not,prefix,value,where},%
619     morekeywords={assert,asr,class,closed,constraint,external,false,%
620        functor,include,inherit,land,lazy,lor,lsl,lsr,lxor,method,mod,%
621        module,new,open,parser,private,sig,struct,true,val,virtual,when,%
622        object,ref},% TH
623    }%
624 \lst@definelanguage[light]{Caml}
625    {morekeywords={and,as,begin,do,done,downto,else,end,exception,for,%
626        fun,function,if,in,let,match,mutable,not,of,or,prefix,rec,then,%
627        to,try,type,value,where,while,with},%
628     sensitive,%
629     morecomment=[n]{(*}{*)},%
630     morestring=[b]",%
631     moredelim=*[directive]\#,%
632     moredirectives={open,close,include}%
633    }[keywords,comments,strings,directives]%
634 ⟨/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

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out that the support for Algol was broken, but that came from a long missing '@'
in the following `lst@definelanguage`.

```
635 ⟨*lang3⟩
636 \lst@definelanguage{CIL}%
637   {morekeywords=[1]{assembly,beforefieldinit,class,default,cdecl,cil,corflags,%
638                   culture,custom,data,entrypoint,fastcall,field,file,%
639                   hidebysig,hash,il,imagebase,locals,managed,marshall,%
640                   maxstack,mresource,method,module,namespace,publickey,%
641                   stdcall,subsystem,thiscall,unmanaged,vararg,ver,vtfixup,%
642                   % types
643                   bool,char,float32,float64,int,int8,int16,int32,%
644                   int64,method,native,object,string,modopt,modreq,pinned,%
645                   typedref,valuetype,unsigned,void,%
646                   % defining types
647                   abstract,ansi,auto,autochar,beforefieldinit,boxed,class,%
648                   explicit,extends,implements,interface,famandassem,family,%
649                   famorassem,inherits,nested,override,pack,private,property,%
650                   public,rtspecialname,sealed,sequential,serializable,size,%
651                   specialname,static,unicode,%
652                   % postfix
653                   algorithm,alignment,extern,init,from,nometadata,with},%
654   morekeywords=[2]{add,and,arglist,beq,bge,bgt,ble,blt,bne,br,break,brfalse,%
655                   brtrue,call,calli,ceq,cgt,ckfinite,clt,conv,cpblk,div,%
656                   dup,endfilter,endfinally,initblk,jmp,ldarg,ldarga,ldc,%
657                   ldftn,ldind,ldloc,ldloca,ldnull,leave,localloc,mul,neg,%
658                   nop,not,or,pop,rem,ret,shl,shr,starg,stind,stloc,sub,%
659                   switch,xor,%
660                   % prefix
661                   tail,unaligned,volatile,%
662                   % postfix
663                   un,s,ovf,%
664                   % object
665                   box,callvirt,castclass,cpobj,cctor,ctor,initobj,isinst,%
666                   ldelem,ldelema,ldfld,ldflda,ldlen,ldobj,ldsfld,ldsflda,%
667                   ldstr,ldtoken,ldvirtftn,mkrefany,newarr,newobj,refanytype,%
668                   refanyval,rethrow,sizeof,stelem,stfld,stobj,stsfld,throw,%
669                   unbox},%
670   sensitive=true,%
671   morecomment=[l]{//},%
672   morestring=[b]"%
673 }[keywords,comments,strings]%
674 ⟨/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

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happens if the double quote is not doubled to insert a quote, e.g. `""bad" cobol"` won't be printed correctly.

```
675 ⟨∗lang2⟩

676 \lst@definelanguage[ibm]{Cobol}[1985]{Cobol}%
677    {morekeywords={ADDRESS,BEGINNING,COMP-3,COMP-4,COMPUTATIONAL,%
678        COMPUTATIONAL-3,COMPUTATIONAL-4,DISPLAY-1,EGCS,EJECT,ENDING,%
679        ENTRY,GOBACK,ID,MORE-LABELS,NULL,NULLS,PASSWORD,RECORDING,%
680        RETURN-CODE,SERVICE,SKIP1,SKIP2,SKIP3,SORT-CONTROL,SORT-RETURN,%
681        SUPPRESS,TITLE,WHEN-COMPILED},%
682    }%

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

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

```
721    REEL,REFERENCES,RELATIVE,RELEASE,REMAINDER,REMOVAL,RENAMES,%
722    REPLACING,REPORT,REPORTING,REPORTS,RERUN,RESERVE,RESET,RETURN,%
723    REVERSED,REWIND,REWRITE,RF,RH,RIGHT,ROUNDED,RUN,SAME,SD,SEARCH,%
724    SECTION,SECURITY,SEGMENT,SEGMENT-LIMIT,SELECT,SEND,SENTENCE,%
725    SEPARATE,SEQUENCE,SEQUENTIAL,SET,SIGN,SIZE,SORT,SORT-MERGE,%
726    SOURCE,SOURCE-COMPUTER,SPACE,SPACES,SPECIAL-NAMES,STANDARD,START,%
727    STATUS,STOP,STRING,SUB-QUEUE-1,SUB-QUEUE-2,SUB-QUEUE-3,SUBTRACT,%
728    SUM,SYMBOLIC,SYNC,SYNCHRONIZED,TABLE,TALLYING,TAPE,TERMINAL,%
729    TERMINATE,TEXT,THAN,THROUGH,THRU,TIME,TIMES,TO,TOP,TRAILING,TYPE,%
730    UNIT,UNSTRING,UNTIL,UP,UPON,USAGE,USE,USING,VALUE,VALUES,VARYING,%
731    WHEN,WITH,WORDS,WORKING-STORAGE,WRITE,ZERO,ZEROES,ZEROS},%
732  alsodigit=-,%
733  sensitive=f,% ???
734  morecomment=[f][commentstyle][6]*,%
735  morestring=[d]"% ??? doubled
736  }[keywords,comments,strings]%
```

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

```
737 ⟨/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.

```
738 ⟨∗lang3⟩

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

748 ⟨/lang3⟩
```

## 2.16   COMMAND.COM Batch Files

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

```
749 ⟨∗lang3⟩

750 \lst@definelanguage[WinXP]{command.com}%
751   {morekeywords={assoc,at,attrib,bootcfg,break,cacls,call,cd,chcp,chdir,%
```

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

772 ⟨/lang3⟩
```

## 2.17 Comsol Multiphysics

Comsol Multiphysics (Prior to version 3.2 known as Femlab) can be used standalone 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.

```
773 ⟨*lang3⟩
774 \lst@definelanguage{Comsol}%
775     {morekeywords={%
776         adaption,arc1,arc2,arrayr,assemble,asseminit,beziercurve2,block2,%
777         block3,bsplinecurve2,bsplinecurve3,bsplinesurf3,bypassplot,cardg,%
778         ccoeffgroup,chamfer,checkgeom,circ1,circ2,coeff2cell,comsol,%
779         cone2,cone3,Contents,createhexes,createprisms,createquads,csgbl2,%
780         csgbl3,csgcmpbz,csgimplbz,csginitaux,csginitnr,csgproputil,%
781         csgrbconv,csgunique3,csguniquep,csgversion,csgvvovl,curve2,%
782         curve3,cylinder2,cylinder3,dat2str,defastget,display,drawgetobj,%
783         drawreobj,drawsetobj,dst,duplicate,dxflayers,dxfread,dxfwrite,%
784         econe2,econe3,eigloop,elcconstr,elcplbnd,elcplextr,elcplproj,%
785         elcplscalar,elempty,elemreobj,eleqc,eleqw,elevate,elgeom,ellip1,%
786         ellip2,ellipsoid2,ellipsoid3,ellipsoidgen_fl23,elmat,elovar,%
787         elpconstr,elshape,elvar,elvarm,embed,extrude,face3,faceprim3,%
788         fastsetop,fem2jxfem,femblocksu,femdiff,femeig,femexport,femgui,%
789         femimport,femiter,femlab,femlin,femmesh,femmeshexp,femnlin,%
790         femplot,femsfun,femsim,femsimlowlevel,femsimserver,femsol,%
791         femsolver,femstate,femstruct,femtime,femwave,festyle,fieldnames,%
```

```
792        fillet,fl1d,fl2d,fl3d,flaction,flafun,flappconvert,flappobj,%
793        flaxisequal,flbase,flbinary,flc1hs,flc2hs,flcanpnt,flcell2draw,%
794        flclear,flcolorbar,flcompact,flconeplot,flcontour2mesh,%
795        flcontour2meshaux,flconvreact,flconvreact1d,flconvreact2d,%
796        flconvreact3d,flcyl,fldc1hs,fldc2hs,fldegree,fldegreer3,%
797        fldegreet3,fldimvarsget,fldisp,fldraw2cell,fldrawnow,fldsmhs,%
798        fldsmsign,flevalmat,flexch,flexchprop,flfastgeom,flform,flgc,%
799        flgcbo,flgdconv,flgeom2cellstr,flgeomadj,flgeomarcize,flgeomec,%
800        flgeomed,flgeomepol,flgeomes,flgeomfc,flgeomfd,flgeomfdp,%
801        flgeomff1,flgeomff2,flgeomfn,flgeomfs,flgeomgetlocalsys,%
802        flgeominit,flgeominitprop,flgeomitransform,flgeomloft,flgeommesh,%
803        flgeomnbs,flgeomnes,flgeomnmr,flgeomnv,flgeompsinv,flgeomrmsing,%
804        flgeomrotp,flgeomsd,flgeomsdim,flgeomse,flgeomsf2,flgeomspm,%
805        flgeomtransform,flgeomud,flgeomvtx,flgetdraw,flheat,flheat1d,%
806        flheat2d,flheat3d,flhelmholtz,flhelmholtz1d,flhelmholtz2d,%
807        flhelmholtz3d,flim2curve,flinterp1,fliscont,flismember,%
808        flisnumeric,fljaction,fllaplace,fllaplace1d,fllaplace2d,%
809        fllaplace3d,flload,flloadfl,flloadmatfile,flloadmfile,%
810        fllobj2cellstr,flmakeevalstr,flmapsoljac,flmat2str,flmatch,%
811        flmesh2spline,flmesh2splineaux,flml65setup,flngdof,flnull,%
812        flnullorth,flpde,flpdeac,flpdec,flpdec1d,flpdec2d,flpdec3d,%
813        flpdedc,flpdedc2d,flpdedc3d,flpdedf,flpdedf1d,flpdedf2d,%
814        flpdedf3d,flpdees,flpdees2d,flpdees3d,flpdeg,flpdeg1d,flpdeg2d,%
815        flpdeg3d,flpdeht,flpdeht1d,flpdeht2d,flpdeht3d,flpdems,flpdems2d,%
816        flpdems3d,flpdens,flpdens2d,flpdens3d,flpdepn,flpdeps,flpdesm3d,%
817        flpdew,flpdew1d,flpdew2d,flpdew3d,flpdewb,flpdewb1d,flpdewb2d,%
818        flpdewb3d,flpdewc,flpdewc1d,flpdewc2d,flpdewc3d,flpdewe,%
819        flpdewe3d,flpdewp,flpdewp2d,flpdewp3d,flplot,flpoisson,%
820        flpoisson1d,flpoisson2d,flpoisson3d,flpric2,flpric3,flreobj,%
821        flreport,flresolvepath,flsave,flschrodinger,flschrodinger1d,%
822        flschrodinger2d,flschrodinger3d,flsde,flsdp,flsdt,flsetalpha,%
823        flsetdraw,flsmhs,flsmsign,flspnull,fltherm_cond1,fltrg,flversion,%
824        flversions,flverver,flwave,flwave1d,flwave2d,flwave3d,%
825        flwriteghist,formstr,gdsread,gencyl2,gencyl3,genextrude,%
826        genextrudeaux,geom,geom0,geom0get,geom1,geom1get,geom2,geom2get,%
827        geom3,geom3get,geom3j2m,geom3m2j,geomaddlblmargin,geomanalyze,%
828        geomarrayr,geomassign,geomcoerce,geomcomp,geomconnect,geomcopy,%
829        geomcsg,geomdel,geomedit,geomexport,geomfile,geomget,%
830        geomgetlabels,geomgetwrkpln,geomimport,geominfo,geominfoaux,%
831        geomlblplot,geomload,geomnumparse,geomobject,geomparse,geomplot,%
832        geomplot1,geomplot2,geomplot3,geomposition,geomproputil,%
833        geomreconstruct,geomreobj,geomserver,geomspline,geomsurf,%
834        geomupdate,get,getfemgeom,getisocurve,getjptr,getmesh,getsdim,%
835        getvmatrixexch,handlesolnumstr,helix1,helix2,helix3,hexahedron2,%
836        hexahedron3,histfrommat,idst,igesread,importplotdata,isempty,%
837        isfield,isfunc,isscript,javaclass,jproputil,jptr2geom,jptrgeom1,%
838        jptrgeom1_fl23,jptrgeom2,jptrgeom2_fl23,jptrgeom3,jptrgeom3_fl23,%
839        keiter,line1,line2,loadobj,loft,matlabinterpdata,mesh2geom,%
840        meshassign,meshcaseadd,meshcasedel,meshcaseutil,meshcheck,%
841        meshembed,meshenrich,meshenrich1,meshenrich2,meshenrich3,%
```

```
842        meshexport,meshextend,meshextrude,meshget,meshimport,meshinit,%
843        meshintegrate,meshmap,meshoptim,meshparse,meshplot,meshplot1,%
844        meshplot2,meshplot3,meshplotproputil,meshpoi,meshproputil,%
845        meshptplot,meshqual,meshrefine,meshrevolve,meshsmooth,%
846        meshsmooth2,meshsweep,meshvolume,minus,mirror,mkreflparams,%
847        mmsolve,modetype,move,moveglobalfields,mphproputil,mtimes,%
848        multiphysics,mypostinterp,notscript,onlyelsconstr,outassign,%
849        paramgeom,pde2draw,pde2equ,pde2fem,pde2geom,pdeblxpd,plus,point1,%
850        point2,point3,poisson,poly1,poly2,postanim,postapplysettings,%
851        postarrow,postarrowbnd,postcolorbar,postcont,postcontdomind,%
852        postcoord,postcopyprop,postcrossplot,postdistrprops,posteval,%
853        postflow,postfnd,postgeomplot,postgetfem,postgetstylecolor,%
854        postglobaleval,postglobalplot,postgp,postinit,postint,postinterp,%
855        postiso,postlin,postmakecontcol,postmax,postmaxmin,postmin,%
856        postmkcontbar,postmknormexpr,postmovie,postnewplot,%
857        postoldmaxminprops,postpd2pm,postplot,postplotconstants,%
858        postpm2pd,postprinc,postprincbnd,postprocgui,postproputil,%
859        postslice,postsurf,posttet,posttitle,print2file,pyramid2,%
860        pyramid3,rect1,rect2,restorefields,revolve,rmfield,rotate,%
861        rotmatrix,scale,serialize,set,setmesh,sh2str,sharg_2_5,shbub,%
862        shdisc,shdiv,shherm,shlag,shvec,simplecoerce,simreobj,slblocks,%
863        solassign,solid0,solid1,solid2,solid3,solidprim3,solproputil,%
864        solsize,solveraddcases,sphere2,sphere3,spiceimport,splineaux,%
865        split,splittoprim,square1,square2,stlread,submode,submodes,%
866        subsasgn,subsref,tangent,taucs,tetrahedron2,tetrahedron3,%
867        tobsplines,torus2,torus3,transform,update,updateassoc,%
868        updateassocinfo,updatefem,updateguistruct,updateobj,vrmlread,%
869        xmeshinfo,xmeshinit},%
870      sensitive=false,%
871      morecomment=[l]\%,%
872      morestring=[m]'%
873    }[keywords,comments,strings]%
874 ⟨/lang3⟩
```

## 2.18   bash, csh, and sh

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

```
875 ⟨*lang1⟩

876 %%
877 %% csh definition (c) 1998 Kai Below
878 %%
879 \lst@definelanguage{csh}
880    {morekeywords={alias,awk,cat,echo,else,end,endif,endsw,exec,exit,%
881        foreach,glob,goto,history,if,logout,nice,nohup,onintr,repeat,sed,%
882        set,setenv,shift,source,switch,then,time,while,umask,unalias,%
883        unset,wait,while,@,env,argv,child,home,ignoreeof,noclobber,%
884        noglob,nomatch,path,prompt,shell,status,verbose,print,printf,%
```

```
885        sqrt,BEGIN,END},%
886    morecomment=[l]\#,%
887    morestring=[d]"%
888    }[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.

```
889 %%
890 %% bash,sh definition (c) 2003 Riccardo Murri <riccardo.murri@gmx.it>
891 %%
892 \lst@definelanguage{bash}[]{sh}%
893    {morekeywords={alias,bg,bind,builtin,caller,command,compgen,compopt,%
894        complete,coproc,declare,disown,dirs,enable,fc,fg,help,history,%
895        jobs,let,local,logout,mapfile,printf,pushd,popd,readarray,select,%
896        set,suspend,shopt,source,times,type,typeset,ulimit,unalias,wait},%
897    }%
898 \lst@definelanguage{sh}%
899    {morekeywords={awk,break,case,cat,cd,continue,do,done,echo,elif,else,%
900        env,esac,eval,exec,exit,export,expr,false,fi,for,function,getopts,%
901        hash,history,if,in,kill,login,newgrp,nice,nohup,ps,pwd,read,%
902        readonly,return,set,sed,shift,test,then,times,trap,true,type,%
903        ulimit,umask,unset,until,wait,while},%
904    morecomment=[l]\#,%
905    morestring=[d]",%
906    morestring=[d]'%
907    }[keywords,comments,strings]%
908 ⟨/lang1⟩
```

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

```
909 ⟨*bash-prf⟩
910 \usepackage[rgb, x11names]{xcolor}
911
912 % common settings
913 \lstset{%
914    frame=tlb,%        the frame is open on the right side
915    resetmargins=false,%
916    rulesepcolor=\color{black},%
917    numbers=left,%                % left
918    numberstyle=\tiny,%
919    numbersep=5pt,%
920    firstnumber=1,%
921    stepnumber=5,%
922    columns=fixed,%               % to prevent inserting spaces
923    fontadjust=true,%
```

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

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

```
951 ⟨/bash-prf⟩
```

## 2.19   Delphi

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

```
952 ⟨*lang2⟩
```

```
953 \lst@definelanguage{Delphi}%
954   {morekeywords={and,as,asm,array,begin,case,class,const,constructor,%
955       destructor,div,do,downto,else,end,except,exports,file,finally,%
956       for,function,goto,if,implementation,in,inherited,inline,%
957       initialization,interface,is,label,library,mod,nil,not,object,of,%
958       or,packed,procedure,program,property,raise,record,repeat,set,%
959       shl,shr,string,then,to,try,type,unit,until,uses,var,while,with,%
960       xor,%
961       absolute,abstract,assembler,at,cdecl,default,dynamic,export,%
962       external,far,forward,index,name,near,nodefault,on,override,%
963       private,protected,public,published,read,resident,storedDir,%
964       virtual,write},%
```

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

## 2.20 Eiffel

Data is from

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

```
1001 ⟨*lang2⟩

1002 \lst@definelanguage{Eiffel}%
1003   {morekeywords={alias,all,and,as,BIT,BOOLEAN,CHARACTER,check,class,%
1004       creation,Current,debug,deferred,do,DOUBLE,else,elseif,end,%
1005       ensure,expanded,export,external,false,feature,from,frozen,if,%
```

```
1006        implies,indexing,infix,inherit,inspect,INTEGER,invariant,is,%
1007        like,local,loop,NONE,not,obsolete,old,once,or,POINTER,prefix,%
1008        REAL,redefine,rename,require,rescue,Result,retry,select,%
1009        separate,STRING,strip,then,true,undefine,unique,until,variant,%
1010        when,xor},%
1011      sensitive,%
1012      morecomment=[l]--,%
1013      morestring=[d]",%
1014    }[keywords,comments,strings]%
```

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

```
1015 ⟨/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.

```
1016 ⟨∗lang3⟩
```

```
1017 \lst@definelanguage{Elan}%
1018    {morekeywords={ABS,AND,BOOL,CAND,CASE,CAT,COLUMNS,CONCR,CONJ,CONST,%
1019        COR,DECR,DEFINES,DET,DIV,DOWNTO,ELIF,ELSE,END,ENDIF,ENDOP,%
1020        ENDPACKET,ENDPROC,ENDREP,ENDSELECT,FALSE,FI,FILE,FOR,FROM,IF,%
1021        INCR,INT,INV,LEAVE,LENGTH,LET,MOD,NOT,OF,OP,OR,OTHERWISE,PACKET,%
1022        PROC,REAL,REP,REPEAT,ROW,ROWS,SELECT,SIGN,STRUCT,SUB,TEXT,THEN,%
1023        TRANSP,TRUE,TYPE,UNTIL,UPTO,VAR,WHILE,WITH,XOR,%
1024        maxint,sign,abs,min,max,random,initializerandom,subtext,code,%
1025        replace,text,laenge,pos,compress,change,maxreal,smallreal,floor,%
1026        pi,e,ln,log2,log10,sqrt,exp,tan,tand,sin,sind,cos,cosd,arctan,%
1027        arctand,int,real,lastconversionok,put,putline,line,page,get,%
1028        getline,input,output,sequentialfile,maxlinelaenge,reset,eof,%
1029        close,complexzero,complexone,complexi,complex,realpart,imagpart,%
1030        dphi,phi,vector,norm,replace,matrix,idn,row,column,sub,%
1031        replacerow,replacecolumn,replaceelement,transp,errorsstop,stop},%
1032      sensitive,%
1033      morestring=[d]"%
1034    }[keywords,strings]%
```

```
1035 ⟨/lang3⟩
```

## 2.22   Erlang

Thanks to Daniel Gazard.

```
1036 ⟨∗lang3⟩
```

```
1037 %%
1038 %% Erlang definition (c) 2003 Daniel Gazard
```

```
1039 %%
1040 \lst@definelanguage{erlang}%
1041   {morekeywords={abs,after,and,apply,atom,atom_to_list,band,binary,%
1042       binary_to_list,binary_to_term,bor,bsl,bsr,bxor,case,catch,%
1043       date,div,element,erase,end,exit,export,float,float_to_list,%
1044       get,halt,hash,hd,if,info,import,integer,integer_to_list,%
1045       length,link,list,list_to_atom,list_to_float,list_to_integer,%
1046       list_to_tuple,module,node,nodes,now,of,or,pid,port,ports,%
1047       processes,put,receive,reference,register,registered,rem,%
1048       round,self,setelement,size,spawn,throw,time,tl,trace,trunc,%
1049       tuple,tuple_to_list,unlink,unregister,whereis,error,false,%
1050       infinity,nil,ok,true,undefined,when},%
1051   otherkeywords={->,!,[,],\{,\}},%
1052   morecomment=[l]\%,%
1053   morestring=[b]",%
1054   morestring=[b]'%
1055   }[keywords,comments,strings]%
1056 ⟨/lang3⟩
```

## 2.23   Euphoria

Detlef Reimers sent me the language definition.

```
1057 ⟨∗lang2⟩

1058 %%
1059 %% Euphoria definition (c) 1998 Detlef Reimers
1060 %%
1061 \lst@definelanguage{Euphoria}%
1062 % for Euphoria 2.0, Rapid Deployment Software, Kanada
1063   {morekeywords={abort,and,and_bits,append,arctan,atom,by,call,%
1064       call_proc,call_func,c_proc,c_func,clear_screen,close,%
1065       command_line,compare,constant,cos,do,date,else,elsif,end,exit,%
1066       find,floor,for,function,getc,getenv,get_key,gets,global,%
1067       get_pixel,if,include,integer,length,log,match,machine_func,%
1068       machine_proc,mem_copy,mem_set,not,not_bits,or,object,open,%
1069       or_bits,procedure,puts,position,prepend,print,printf,power,peek,%
1070       poke,pixel,poke4,peek4s,peek4u,return,rand,repeat,remainder,%
1071       routine_id,sequence,sqrt,sin,system,sprintf,then,type,to,time,%
1072       trace,tan,while,with,without,xor,xor_bits},%
1073   sensitive,%
1074   morecomment=[l]--,%
1075   morestring=[d]',%
1076   morestring=[d]"%
1077   }[keywords,comments,strings]%
1078 ⟨/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.

1079 ⟨∗lang1⟩

The current version of Fortran (Fortran 2008) 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`.

```
1080 \lst@definelanguage[08]{Fortran}[03]{Fortran}{%
1081    morekeywords={ALL, BLOCK, CODIMENSION, CONCURRENT, CONTIGUOUS, CRITICAL,%
1082      ERROR, LOCK, SUBMODULE, SYNC, UNLOCK},%
```

New procedures in Fortran 2008:

```
1083      morekeywords=[3]{ACOSH,ASINH,ATANH,ATOMIC_DEFINE,ATOMIC_REF,BESSEL_J0,%
1084        BESSEL_J1,BESSEL_JN,BESSEL_Y0,BESSEL_Y1,BESSEL_YN,BGE,BGT,BLE,BLT,%
1085        C_SIZEOF,COMPILER_OPTIONS,COMPILER_VERSION,DSHIFTL,DSHIFTR,ERF,ERFC,%
1086        ERFC_SCALED,EXECUTE_COMMAND_LINE,GAMMA,HYPOT,IALL,IANY,IMAGE_INDEX,%
1087        IPARITY,LCOBOUND,LEADZ,LOG_GAMMA,MASKL,MASKR,MERGE_BITS,NORM2,%
1088        NUM_IMAGES,PARITY,POPCNT,POPPAR,SHIFTA,SHIFTL,SHIFTR,STORAGE_SIZE,%
1089        THIS_IMAGE,TRAILZ,UCOBOUND}%
1090 }%
```

Fortran 2003 introduces the following keywords:

```
1091 \lst@definelanguage[03]{Fortran}[95]{Fortran}{%
1092    morekeywords={ABSTRACT, ASSOCIATE, ASYNCHRONOUS, BIND, CLASS, DEFERRED,%
1093      ENUM, ENUMERATOR, EXTENDS, FINAL, FLUSH, GENERIC, IMPORT,%
1094      NON_OVERRIDABLE, NOPASS, PASS, PROTECTED, VALUE, VOLATILE, WAIT},%
```

These are new options/specifiers:

```
1095      morekeywords=[2]{DECIMAL,ENCODING,IOMSG,ROUND},
```

And also some new procedures:

```
1096      morekeywords=[3]{C_ASSOCIATED,C_F_POINTER,C_F_PROCPOINTER,C_FUNLOC,%
1097      C_LOC,COMMAND_ARGUMENT_COUNT,EXTENDS_TYPE_OF,GET_COMMAND,GET_COMMAND_ARGUMENT,%
1098      GET_ENVIRONMENT_VARIABLE,IS_IOSTAT_END,MOVE_ALLOC,NEW_LINE,SAME_TYPE_AS,%
1099      SELECTED_CHAR_KIND}%
1100 }%
```

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

```
1101 \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.

```
1102 \lst@definelanguage[95]{Fortran}[77]{Fortran}%
```

```
1103    {deletekeywords=SAVE,%
1104     morekeywords={ALLOCATABLE,ALLOCATE,ASSIGNMENT,CASE,%
1105         CONTAINS,CYCLE,DEALLOCATE,DEFAULT,EXIT,INCLUDE,IN,NONE,%
1106         OUT,INTENT,INTERFACE,MODULE,NAMELIST,%
1107         NULLIFY,ONLY,OPERATOR,OPTIONAL,OUT,POINTER,PRIVATE,%
1108         PUBLIC,RECURSIVE,RESULT,SELECT,SEQUENCE,%
1109         TARGET,USE,WHERE,WHILE,BLOCKDATA,DOUBLEPRECISION,%
1110         ENDBLOCKDATA,ENDFILE,ENDFUNCTION,ENDINTERFACE,%
1111         ENDMODULE,ENDPROGRAM,ENDSELECT,ENDSUBROUTINE,ENDTYPE,ENDWHERE,%
1112         INOUT,SELECTCASE,%
```

Theses keys were missing from the 1.4 version of listings:

```
1113         ELEMENTAL, ELSEWHERE, FORALL, PURE,%
```

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

```
1114         PROCEDURE},%
```

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

```
1115         morekeywords=[2]{ACTION,ADVANCE,DELIM,IOLENGTH,LEN,NAME,%
1116         NML,PAD,POSITION,READWRITE,SIZE,STAT},% corrected NML from NMT
```

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

```
1117         morekeywords=[3]{ACHAR,ADJUSTL,ADJUSTR,ALL,ALLOCATED,ANY,ASSOCIATED,%
1118         BIT_SIZE,%
1119         BTEST,CEILING,COUNT,CPU_TIME,CSHIFT,DATE_AND_TIME,DIGITS,DOT_PRODUCT,%
1120         EOSHIFT,EPSILON,EXPONENT,FLOOR,FRACTION,HUGE,IACHAR,IAND,IBCLR,
1121         IBITS,IBSET,ICHAR,IEOR,IOR,ISHFT,ISHFTC,KIND,LBOUND,LEN_TRIM,% left out LOGICAL
1122         MATMUL,MAXEXPONENT,MAXLOC,MAXVAL,MERGE,MINEXPONENT,MINLOC,MINVAL,%
1123         MODULO,MVBITS,NEAREST,NOT,NULL,PACK,PRECISION,PRESENT,PRODUCT,%
1124         RADIX,RANDOM_NUMBER,RANDOM_SEED,RANGE,RANK,REPEAT,RESHAPE,RRSPACING,%
1125         SCALE,SCAN,SELECTED_INT_KIND,SELECTED_REAL_KIND,SET_EXPONENT,SHAPE,%
1126         SINH,SIZE,SPACING,SPREAD,SUM,SYSTEM_CLOCK,TINY,TRANSFER,TRANSPOSE,%
1127         TRIM,UBOUND,UNPACK,VERIFY},%
1128     deletecomment=[f],% no fixed comment line: 1998 Magne Rudshaug
1129     morecomment=[l]!%
1130     }%
```

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').

```
1131 \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.

```
1132    {morekeywords={ASSIGN,BACKSPACE,CALL,CHARACTER,%
1133         CLOSE,COMMON,COMPLEX,CONTINUE,DATA,DIMENSION,DO,DOUBLE,%
1134         ELSE,ELSEIF,END,ENDIF,ENDDO,ENTRY,EQUIVALENCE,EXTERNAL,%
1135         FILE,FORMAT,FUNCTION,GO,TO,GOTO,IF,IMPLICIT,%
1136         INQUIRE,INTEGER,INTRINSIC,LOGICAL,%
1137         OPEN,PARAMETER,PAUSE,PRECISION,PRINT,PROGRAM,READ,REAL,%
1138         RETURN,REWIND,STOP,SUBROUTINE,THEN,%
```

```
1139          WRITE,SAVE},%
1140      morekeywords=[2]{ACCESS,BLANK,BLOCK,DIRECT,EOF,ERR,EXIST,%
1141          FMT,FORM,FORMATTED,IOSTAT,NAMED,NEXTREC,NUMBER,OPENED,%
1142          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!)

```
1143      morekeywords=[3]{INT,DBLE,CMPLX,ICHAR,CHAR,AINT,ANINT,% left out real
1144          NINT,ABS,MOD,SIGN,DIM,DPROD,MAX,MIN,AIMAG,CONJG,SQRT,%
1145          EXP,LOG,LOG10,SIN,COS,TAN,ASIN,ACOS,ATAN,ATAN2,SINH,%
1146          COSH,TANH,LGE,LGT,LLE,LLT,LEN,INDEX},%
```

And here is the last list: fortran operators:

```
1147      morekeywords=[4]{AND,EQ,EQV,FALSE,GE,GT,OR,LE,LT,NE,NEQV,NOT,TRUE},%
1148      sensitive=f,%% not Fortran-77 standard, but allowed in Fortran-95 %%
1149      morecomment=[f]*,%
1150      morecomment=[f]C,%
1151      morecomment=[f]c,%
1152      morestring=[d]",%% not Fortran-77 standard, but allowed in Fortran-95 %%
1153      morestring=[d]'%
1154    }[keywords,comments,strings]%
```

1155 ⟨/lang1⟩

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

1156 ⟨∗fortran-prf⟩

```
1157 \usepackage[rgb, x11names]{xcolor}
1158
1159 % common settings
1160 \lstset{%
1161   frame=tlb,%        the frame is open on the right side
1162   resetmargins=false,%
1163   rulesepcolor=\color{black},%
1164   numbers=left,%               % left
1165   numberstyle=\tiny,%
1166   numbersep=5pt,%
1167   firstnumber=1,%
1168   stepnumber=5,%
1169   columns=fixed,%              % to prevent inserting spaces
1170   fontadjust=true,%
1171   keepspaces=true,%
1172   basewidth=0.5em,%
1173   captionpos=t,%
1174   abovecaptionskip=\smallskipamount,% same amount as default
1175   belowcaptionskip=\smallskipamount,% in caption package
1176 }
1177 % settings for colored printing
1178 \lstdefinestyle{fortran}{%
1179   backgroundcolor=\color{yellow!10},%
1180   basicstyle=\small\ttfamily,%
1181   identifierstyle=\color{black},%
```

32

```
1182   keywordstyle=\color{blue},%
1183   keywordstyle={[2]\color{cyan}},%
1184   keywordstyle={[3]\color{olive}},%
1185   stringstyle=\color{teal},%
1186   commentstyle=\itshape\color{orange},%
1187 }%
1188 % settings for back and white printing
1189 \lstdefinestyle{fortranbw}{%
1190   backgroundcolor={},%
1191   basicstyle=\small\ttfamily,%
1192   identifierstyle={},%
1193   keywordstyle=\bfseries,%
1194   stringstyle=\itshape,%
1195   commentstyle=\slshape,%
1196   rulesepcolor=\color{black},%
1197 }%
```

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

```
1198 ⟨/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.

```
1199 ⟨*lang2⟩

1200 %%
1201 %% GAP definition
1202 %% (c) 2013 Heiko Oberdiek
1203 %%
1204 \lst@definelanguage{GAP}{%
1205   morekeywords={%
1206     Assert,Info,IsBound,QUIT,%
1207     TryNextMethod,Unbind,and,break,%
1208     continue,do,elif,%
1209     else,end,false,fi,for,%
1210     function,if,in,local,%
1211     mod,not,od,or,%
1212     quit,rec,repeat,return,%
1213     then,true,until,while%
1214   },%
1215   sensitive,%
1216   morecomment=[l]\#,%
1217   morestring=[b]",%
1218   morestring=[b]',%
1219 }[keywords,comments,strings]

1220 ⟨/lang2⟩
```

## 2.26 Go—Groups, Algorithms, Programming

From [https://en.wikipedia.org/wiki/Go_(programming_language)](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.

```
1221 ⟨*lang3⟩

1222 %%
1223 %% Go definition
1224 %% (c) 2018 Christian Maurer
1225 %%
1226 \lst@definelanguage{Go}{%
1227   morekeywords={append,bool,break,byte,cap,case,chan,close,complex,%
1228     complex128,complex64,const,continue,copy,default,defer,delete,%
1229     else,error,fallthrough,false,float32,float64,for,func,go,goto,%
1230     if,imag,import,int,int16,int32,int64,int8,interface,iota,len,%
1231     make,map,new,nil,package,panic,print,println,range,real,%
1232     recover,return,rune,select,string,struct,switch,true,type,%
1233     uint,uint16,uint32,uint64,uint8,uintptr,var},%
1234   sensitive,%
1235   morecomment=[s]{/*}{*/},%
1236   morecomment=[l]//,%
1237   morestring=[b]',%
1238   morestring=[b]",%
1239   morestring=[s]{'}{'},%
1240 }[keywords,comments,strings]%

1241 ⟨/lang3⟩
```

## 2.27 Guarded Command Language (GCL)

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

```
1242 ⟨*lang2⟩

1243 %%
1244 %% Guarded Command Language (GCL)  definition
1245 %% (c) 2002 Mark van Eijk
1246 %%
1247 \lst@definelanguage{GCL}%
1248   {morekeywords={const,con,var,array,of,skip,if,fi,do,od,div,mod},%
1249    literate={|[}{\ensuremath{|\hskip -0.1em[}}2%
1250            {]|}{\ensuremath{]\hskip -0.1em|}}2%
1251     {[]}{\ensuremath{[\hskip -0.1em]}}2%
1252     {->}{\ensuremath{\rightarrow}~}2%
1253     {==}{\ensuremath{\equiv}~}2%
1254     {>=}{\ensuremath{\geq}~}2%
1255     {<=}{\ensuremath{\leq}~}2%
```

```
1256      {/\\}{\ensuremath{\land}~}2%
1257      {\\/}{\ensuremath{\lor}~}2%
1258      {!}{\ensuremath{\lnot}}1%
1259      {!=}{\ensuremath{\neq}~}2%
1260      {max}{\ensuremath{\uparrow}}1%
1261      {min}{\ensuremath{\downarrow}}1,%
1262    sensitive=f,%
1263    morecomment=[s]{\{}{\}},%
1264    morestring=[d]'%
1265  }[keywords,comments,strings]%
```

1266 ⟨/lang2⟩

## 2.28   Gnuplot

Thanks to Dr. Christoph Giess for providing this definition.

1267 ⟨*lang2⟩

```
1268 %%
1269 %% gnuplot definition (c) Christoph Giess
1270 %%
1271 \lst@definelanguage{Gnuplot}%
1272   {keywords={abs,acos,acosh,arg,asin,asinh,atan,atan2,atanh,besj0,%
1273        besj1,besy0,besy1,ceil,cos,cosh,erf,erfc,exp,floor,gamma,ibeta,%
1274        inverf,igamma,imag,invnorm,int,lgamma,log,log10,norm,rand,real,%
1275        sgn,sin,sinh,sqrt,tan,tanh,column,tm_hour,tm_mday,tm_min,tm_mon,%
1276        tm_sec,tm_wday,tm_yday,tm_year,valid,cd,call,clear,exit,fit,%
1277        help,if,load,pause,plot,print,pwd,quit,replot,reread,reset,save,%
1278        set,show,shell,splot,test,update,angles,arrow,autoscale,border,%
1279        boxwidth,clabel,clip,cntrparam,contour,data,dgrid3d,dummy,%
1280        format,function,functions,grid,hidden3d,isosamples,key,keytitle,%
1281        label,logscale,mapping,offsets,output,parametric,pointsize,%
1282        polar,rrange,samples,size,style,surface,terminal,tics,time,%
1283        timefmt,title,trange,urange,variables,view,vrange,xdata,xlabel,%
1284        xmargin,xrange,xtics,mxtics,mytics,xdtics,xmtics,xzeroaxis,%
1285        ydata,ylabel,yrange,ytics,ydtics,ymtics,yzeroaxis,zdata,zero,%
1286        zeroaxis,zlabel,zrange,ztics,zdtics,zmtics,timefm,using,title,%
1287        with,index,every,thru,smooth},%
1288    sensitive,%
1289    comment=[l]\#,%
1290    morestring=[b]",%
1291    morestring=[b]',%
1292  }[keywords,comments,strings]%
```

1293 ⟨/lang2⟩

## 2.29   Hansl/Gretl

Thanks to Ignacio Díaz-Emparanza for providing the definition of hansl. Hansl is the gretl scripting language (see http://gretl.sourceforge.net).

1294 ⟨*lang2⟩

```
1295 %%
1296 %% http://gretl.sourceforge.net/gretl-help/cmdref.html
1297 %% (c) 2013 Ignacio D\'iaz-Emparanza
1298 %%
1299 \lst@definelanguage{hansl}{%
1300   % $-variables are internal functions in hansl
1301   keywordsprefix ={\$},
1302   morekeywords={ % hansl commands:
1303     add,adf,anova,append,ar,ar1,%
1304     arbond,arch,arima,biprobit,boxplot,break,%
1305     catch,chow,clear,coeffsum,coint,coint2,%
1306     corr,corrgm,cusum,data,dataset,debug,%
1307     delete,diff,difftest,discrete,dpanel,dummify,%
1308     duration,elif,else,end,endif,endloop,%
1309     eqnprint,equation,estimate,fcast,foreign,fractint,%
1310     freq,function,garch,genr,gmm,gnuplot,%
1311     graphpg,hausman,heckit,help,hsk,hurst,%
1312     if,include,info,intreg,join,kalman,%
1313     kpss,labels,lad,lags,ldiff,leverage,%
1314     levinlin,logistic,logit,logs,loop,mahal,%
1315     makepkg,markers,meantest,mle,modeltab,modprint,%
1316     modtest,mpols,negbin,nls,normtest,nulldata,%
1317     ols,omit,open,orthdev,outfile,panel,%
1318     pca,pergm,poisson,print,printf,probit,%
1319     pvalue,qlrtest,qqplot,quantreg,quit,rename,%
1320     reset,restrict,rmplot,run,runs,scatters,%
1321     sdiff,set,setinfo,setobs,setmiss,shell,%
1322     smpl,spearman,sprintf,square,sscanf,store,%
1323     summary,system,tabprint,textplot,tobit,tsls,%
1324     var,varlist,vartest,vecm,vif,wls,%
1325     xcorrgm,xtab,scalar,series,matrix,string},%
1326   morekeywords=[2]{ %  Functions
1327     abs,acos,acosh,aggregate,argname,%
1328     asin,asinh,atan,atanh,atof,%
1329     bessel,BFGSmax,bkfilt,boxcox,bwfilt,%
1330     cdemean,cdf,cdiv,ceil,cholesky,%
1331     chowlin,cmult,cnorm,colname,colnames,%
1332     cols,corr,corrgm,cos,cosh,%
1333     cov,critical,cum,deseas,det,%
1334     diag,diagcat,diff,digamma,dnorm,%
1335     dsort,dummify,eigengen,eigensym,eigsolve,%
1336     epochday,errmsg,exp,fcstats,fdjac,%
1337     fft,ffti,filter,firstobs,fixname,%
1338     floor,fracdiff,gammafun,getenv,getline,%
1339     ghk,gini,ginv,halton,hdprod,%
1340     hpfilt,I,imaxc,imaxr,imhof,%
1341     iminc,iminr,inbundle,infnorm,inlist,%
1342     int,inv,invcdf,invmills,invpd,%
1343     irf,irr,isconst,isnan,isnull,%
1344     isodate,iwishart,kdensity,kfilter,ksimul,%
```

```
1345     ksmooth,kurtosis,lags,lastobs,ldet,%
1346     ldiff,lincomb,ljungbox,lngamma,log,%
1347     log10,log2,loess,logistic,lower,%
1348     lrvar,max,maxc,maxr,mcorr,%
1349     mcov,mcovg,mean,meanc,meanr,%
1350     median,mexp,min,minc,minr,%
1351     missing,misszero,mlag,mnormal,mols,%
1352     monthlen,movavg,mpols,mrandgen,mread,%
1353     mreverse,mrls,mshape,msortby,muniform,%
1354     mwrite,mxtab,nadarwat,nelem,ngetenv,%
1355     nobs,normal,npv,NRmax,nullspace,%
1356     obs,obslabel,obsnum,ok,onenorm,%
1357     ones,orthdev,pdf,pergm,pmax,%
1358     pmean,pmin,pnobs,polroots,polyfit,%
1359     princomp,prodc,prodr,psd,psdroot,%
1360     pshrink,psum,pvalue,pxsum,qform,%
1361     qnorm,qrdecomp,quadtable,quantile,randgen,%
1362     randgen1,randint,rank,ranking,rcond,%
1363     readfile,regsub,remove,replace,resample,%
1364     round,rownames,rows,sd,sdc,%
1365     sdiff,selifc,selifr,seq,setnote,%
1366     simann,sin,sinh,skewness,sort,%
1367     sortby,sqrt,sscanf,sst,strlen,%
1368     strncmp,strsplit,strstr,strstrip,strsub,%
1369     sum,sumall,sumc,sumr,svd,%
1370     tan,tanh,toepsolv,tolower,toupper,%
1371     tr,transp,trimr,typestr,uniform,%
1372     uniq,unvech,upper,urcpval,values,%
1373     var,varname,varnum,varsimul,vec,%
1374     vech,weekday,wmean,wsd,wvar,%
1375     xmax,xmin,xpx,zeromiss,zeros,%
1376   },%
1377   sensitive=t,%
1378   morecomment=[l]{\#},%
1379   morecomment=[s]{/*}{*/},%
1380   morestring=[b]{"}}%
1381 \lstalias{gretl}{hansl}
1382 ⟨/lang2⟩
```

## 2.30   Haskell

Thanks to Peter Bartke for providing the new definition.

```
1383 ⟨*lang2⟩
1384 %%
1385 %% Haskell98 as implemented in Hugs98. See http://www.haskell.org
1386 %% All keywords from Prelude and Standard Libraries
1387 %% (c) 1999 Peter Bartke
1388 %%
```

```
1389 \lst@definelanguage{Haskell}%
1390   {otherkeywords={=>},%
1391    morekeywords={abstype,if,then,else,case,class,data,default,deriving,%
1392        hiding,if,in,infix,infixl,infixr,import,instance,let,module,%
1393        newtype,of,qualified,type,where,do,AbsoluteSeek,AppendMode,%
1394        Array,BlockBuffering,Bool,BufferMode,Char,Complex,Double,Either,%
1395        FilePath,Float,Int,Integer,IO,IOError,Ix,LineBuffering,Maybe,%
1396        Ordering,NoBuffering,ReadMode,ReadWriteMode,ReadS,RelativeSeek,%
1397        SeekFromEnd,SeekMode,ShowS,StdGen,String,Void,Bounded,Enum,Eq,%
1398        Eval,ExitCode,exitFailure,exitSuccess,Floating,Fractional,%
1399        Functor,Handle,HandlePosn,IOMode,Integral,List,Monad,MonadPlus,%
1400        MonadZero,Num,Numeric,Ord,Random,RandomGen,Ratio,Rational,Read,%
1401        Real,RealFloat,RealFrac,Show,System,Prelude,EQ,False,GT,Just,%
1402        Left,LT,Nothing,Right,WriteMode,True,abs,accum,accumArray,%
1403        accumulate,acos,acosh,all,and,any,ap,appendFile,applyM,%
1404        approxRational,array,asTypeOf,asin,asinh,assocs,atan,atan2,atanh,%
1405        bounds,bracket,bracket_,break,catch,catMaybes,ceiling,chr,cis,%
1406        compare,concat,concatMap,conjugate,const,cos,cosh,curry,cycle,%
1407        decodeFloat,delete,deleteBy,deleteFirstsBy,denominator,%
1408        digitToInt,div,divMod,drop,dropWhile,either,elem,elems,elemIndex,%
1409        elemIndices,encodeFloat,enumFrom,enumFromThen,enumFromThenTo,%
1410        enumFromTo,error,even,exitFailure,exitWith,exp,exponent,fail,%
1411        filter,filterM,find,findIndex,findIndices,flip,floatDigits,%
1412        floatRadix,floatRange,floatToDigits,floor,foldl,foldM,foldl1,%
1413        foldr,foldr1,fromDouble,fromEnum,fromInt,fromInteger,%
1414        fromIntegral,fromJust,fromMaybe,fromRat,fromRational,%
1415        fromRealFrac,fst,gcd,genericLength,genericTake,genericDrop,%
1416        genericSplitAt,genericIndex,genericReplicate,getArgs,getChar,%
1417        getContents,getEnv,getLine,getProgName,getStdGen,getStdRandom,%
1418        group,groupBy,guard,hClose,hFileSize,hFlush,hGetBuffering,%
1419        hGetChar,hGetContents,hGetLine,hGetPosn,hIsClosed,hIsEOF,hIsOpen,%
1420        hIsReadable,hIsSeekable,hIsWritable,hLookAhead,hPutChar,hPutStr,%
1421        hPutStrLn,hPrint,hReady,hSeek,hSetBuffering,hSetPosn,head,%
1422        hugsIsEOF,hugsHIsEOF,hugsIsSearchErr,hugsIsNameErr,%
1423        hugsIsWriteErr,id,ioError,imagPart,index,indices,init,inits,%
1424        inRange,insert,insertBy,interact,intersect,intersectBy,%
1425        intersperse,intToDigit,ioeGetErrorString,ioeGetFileName,%
1426        ioeGetHandle,isAlreadyExistsError,isAlreadyInUseError,isAlpha,%
1427        isAlphaNum,isAscii,isControl,isDenormalized,isDoesNotExistError,%
1428        isDigit,isEOF,isEOFError,isFullError,isHexDigit,isIEEE,%
1429        isIllegalOperation,isInfinite,isJust,isLower,isNaN,%
1430        isNegativeZero,isNothing,isOctDigit,isPermissionError,isPrefixOf,%
1431        isPrint,isSpace,isSuffixOf,isUpper,isUserError,iterate,ixmap,%
1432        join,last,lcm,length,lex,lexDigits,lexLitChar,liftM,liftM2,%
1433        liftM3,liftM4,liftM5,lines,listArray,listToMaybe,log,logBase,%
1434        lookup,magnitude,makePolar,map,mapAccumL,mapAccumR,mapAndUnzipM,%
1435        mapM,mapM_,mapMaybe,max,maxBound,maximum,maximumBy,maybe,%
1436        maybeToList,min,minBound,minimum,minimumBy,mkPolar,mkStdGen,%
1437        mplus,mod,msum,mzero,negate,next,newStdGen,not,notElem,nub,nubBy,%
1438        null,numerator,odd,openFile,or,ord,otherwise,partition,phase,pi,%
```

```
1439        polar,pred,print,product,properFraction,putChar,putStr,putStrLn,%
1440        quot,quotRem,random,randomIO,randomR,randomRIO,randomRs,randoms,%
1441        rangeSize,read,readDec,readFile,readFloat,readHex,readInt,readIO,%
1442        readList,readLitChar,readLn,readParen,readOct,readSigned,reads,%
1443        readsPrec,realPart,realToFrac,recip,rem,repeat,replicate,return,%
1444        reverse,round,scaleFloat,scanl,scanl1,scanr,scanr1,seq,sequence,%
1445        sequence_,setStdGen,show,showChar,showEFloat,showFFloat,%
1446        showFloat,showGFloat,showInt,showList,showLitChar,showParen,%
1447        showSigned,showString,shows,showsPrec,significand,signum,sin,%
1448        sinh,snd,sort,sortBy,span,split,splitAt,sqrt,stderr,stdin,stdout,%
1449        strict,subtract,succ,sum,system,tail,tails,take,takeWhile,tan,%
1450        tanh,toEnum,toInt,toInteger,toLower,toRational,toUpper,transpose,%
1451        truncate,try,uncurry,undefined,unfoldr,union,unionBy,unless,%
1452        unlines,until,unwords,unzip,unzip3,unzip4,unzip5,unzip6,unzip7,%
1453        userError,when,words,writeFile,zero,zip,zip3,zip4,zip5,zip6,zip7,%
1454        zipWith,zipWithM,zipWithM_,zipWith3,zipWith4,zipWith5,zipWith6,%
1455        zipWith7},%
1456     sensitive,%
1457     morecomment=[l]--,%
1458     morecomment=[n]{\{-}{-\}},%
1459     morestring=[b]"%
1460     }[keywords,comments,strings]%
```

1461 ⟨/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.

1462 ⟨∗lang1⟩

```
1463 \lst@definelanguage{HTML}%
1464    {morekeywords={A,ABBR,ACRONYM,ADDRESS,APPLET,AREA,B,BASE,BASEFONT,%
1465        BDO,BIG,BLOCKQUOTE,BODY,BR,BUTTON,CAPTION,CENTER,CITE,CODE,COL,%
1466        COLGROUP,DD,DEL,DFN,DIR,DIV,DL,DOCTYPE,DT,EM,FIELDSET,FONT,FORM,%
1467        FRAME,FRAMESET,HEAD,HR,H1,H2,H3,H4,H5,H6,HTML,I,IFRAME,IMG,INPUT,%
1468        INS,ISINDEX,KBD,LABEL,LEGEND,LH,LI,LINK,LISTING,MAP,META,MENU,%
1469        NOFRAMES,NOSCRIPT,OBJECT,OPTGROUP,OPTION,P,PARAM,PLAINTEXT,PRE,%
1470        OL,Q,S,SAMP,SCRIPT,SELECT,SMALL,SPAN,STRIKE,STRING,STRONG,STYLE,%
1471        SUB,SUP,TABLE,TBODY,TD,TEXTAREA,TFOOT,TH,THEAD,TITLE,TR,TT,U,UL,%
1472        VAR,XMP,%
1473        accesskey,action,align,alink,alt,archive,axis,background,bgcolor,%
1474        border,cellpadding,cellspacing,charset,checked,cite,class,classid,%
1475        code,codebase,codetype,color,cols,colspan,content,coords,data,%
1476        datetime,defer,disabled,dir,event,error,for,frameborder,headers,%
1477        height,href,hreflang,hspace,http-equiv,id,ismap,label,lang,link,%
1478        longdesc,marginwidth,marginheight,maxlength,media,method,multiple,%
1479        name,nohref,noresize,noshade,nowrap,onblur,onchange,onclick,%
1480        ondblclick,onfocus,onkeydown,onkeypress,onkeyup,onload,onmousedown,%
1481        profile,readonly,onmousemove,onmouseout,onmouseover,onmouseup,%
```

```
1482        onselect,onunload,rel,rev,rows,rowspan,scheme,scope,scrolling,%
1483        selected,shape,size,src,standby,style,tabindex,text,title,type,%
1484        units,usemap,valign,value,valuetype,vlink,vspace,width,xmlns},%
1485    tag=**[s]<>,%
1486    sensitive=f,%
1487    morestring=[d]",% ??? doubled
```

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

```
1488    MoreSelectCharTable=%
1489        \lst@CArgX--\relax\lst@DefDelimB{}{}%
1490            {\ifnum\lst@mode=\lst@tagmode\else
1491                \expandafter\@gobblethree
1492             \fi}%
1493            \lst@BeginComment\lst@commentmode{{\lst@commentstyle}}%
1494        \lst@CArgX--\relax\lst@DefDelimE{}{}{}%
1495            \lst@EndComment\lst@commentmode
1496  }[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.

```
1497 ⟨/lang1⟩
```

## 2.32   IDL

The definition is from Jürgen Heim.

```
1498 ⟨∗lang2⟩

1499 %%
1500 %% IDL definition (c) 1998 Juergen Heim
1501 %%
1502 \lst@definelanguage{IDL}%
1503   {morekeywords={and,begin,case,common,do,else,end,endcase,endelse,%
1504       endfor,endif,endrep,endwhile,eq,for,function,ge,goto,gt,if,le,lt,%
1505       mod,ne,not,of,on_ioerror,or,pro,repeat,return,then,until,while,%
1506       xor,on_error,openw,openr,openu,print,printf,printu,plot,read,%
1507       readf,readu,writeu,stop},%
1508   sensitive=f,%
1509   morecomment=[l];,%
1510   morestring=[d]'%
1511   }[keywords,comments,strings]%

1512 ⟨/lang2⟩
```

## 2.33   Inform

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

```
1513 ⟨∗lang2⟩
```

```
1514 %%
1515 %% Inform definition (c) 2003 Jonathan Sauer
1516 %%
1517 \lst@definelanguage{inform}{%
1518     % Language keywords
1519     morekeywords={breakdo,else,false,for,has,hasnt,if,%
1520                 in,indirect,jump,notin,nothing,NULL,objectloop,ofclass,%
1521                 private,property,provides,return,rfalse,rtrue,self,string,%
1522                 switch,to,true,until,while,with,%
1523                 creature,held,multiexcept,multiheld,multiinside,noun,number,%
1524                 scope,topic},%
1525     %
1526     % Inform functions
1527     morekeywords=[2]{box,child,children,font,give,inversion,metaclass,move,%
1528                 new_line,parent,print,print_ret,read,remove,restore,sibling,%
1529                 save,spaces,quit,style,bold,underline,reverse,roman remaining,%
1530                 create,destroy,recreate,copy},%
1531     %
1532     % Inform definitions
1533     morekeywords=[3]{Attribute,Array,Class,Constant,Default,End,Endif,Extend,%
1534                 Global,Ifdef,Iffalse,Ifndef,Ifnot,Iftrue,Include,Object,%
1535                 Property,Verb,Release,Serial,Statusline},%
1536     %
1537     % Library attributes
1538     morekeywords=[4]{absent,animate,clothing,concealed,container,door,edible,%
1539                 enterable,female,general,light,lockable locked,male,moved,%
1540                 neuter,on,open,openable,pluralname,proper,scenery,scored,%
1541                 static,supporter,switchable,talkable,transparent,visited,%
1542                 workflag,worn},%
1543     %
1544     % Library properties
1545     morekeywords=[5]{n_to,s_to,e_to,w_to,ne_to,nw_to,se_to,sw_to,in_to,%
1546                 out_to,u_to,d_to,add_to_scope,after,article,articles,before,%
1547                 cant_go,capacity,daemon,describe,description,door_dir,door_to,%
1548                 each_turn,found_in,grammar,initial,inside_description,invent,%
1549                 life,list_together,name number,orders,parse_name,plural,%
1550                 react_after,react_before,short_name,short_name_indef,time_left,%
1551                 time_out,when_closed,when_open,when_on,when_off,%
1552                 with_key},%
1553     %
1554     % Library routines
1555     morekeywords=[6]{Achieved,AfterRoutines,AllowPushDir,Banner,ChangePlayer,%
1556                 CommonAncestor,DictionaryLookup,GetGNAOfObject,HasLightSource,%
1557                 IndirectlyContains,IsSeeThrough,Locale,LoopOverScope,LTI_Insert,%
1558                 MoveFloatingObjects,NextWord,NextWordStopped,NounDomain,%
1559                 ObjectIsUntouchable OffersLight,ParseToken,PlaceInScope,PlayerTo,%
1560                 PronounNotice,PronounValue,ScopeWithin,SetPronoun,SetTime,%
1561                 StartDaemon,StartTimer,StopDaemon,StopTimer,TestScope,TryNumber,%
1562                 UnsignedCompare,WordAddress,WordInProperty,WordLength,%
1563                 WriteListFrom,YesOrNo},%
```

```
1564    %
1565    % Library,entry points
1566    morekeywords=[7]{AfterLife,AfterPrompt,Amusing,BeforeParsing,ChooseObjects,%
1567                DarkToDark,DeathMessage,GamePostRoutine GamePreRoutine,%
1568                Initialise,InScope,LookRoutine,NewRoom,ParseNoun,ParseNumber,%
1569                ParserError,PrintRank,PrintTaskName,PrintVerb,TimePasses,%
1570                UnknownVerb},%
1571    %
1572    % Library constants
1573    morekeywords=[8]{NEWLINE_BIT,INDENT_BIT,FULLINV_BIT,ENGLISH_BIT,RECURSE_BIT,%
1574                ALWAYS_BIT,TERSE_BIT,PARTINV_BIT,DEFART_BIT,WORKFLAG_BIT,%
1575                ISARE_BIT,CONCEAL_BIT},%
1576    %
1577    % Library,meta actions
1578    morekeywords=[9]{Pronouns,Quit,Restart,Restore,Save,Verify,ScriptOn,ScriptOff,%
1579                NotifyOn,NotifyOff,Places,Objects,Score,FullScore,Version,LMode1,%
1580                LMode2,Lmode3},%
1581    %
1582    % Library,main actions
1583    morekeywords=[10]{Close,Disrobe,Drop,Eat,Empty,EmptyT,Enter,Examine,Exit,GetOff,%
1584                Give,Go,GoIn,Insert,Inv,InvTall,InvWide,Lock,Look,Open,PutOn,Remove,%
1585                Search,Show,SwitchOff,SwitchOn,Take,Transfer,Unlock VagueGo,%
1586                Wear},%
1587    %
1588    % Library,stub actions
1589    morekeywords=[11]{Answer,Ask,AskFor,Attack,Blow,Burn,Buy,Climb,Consult,Cut,Dig,%
1590                Drink,Fill,Jump,JumpOver,Kiss,Listen,LookUnder,Mild,No,Pray,Pull,%
1591                Push,PushDir,Rub,Set,SetTo,Sing,Sleep,Smell,,Sleep,Smell,Sorry,%
1592                Squeeze,Strong,Swim,Swing,Taste,Tell,Think,ThrowAt,Tie,Touch,Turn,%
1593                Wait,Wake,WakeOther,Wave,WaveHands,Yes},%
1594    %
1595    otherkeywords={->,-->},%
1596    sensitive=false,%
1597    morestring=[d]{"},%
1598    morecomment=[l]{!}%
1599  }[keywords,comments,strings]%

1600 ⟨/lang2⟩
```

## 2.34   Java and other JVM based languages

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

```
1601 ⟨*lang1⟩

1602 %%
1603 %% AspectJ definition (c) Robert Wenner
1604 %%
1605 \lst@definelanguage[AspectJ]{Java}[]{Java}%
1606  {morekeywords={%
1607      adviceexecution,after,args,around,aspect,aspectOf,before,%
```

```
1608        call,cflow,cflowbelow,%
1609 % declare error,declare parents,declare precedence,
1610 % declare soft,declare warning,
1611        execution,get,handler,if,initialization,issingleton,pointcut,%
1612        percflow,percflowbelow,perthis,pertarget,preinitialization,%
1613        privileged,proceed,returning,set,staticinitialization,strictfp,%
1614        target,this,thisEnclosingJoinPoint,thisJoinPoint,throwing,%
1615        within,withincode},%
1616     MoreSelectCharTable=%
1617        \lst@DefSaveDef{`.}\lst@umdot{\lst@umdot\global\let\lst@derefop\@empty}%
1618        \ifx\lst@derefinstalled\@empty\else
1619          \global\let\lst@derefinstalled\@empty
1620 \lst@AddToHook{Output}%
1621 {\lst@ifkeywords
1622      \ifx\lst@derefop\@empty
1623        \global\let\lst@derefop\relax
1624        \ifx\lst@thestyle\lst@gkeywords@sty
1625          \ifx\lst@currstyle\relax
1626            \let\lst@thestyle\lst@identifierstyle
1627          \else
1628            \let\lst@thestyle\lst@currstyle
1629          \fi
1630        \fi
1631      \fi
1632 \fi}
1633 \lst@AddToHook{BOL}{\global\let\lst@derefop\relax}%
1634 \lst@AddTo\lst@ProcessSpace{\global\let\lst@derefop\relax}%
1635      \fi
1636   }%
```

1637 ⟨/lang1⟩

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

1638 ⟨∗lang1⟩

```
1639 \lst@definelanguage{Java}%
1640   {morekeywords={abstract,boolean,break,byte,case,catch,char,class,%
1641        const,continue,default,do,double,else,extends,false,final,%
1642        finally,float,for,goto,if,implements,import,instanceof,int,%
1643        interface,label,long,native,new,null,package,private,protected,%
1644        public,return,short,static,super,switch,synchronized,this,throw,%
1645        throws,transient,true,try,void,volatile,while},%
1646     sensitive,%
1647     morecomment=[l]//,%
1648     morecomment=[s]{/*}{*/},%
1649     morestring=[b]",%
1650     morestring=[b]',%
1651   }[keywords,comments,strings]%
```

Herbert Voss added the keyword `label`.

1652 ⟨/lang1⟩

Martine Gautier made the following contribution.

```
1653 ⟨*lang1⟩

1654 %%
1655 %% ByteCodeJava definition (c) 2004 Martine Gautier
1656 %%
1657 \lst@definelanguage{JVMIS}%
1658   {morekeywords={aaload,astore,aconst_null,aload,aload_0,aload_1,%
1659       aload_2,aload_3,anewarray,areturn,arraylength,astore,astore_0,%
1660       astore_1,astore_2,astore_3,athrow,baload,bastore,bipush,caload,%
1661       castore,checkcast,d2f,d2i,d2l,dadd,daload,dastore,dcmpg,dcmpl,%
1662       dconst_0,dconst_1,ddiv,dload,dload_0,dload_1,dload_2,dload_3,%
1663       dmul,dneg,drem,dreturn,dstore,dstore_0,dstore_1,dstore_2,%
1664       dstore_3,dsub,dup,dup_x1,dup_x2,dup2,dup2_x1,dup2_x2,f2d,%
1665       f2i,f2l,fadd,faload,fastore,fcmpg,fcmpl,fconst_0,fconst_1,%
1666       fconst_2,fdiv,fload,fload_0,fload_1,fload_2,fload_3,fmul,%
1667       fneg,frem,freturn,fstore,fstore_0,fstore_1,fstore_2,fstore_3,%
1668       fsub,getfield,getstatic,goto,goto_w,i2b,i2c,i2d,i2f,i2l,i2s,%
1669       iadd,iaload,iand,iastore,iconst_0,iconst_1,iconst_2,iconst_3,%
1670       iconst_4,iconst_5,idiv,if_acmpeq,if_acmpne,if_icmpeq,if_icmpne,%
1671       if_icmplt,if_cmpge,if_cmpgt,if_cmple,ifeq,ifne,iflt,ifge,ifgt,%
1672       ifle,ifnonnull,ifnull,iinc,iload,iload_0,iload_1,iload_2,%
1673       iload_3,imul,ineg,instanceof,invokeinterface,invokespecial,%
1674       invokestatic,invokevirtual,ior,irem,ireturn,ishl,ishr,istore,%
1675       istore_0,istore_1,istore_2,istore_3,isub,iushr,ixor,jsr,jsr_w,%
1676       l2d,l2f,l2i,ladd,laload,land,lastore,lcmp,lconst_0,lconst_1,%
1677       ldc,ldc_w,ldc2_w,ldiv,lload,lload_0,lload_1,lload_2,lload_3,%
1678       lmul,lneg,lookupswitch,lor,lrem,lreturn,lshl,lshr,lstore,%
1679       lstore_0,lstore_1,lstore_2,lstore_3,lsub,lushr,lxor,%
1680       monitorenter,monitorexit,multianewarray,new,newarray,nop,pop,%
1681       pop2,putfield,putstatic,ret,return,saload,sastore,sipush,swap,%
1682       tableswitch,wide,limit,locals,stack},%
1683   }[keywords]%

1684 ⟨/lang1⟩
```

### 2.34.1   Scala

Bastian Germann asked to include the Scala definition provided by Frank Teubler (2009). Here it is:

```
1685 ⟨*lang3⟩

1686 \lst@definelanguage{Scala}%
1687   {morekeywords={abstract,case,catch,class,def,%
1688     do,else,extends,false,final,finally,%
1689     for,if,implicit,import,lazy,match,mixin,%
1690     new,null,object,override,package,%
1691     private,protected,requires,return,sealed,%
1692     super,this,trait,true,try,%
1693     type,val,var,while,with,yield},%+
1694 % otherkeywords={_,:,=,=>,<<:,<\%,>:,\#,@},%
```

```
1695 otherkeywords={=,=>,<-,<\%,<:,>:,\#,@},%
1696     sensitive,%
1697     morecomment=[l]//,%
1698     morecomment=[n]{/*}{*/},%
1699     morestring=[b]",%
1700     morestring=[b]',%
1701     morestring=[b]""",%
1702   }[keywords,comments,strings]%
1703 ⟨/lang3⟩
```

## 2.35   ksh

Thanks to Jeffrey Ratcliffe for this language definition.

```
1704 ⟨*lang3⟩
```

```
1705 \lst@definelanguage{ksh}
1706   {morekeywords={alias,awk,cat,echo,else,elif,fi,exec,exit,%
1707       for,in,do,done,select,case,esac,while,until,function,%
1708       time,export,cd,eval,fc,fg,kill,let,pwd,read,return,rm,%
1709       glob,goto,history,if,logout,nice,nohup,onintr,repeat,sed,%
1710       set,setenv,shift,source,switch,then,umask,unalias,%
1711       unset,wait,@,env,argv,child,home,ignoreeof,noclobber,%
1712       noglob,nomatch,path,prompt,shell,status,verbose,print,printf,%
1713       sqrt,BEGIN,END},%
1714   morecomment=[l]\#,%
1715   morestring=[d]",%
1716   morestring=[d]',%
1717   morestring=[d]`%
1718   }[keywords,comments,strings]%
1719 %     \begin{macrocode}
1720 ⟨/lang3⟩
```

Herbert Voss suggested to add the string delimiter '.

## 2.36   Lingo

Thanks to Mark Schade for this language definition.

```
1721 ⟨*lang3⟩
```

```
1722 \lst@definelanguage{Lingo}
1723   {morekeywords={abort,after,and,before,do,down,halt,me,new,not,of,%
1724       on,or,otherwise,pass,put,result,return,set,tell,the,then,to,with,%
1725       repeat,while,case,if,else,true,false,global,property,\_global,\_key,%
1726       \_mouse,\_movie,\_player,\_sound,\_system,abbr,abbrev,abbreviated,abs,%
1727       actionsenabled,activateapplication,activatewindow,active3drenderer,%
1728       activecastlib,activewindow,actorlist,add,addat,addbackdrop,addcamera,%
1729       addchild,addmodifier,addoverlay,addprop,addtoworld,addvertex,alert,%
1730       alerthook,alignment,allowcustomcaching,allowgraphicmenu,allowsavelocal,%
1731       allowtransportcontrol,allowvolumecontrol,allowzooming,alphathreshold,%
1732       ambient,ambientcolor,ancestor,angle,anglebetween,animationenabled,%
```

```
1733    antialias,antialiasthreshold,append,applicationname,applicationpath,%
1734    appminimize,atan,attenuation,attributevalue,auto,autoblend,automask,%
1735    autotab,axisangle,back,backcolor,backdrop,backgroundcolor,backspace,%
1736    beep,beepon,beginrecording,beginsprite,beveldepth,beveltype,bgcolor,%
1737    bias,bitand,bitmap,bitmapsizes,bitnot,bitor,bitrate,bitspersample,%
1738    bitxor,blend,blendconstant,blendconstantlist,blendfactor,blendfunction,%
1739    blendfunctionlist,blendlevel,blendrange,blendsource,blendsourcelist,%
1740    blendtime,bone,bonesplayer,border,both,bottom,bottomcap,bottomradius,%
1741    bottomspacing,boundary,boundingsphere,box,boxdropshadow,boxtype,%
1742    breakconnection,breakloop,brightness,broadcastprops,browsername,%
1743    buffersize,build,buttonsenabled,buttonstyle,buttontype,bytesstreamed,%
1744    boolean,cachedocverify,cachesize,call,callancestor,camera,cameracount,%
1745    cameraposition,camerarotation,cancelidleload,castlib,castlibnum,%
1746    castmemberlist,center,centerregpoint,centerstage,changearea,channelcount,%
1747    char,characterset,charpostoloc,chars,charspacing,chartonum,%
1748    checkboxaccess,checkboxtype,checkmark,checknetmessages,child,chunksize,%
1749    clearatrender,clearcache,clearerror,clearframe,clearglobals,clearvalue,%
1750    clickloc,clickmode,clickon,clone,clonedeep,clonemodelfromcastmember,%
1751    clonemotionfromcastmember,close,closed,closewindow,closexlib,collision,%
1752    collisiondata,collisionnormal,color,world,colorbuffer,colorbufferdepth,%
1753    colordepth,colorlist,colorrange,colors,colorsteps,commanddown,comments,%
1754    compressed,connecttonetserver,constrainh,constraint,constrainv,,%
1755    continue,controldown,controller,copypixels,copyrightinfo,copyto,%
1756    copytoclipboard,cos,count,cpuhogticks,creaseangle,creases,[contains],%
1757    createfolder,createmask,creatematte,creationdate,creator,crop,cross,%
1758    crossproduct,cuepassed,cuepointnames,cuepointtimes,currentloopstate,%
1759    currentspritenum,currenttime,cursor,cursorsize,curve,cylinder,ate,day,%
1760    deactivateapplication,deactivatewindow,debug,debugplaybackenabled,%
1761    decaymode,defaultrect,defaultrectmode,delay,delete,deleteall,deleteat,%
1762    deletecamera,deletefolder,deleteframe,deletegroup,deletelight,%
1763    deletemodel,deletemodelresource,deletemotion,deleteone,deleteprop,%
1764    deleteshader,deletetexture,deletevertex,density,depth,depthbufferdepth,%
1765    desktoprectlist,diffuse,diffusecolor,diffuselightmap,%
1766    digitalvideotimescale,digitalvideotype,direction,directionalcolor,%
1767    directionalpreset,directtostage,disableimagingtransformation,displayface,%
1768    displaymode,distanceto,distribution,dither,done,doneparsing,dot,%
1769    dotproduct,doubleclick,downloadnetthing,drag,draw,drawrect,dropshadow,%
1770    duplicate,duplicateframe,duration,editable,editshortcutsenabled,%
1771    elapsedtime,emissive,emitter,empty,emulatemultibuttonmouse,enabled,%
1772    enablehotspot,end,endangle,endcolor,endframe,endrecording,endsprite,%
1773    endtime,enter,enterframe,environment,erase,error,eventpassmode,%
1774    exchange,exists,exit,exitframe,exitlock,exp,externalevent,%
1775    externalparamcount,externalparamname,externalparamvalue,extractalpha,%
1776    extrude3d,face,fadein,fadeout,fadeto,far,field,fieldofview,filename,%
1777    fill,fillcolor,fillcycles,filldirection,filled,fillmode,filloffset,%
1778    fillscale,findempty,findlabel,findpos,findposnear,finishidleload,%
1779    firstindent,fixedlinespace,fixedrate,fixstagesize,flashrect,flashtostage,%
1780    flat,fliph,flipv,float,floatp,floatprecision,flush,flushinputevents,%
1781    fog,folderchar,font,fontsize,fontstyle,forecolor,forget,frame,%
1782    framecount,framelabel,framepalette,framerate,frameready,framescript,%
```

```
1783    framesound1,framesound2,framestohms,frametempo,frametransition,freeblock,%
1784    freebytes,fromcastmember,fromimageobject,front,frontwindow,%
1785    generatenormals,getaprop,getat,getbehaviordescription,getbehaviortooltip,%
1786    getboneid,geterror,geterrorstring,gethardwareinfo,gethotspotrect,getlast,%
1787    getlatestnetid,getnetaddresscookie,getneterrorstring,getnetmessage,%
1788    getnetoutgoingbytes,getnettext,getnormalized,getnthfilenameinfolder,%
1789    getnumberwaitingnetmessages,getone,getpeerconnectionlist,getpixel,%
1790    getplaylist,getpos,getpref,getprop,getpropat,getpropertydescriptionlist,%
1791    getrendererservices,getstreamstatus,gettemppath,getworldtransform,globals,%
1792    glossmap,go,gotoframe,gotonetmovie,gotonetpage,gradienttype,gravity,%
1793    group,handler,handlers,height,heightvertices,high,highlightpercentage,%
1794    highlightstrength,hilite,hither,hittest,hmstoframes,hold,hotspot,html,%
1795    hyperlink,hyperlinkclicked,hyperlinkrange,hyperlinks,hyperlinkstate,%
1796    id3tags,identity,idle,idlehandlerperiod,idleloaddone,idleloadmode,%
1797    idleloadperiod,idleloadtag,idlereadchunksize,ilk,image,imagecompression,%
1798    imageenabled,imagequality,immovable,importfileinto,inflate,ink,inker,%
1799    inlineimeenabled,insertbackdrop,insertframe,insertoverlay,inside,%
1800    installmenu,instance,integer,integerp,interface,interpolate,%
1801    interpolateto,intersect,index,interval,inverse,invert,invertmask,%
1802    isbusy,isinworld,isoktoattach,ispastcuepoint,item,itemdelimiter,kerning,%
1803    kerningthreshold,key,keyboardfocussprite,keycode,keydown,keydownscript,%
1804    keyframeplayer,keypressed,keyup,keyupscript,label,labellist,last,%
1805    lastchannel,lastclick,lastevent,lastframe,lastkey,lastroll,left,%
1806    leftindent,length,lengthvertices,level,lifetime,light,line,linearlist,%
1807    linecolor,linecount,linedirection,lineheight,lineoffset,linepostolocv,%
1808    linesize,linkas,linked,list,listp,loaded,loadfile,loc,loch,locked,%
1809    locktranslation,loctocharpos,locv,locvtolinepos,locz,lod,log,long,%
1810    loop,loopcount,loopendtime,loopsremaining,loopstarttime,machinetype,%
1811    magnitude,map,mapImageToStage,mapmembertostage,mapstagetomember,margin,%
1812    marker,markerlist,mask,max,maxinteger,maxspeed,mci,media,mediaready,%
1813    member,membernum,members,memorysize,menu,mesh,meshdeform,milliseconds,%
1814    min,minspeed,modal,mode,model,modela,modelb,modelresource,%
1815    modelsunderloc,modelsunderray,modelunderloc,modified,modifiedby,%
1816    modifieddate,modifier,modifiers,month,mostrecentcuepoint,motion,%
1817    mousechar,mousedown,mousedownscript,mouseenter,mouseh,mouseitem,%
1818    mouseleave,mouselevel,mouseline,mouseloc,mousemember,mouseoverbutton,%
1819    mouseup,mouseupoutside,mouseupscript,mousev,mousewithin,mouseword,move,%
1820    moveablesprite,movetoback,movetofront,movevertex,movevertexhandle,%
1821    movewindow,movie,movieaboutinfo,moviecopyrightinfo,moviefilefreesize,%
1822    moviefilesize,moviefileversion,movieimagecompression,movieimagequality,%
1823    moviename,moviepath,movierate,movietime,moviextralist,mpeglayer,%
1824    multiply,multisound,name,near,nearfiltering,neighbor,netabort,netdone,%
1825    neterror,netlastmoddate,netmime,netpresent,netstatus,nettextresult,%
1826    netthrottleticks,newcamera,newcurve,newgroup,newlight,newmesh,newmodel,%
1827    newmodelresource,newmotion,newshader,newtexture,next,none,normalize,%
1828    normallist,normals,nothing,notify,nudge,number,numchannels,%
1829    numparticles,numsegments,numtochar,objectp,offset,open,openresfile,%
1830    openwindow,openxlib,optiondown,organizationname,originalfont,originh,%
1831    originmode,originpoint,originv,orthoheight,overlay,pageheight,palette,%
1832    palettemapping,paletteref,paletteindex,pan,paragraph,param,paramcount,%
```

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```
1833    parent,parsestring,particle,pasteclipboardinto,path,pathname,%
1834    pathstrength,pattern,pause,pausedatstart,pausestate,percentplayed,%
1835    percentstreamed,period,perpendicularto,persistent,pi,picture,picturep,%
1836    plane,platform,play,playbackmode,playfile,playing,playlist,playnext,%
1837    playrate,point,pointat,pointatorientation,pointinhyperlink,%
1838    pointofcontact,pointtochar,pointtoitem,pointtoline,pointtoparagraph,%
1839    pointtoword,position,positionreset,posterframe,postnettext,power,%
1840    preferred3drenderer,preload,preloadbuffer,preloadeventabort,preloadmember,%
1841    preloadmode,preloadmovie,preloadnetthing,preloadram,preloadtime,%
1842    premultiply,prepareframe,preparemovie,prerotate,prescale,pretranslate,%
1843    previous,primitives,printfrom,productversion,projection,projectionangle,%
1844    propList,proxyserver,pttohotspotid,puppet,puppetpalette,puppetsound,%
1845    puppetsprite,puppettempo,puppettransition,purgepriority,%
1846    qtregisteraccesskey,qtunregisteraccesskey,quad,quality,queue,quit,quote,%
1847    radius,ramneeded,random,randomseed,randomvector,rateshift,rawnew,read,%
1848    readvalue,recordfont,rect,ref,reflectionmap,reflectivity,region,%
1849    registerforevent,registerscript,regpoint,regpointvertex,removebackdrop,%
1850    removefromworld,removelast,removemodifier,removeoverlay,rename,renderer,%
1851    rendererdevicelist,renderformat,renderstyle,resetworld,resizewindow,%
1852    resolution,resolve,resolvea,resolveb,resource,restart,resume,%
1853    reverttoworlddefaults,rewind,rgb,rgba4444,rgba5550,rgba5551,rgba5650,%
1854    rgba8880,rgba8888,right,rightindent,rightmousedown,rightmouseup,%
1855    rollover,romanlingo,rootlock,rootnode,rotate,rotation,rotationreset,%
1856    rtf,runmode,runpropertydialog,safeplayer,samplecount,samplerate,%
1857    samplesize,save,savedlocal,savemovie,scale,scalemode,score,scorecolor,%
1858    scoreselection,script,scriptexecutionstyle,scriptinstancelist,scriptlist,%
1859    scriptnum,scriptsenabled,scripttext,scripttype,scrollbyline,scrollbypage,%
1860    scrolltop,sds,searchcurrentfolder,searchpath,searchpaths,seconds,%
1861    selectedtext,selection,selend,selstart,sendallsprites,sendevent,%
1862    sendnetmessage,sendsprite,serialnumber,setalpha,setaprop,setat,%
1863    setcollisioncallback,setflashproperty,setnetbufferlimits,%
1864    setnetmessagehandler,setpixel,setplaylist,setpref,setprop,setscriptlist,%
1865    settrackenabled,setvariable,shader,shaderlist,shadowpercentage,%
1866    shadowstrength,shapetype,shiftdown,shininess,shockwave3d,short,%
1867    showglobals,showlocals,showprops,showresfile,showxlib,shutdown,%
1868    silhouettes,sin,size,sizerange,skew,sleep,smoothness,sort,sound,%
1869    soundbusy,soundchannel,sounddevice,sounddevicelist,soundenabled,%
1870    soundkeepdevice,soundlevel,soundmixmedia,source,sourcerect,space,%
1871    specular,specularcolor,specularlightmap,sphere,spotangle,spotdecay,%
1872    sprite,spritenum,spritespacetoworldspace,sqrt,stage,stagebottom,%
1873    stagecolor,stageleft,stageright,stagetoflash,stagetop,standard,%
1874    startangle,startframe,startmovie,starttime,starttimer,state,static,%
1875    status,stepframe,stilldown,stop,stopevent,stopmovie,stoptime,stream,%
1876    streammode,streamname,streamsize,streamstatus,string,stringp,%
1877    strokecolor,strokewidth,style,subdivision,sweep,swing,switchcolordepth,%
1878    symbol,symbolp,systemdate,tab,tabcount,tabs,tan,target,%
1879    tellstreamstatus,tension,text,texture,texturecoordinatelist,%
1880    texturecoordinates,texturelayer,texturelist,texturemember,texturemode,%
1881    texturemodelist,texturerenderformat,texturerepeat,texturerepeatlist,%
1882    texturetransform,texturetransformlist,texturetype,thumbnail,ticks,tilt,%
```

```
1883        time,timeout,timeouthandler,timeoutkeydown,timeoutlapsed,timeoutlength,%
1884        timeoutlist,timeoutmouse,timeoutplay,timeoutscript,timer,timescale,%
1885        title,titlevisible,toon,top,topcap,topradius,topspacing,trace,%
1886        traceload,tracelogfile,trackcount,trackenabled,tracknextkeytime,%
1887        tracknextsampletime,trackpreviouskeytime,trackprevioussampletime,%
1888        trackstarttime,trackstoptime,tracktext,tracktype,trails,transform,%
1889        transitiontype,translate,triggercallback,trimwhitespace,tunneldepth,%
1890        tweened,tweenmode,type,[transparent],union,unload,unloadmember,%
1891        unloadmovie,unregisterallevents,update,updateframe,updatelock,%
1892        updatemovieenabled,updatestage,url,usealpha,usediffusewithtexture,%
1893        usefastquads,usehypertextstyles,uselineoffset,userdata,username,value,%
1894        vector,version,vertex,vertexlist,vertices,video,videoforwindowspresent,%
1895        viewh,viewpoint,viewscale,viewv,visibility,visible,void,voidp,volume,%
1896        volumeinfo,wait,waitfornetconnection,warpmode,width,widthvertices,wind,%
1897        window,windowlist,windowpresent,windowtype,word,wordwrap,world,%
1898        worldposition,worldspacetospritespace,worldtransform,wraptransform,%
1899        wraptransformlist,write,writevalue,,xaxis,xtra,xtralist,xtras,,yaxis,%
1900        year,yon,zaxis,zoombox,zoomwindow,repeat,Conditional,Boolean,TypeDef,%
1901        Statement,Operator,String,Comment,Identifier,Special,x,y,z}
1902    sensitive=false,
1903    morecomment=[l]{--},
1904    morestring=[b]",
1905   }[keywords,comments,strings]%
1906 %     \begin{macrocode}
1907 ⟨/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.

```
1908 ⟨*lang2⟩

1909 \lst@definelanguage{Lisp}%
1910   {morekeywords={abort,abs,acons,acos,acosh,adjoin,alphanumericp,alter,%
1911       append,apply,apropos,aref,arrayp,ash,asin,asinh,assoc,atan,atanh,%
1912       atom,bit,boole,boundp,break,butlast,byte,catenate,ceiling,cerror,%
1913       char,character,characterp,choose,chunk,cis,close,clrhash,coerce,%
1914       collect,commonp,compile,complement,complex,complexp,concatenate,%
1915       conjugate,cons,consp,constantp,continue,cos,cosh,cotruncate,%
1916       count,delete,denominator,describe,directory,disassemble,%
1917       documentation,dpb,dribble,ed,eighth,elt,enclose,endp,eq,eql,%
1918       equal,equalp,error,eval,evalhook,evenp,every,exp,expand,export,%
1919       expt,fboundp,fceiling,fdefinition,ffloor,fifth,fill,find,first,%
```

```
1920       float,floatp,floor,fmakunbound,format,fourth,fround,ftruncate,%
1921       funcall,functionp,gatherer,gcd,generator,gensym,gentemp,get,getf,%
1922       gethash,identity,imagpart,import,inspect,integerp,intern,%
1923       intersection,tively,isqrt,keywordp,last,latch,lcm,ldb,ldiff,%
1924       length,list,listen,listp,load,log,logand,logbitp,logcount,logeqv,%
1925       logior,lognand,lognor,lognot,logtest,logxor,macroexpand,%
1926       makunbound,map,mapc,mapcan,mapcar,mapcon,maphash,mapl,maplist,%
1927       mask,max,member,merge,min,mingle,minusp,mismatch,mod,namestring,%
1928       nbutlast,nconc,nintersection,ninth,not,notany,notevery,nreconc,%
1929       nreverse,nsublis,nsubst,nth,nthcdr,null,numberp,numerator,nunion,%
1930       oddp,open,packagep,pairlis,pathname,pathnamep,phase,plusp,%
1931       position,positions,pprint,previous,princ,print,proclaim,provide,%
1932       random,rassoc,rational,rationalize,rationalp,read,readtablep,%
1933       realp,realpart,reduce,rem,remhash,remove,remprop,replace,require,%
1934       rest,revappend,reverse,room,round,rplaca,rplacd,sbit,scan,schar,%
1935       search,second,series,set,seventh,shadow,signal,signum,sin,sinh,%
1936       sixth,sleep,some,sort,split,sqrt,streamp,string,stringp,sublis,%
1937       subseq,subseries,subsetp,subst,substitute,subtypep,svref,sxhash,%
1938       symbolp,tailp,tan,tanh,tenth,terpri,third,truename,truncate,%
1939       typep,unexport,unintern,union,until,values,vector,vectorp,warn,%
1940       write,zerop,and,assert,case,ccase,cond,ctypecase,decf,declaim,%
1941       defclass,defconstant,defgeneric,defmacro,defmethod,defpackage,%
1942       defparameter,defsetf,defstruct,deftype,defun,defvar,do,dolist,%
1943       dotimes,ecase,encapsulated,etypecase,flet,formatter,gathering,%
1944       incf,iterate,labels,let,locally,loop,macrolet,mapping,or,pop,%
1945       producing,prog,psetf,psetq,push,pushnew,remf,return,rotatef,%
1946       setf,shiftf,step,time,trace,typecase,unless,untrace,when},%
1947     sensitive,% ???
1948     alsodigit=-,%
1949     morecomment=[l];,%
1950     morecomment=[s]{\#|}{|\#},% 1997 Aslak Raanes
1951     morestring=[b]"%
1952   }[keywords,comments,strings]%

1953 ⟨/lang2⟩

1954 ⟨∗lang2⟩
```

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

```
1955 %%
1956 %% AutoLISP/VisualLISP - Stefan Lagotzki, info@lagotzki.de
1957 %%
1958 \lst@definelanguage[Auto]{Lisp}%
1959   {morekeywords={abs,acad_colordlg,acad_helpdlg,acad_strlsort,%
1960       action_tile,add_list,alert,alloc,and,angle,angtof,angtos,append,%
1961       apply,arx,arxload,arxunload,ascii,assoc,atan,atof,atoi,atom,%
1962       atoms-family,autoarxload,autoload,Boole,boundp,caddr,cadr,car,%
1963       cdr,chr,client_data_tile,close,command,cond,cons,cos,cvunit,%
1964       defun,defun-q,defun-q-list-ref,defun-q-list-set,dictadd,dictnext,%
1965       dictremove,dictrename,dictsearch,dimx_tile,dimy_tile,distance,%
1966       distof,done_dialog,end_image,end_list,entdel,entget,entlast,%
```

```
1967    entmake,entmakex,entmod,entnext,entsel,entupd,eq,equal,*error*,%
1968    eval,exit,exp,expand,expt,fill_image,findfile,fix,float,foreach,%
1969    function,gc,gcd,get_attr,get_tile,getangle,getcfg,getcname,%
1970    getcorner,getdist,getenv,getfiled,getint,getkword,getorient,%
1971    getpoint,getreal,getstring,getvar,graphscr,grclear,grdraw,grread,%
1972    grtext,grvecs,handent,help,if,initdia,initget,inters,itoa,lambda,%
1973    last,layoutlist,length,list,listp,load,load_dialog,log,logand,%
1974    logior,lsh,mapcar,max,mem,member,menucmd,menugroup,min,minusp,%
1975    mode_tile,namedobjdict,nentsel,nentselp,new_dialog,not,nth,%
1976    null,numberp,open,or,osnap,polar,prin1,princ,print,progn,prompt,%
1977    quit,quote,read,read-char,read-line,redraw,regapp,rem,repeat,%
1978    reverse,rtos,set,set_tile,setcfg,setenv,setfunhelp,setq,%
1979    setvar,setview,sin,slide_image,snvalid,sqrt,ssadd,ssdel,ssget,%
1980    ssgetfirst,sslength,ssmemb,ssname,ssnamex,sssetfirst,startapp,%
1981    start_dialog,start_image,start_list,strcase,strcat,strlen,subst,%
1982    substr,tablet,tblnext,tblobjname,tblsearch,term_dialog,terpri,%
1983    textbox,textpage,textscr,trace,trans,type,unload_dialog,untrace,%
1984    vector_image,ver,vl-acad-defun,vl-acad-undefun,vl-arx-import,%
1985    vl-bb-ref,vl-bb-set,vl-catch-all-apply,%
1986    vl-catch-all-error-message,vl-catch-all-error-p,vl-cmdf,vl-consp,%
1987    vl-directory-files,vl-doc-export,vl-doc-import,vl-doc-ref,%
1988    vl-doc-set,vl-every,vl-exit-with-error,vl-exit-with-value,%
1989    vl-file-copy,vl-file-delete,vl-file-directory-p,vl-file-rename,%
1990    vl-file-size,vl-file-systime,vl-filename-base,%
1991    vl-filename-directory,vl-filename-extension,vl-filename-mktemp,%
1992    vl-get-resource,vl-list*,vl-list->string,%
1993    vl-list-exported-functions,vl-list-length,vl-list-loaded-vlx,%
1994    vl-load-all,vl-load-com,vl-load-reactors,vl-member-if,%
1995    vl-member-if-not,vl-position,vl-prin1-to-string,%
1996    vl-princ-to-string,vl-propagate,vl-registry-delete,%
1997    vl-registry-descendents,vl-registry-read,vl-registry-write,%
1998    vl-remove,vl-remove-if,vl-remove-if-not,vl-some,vl-sort,%
1999    vl-sort-i,vl-string->list,vl-string-elt,vl-string-left-trim,%
2000    vl-string-mismatch,vl-string-position,vl-string-right-trim,%
2001    vl-string-search,vl-string-subst,vl-string-translate,%
2002    vl-string-trim,vl-symbol-name,vl-symbol-value,vl-symbolp,%
2003    vl-unload-vlx,vl-vbaload,vl-vbarun,vl-vlx-loaded-p,vlax-3D-point,%
2004    vlax-add-cmd,vlax-create-object,vlax-curve-getArea,%
2005    vlax-curve-getDistAtParam,vlax-curve-getDistAtPoint,%
2006    vlax-curve-getEndParam,vlax-curve-getEndPoint,%
2007    vlax-curve-getParamAtDist,vlax-curve-getParamAtPoint,%
2008    vlax-curve-getPointAtDist,vlax-curve-getPointAtParam,%
2009    vlax-curve-getStartParam,vlax-curve-getStartPoint,%
2010    vlax-curve-isClosed,vlax-curve-isPeriodic,vlax-curve-isPlanar,%
2011    vlax-curve-getClosestPointTo,%
2012    vlax-curve-getClosestPointToProjection,vlax-curve-getFirstDeriv,%
2013    vlax-curve-getSecondDeriv,vlax-dump-object,%
2014    vlax-ename->vla-object,vlax-erased-p,vlax-for,%
2015    vlax-get-acad-object,vlax-get-object,vlax-get-or-create-object,%
2016    vlax-get-property,vlax-import-type-library,vlax-invoke-method,%
```

```
2017        vlax-ldata-delete,vlax-ldata-get,vlax-ldata-list,vlax-ldata-put,%
2018        vlax-ldata-test,vlax-make-safearray,vlax-make-variant,%
2019        vlax-map-collection,vlax-method-applicable-p,%
2020        vlax-object-released-p,vlax-product-key,%
2021        vlax-property-available-p,vlax-put-property,vlax-read-enabled-p,%
2022        vlax-release-object,vlax-remove-cmd,vlax-safearray-fill,%
2023        vlax-safearray-get-dim,vlax-safearray-get-element,%
2024        vlax-safearray-get-l-bound,vlax-safearray-get-u-bound,%
2025        vlax-safearray-put-element,vlax-safearray-type,%
2026        vlax-safearray->list,vlax-tmatrix,vlax-typeinfo-available-p,%
2027        vlax-variant-change-type,vlax-variant-type,vlax-variant-value,%
2028        vlax-vla-object->ename,vlax-write-enabled-p,vlisp-compile,%
2029        vlr-acdb-reactor,vlr-add,vlr-added-p,vlr-beep-reaction,%
2030        vlr-command-reactor,vlr-current-reaction-name,vlr-data,%
2031        vlr-data-set,vlr-deepclone-reactor,vlr-docmanager-reactor,%
2032        vlr-dwg-reactor,vlr-dxf-reactor,vlr-editor-reactor,%
2033        vlr-insert-reactor,vlr-linker-reactor,vlr-lisp-reactor,%
2034        vlr-miscellaneous-reactor,vlr-mouse-reactor,vlr-notification,%
2035        vlr-object-reactor,vlr-owner-add,vlr-owner-remove,vlr-owners,%
2036        vlr-pers,vlr-pers-list,vlr-pers-p,vlr-pers-release,%
2037        vlr-reaction-names,vlr-reaction-set,vlr-reactions,vlr-reactors,%
2038        vlr-remove,vlr-remove-all,vlr-set-notification,%
2039        vlr-sysvar-reactor,vlr-toolbar-reactor,vlr-trace-reaction,%
2040        vlr-type,vlr-types,vlr-undo-reactor,vlr-wblock-reactor,%
2041        vlr-window-reactor,vlr-xref-reactor,vports,wcmatch,while,%
2042        write-char,write-line,xdroom,xdsize,zerop},%
2043     alsodigit=->,%
2044     otherkeywords={1+,1-},%
2045     sensitive=false,%
2046     morecomment=[l];,%
2047     morecomment=[l];;,%
2048     morestring=[b]"%
2049    }[keywords,comments,strings]%
```

2050 ⟨/lang2⟩

2051 ⟨∗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. . .

```
2052 \lst@definelanguage{elisp}[][Lisp]{%
2053   morekeywords={begin, car, cdr, cons, define, display, drop, filter,%
2054     hash-ref, hash-set, if, load-file, lambda, length, map, message,%
2055     progn, quote, require, setq, string-append, take, vector,%
2056   },%
2057   sensitive,%
2058   alsodigit=->,%
2059   otherkeywords={1+,1-},%
2060   sensitive=true,%
2061   morecomment=[l];,%
```

```
2062    morecomment=[l];;,%
2063    morestring=[b]"%
2064 }[keywords,comments,strings]%
```

2065 ⟨/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

2066 ⟨∗lang3⟩

```
2067 \lst@definelanguage{LLVM}{%
2068    morekeywords={%
```

- Instructions

```
2069          ret,br,switch,indirectbr,invoke,resume,unreachable,%
2070          add,fadd,sub,fsub,mul,fmul,udiv,sdiv,fdiv,urem,srem,frem,%
2071          shl,lshr,ashr,and,or,xor,%
2072          extractelement,insertelement,shufflevector,%
2073          extractvalue,insertvalue,%
2074          alloca,load,store,fence,cmpxchg,atomicrmw,getelementptr,%
2075          trunc,zext,sext,fptrunc,fpext,fptoui,fptosi,uitofp,sitofp,ptrtoint,%
2076          inttoptr,bitcast,to,%
2077          icmp,fcmp,phi,select,call,va_arg,landingpad,%
```

- Atomic operations – some duplication with the above

```
2078          xchg,add,sub,and,nand,or,xor,max,min,umax,umin,%
```

- Comparisons

```
2079          eq,ne,ugt,uge,ult,ule,sgt,sge,slt,sle,%
2080          false,oeq,ogt,oge,olt,ole,one,ord,ueq,ugt,uge,ult,ule,une,uno,true,%
```

- Linkage types

```
2081          private,linker_private,linker_private_weak,linker_private_weak_def_auto,%
2082          internal,available_externally,linkonce,common,weak,appending,extern_weak,%
2083          linkonce_odr,weak_odr,external,dllimport,dllexport,%
```

- Function headers

```
2084          define,declare,%
```

- Parameter attributes

```
2085          zeroext,signext,inreg,byval,sret,noalias,nocapture,next,%
```

---

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

- Garbage collector names

```
2086        gc,%
```

- Function attributes

```
2087        address_safety,alignstack,alwaysinline,nonlazybind,inlinehint,naked,%
2088        noimplicitfloat,noinline,noredzone,noreturn,nounwind,optsize,readnone,%
2089        readonly,returns_twice,ssp,sspreq,uwtable,%
```

- Module-level inline assembly

```
2090        module,asm,%
```

- Data layout

```
2091        target,datalayout,%
```

- Inline assembler expressions

```
2092        sideeffect,alignstack,%
```

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

```
2093        nuw,nsw,exact,inbounds,unnamed_addr},%
2094      morekeywords=[2]{%
```

- Types

```
2095        i1,i2,i4,i8,i16,i32,i64,i128,i256,i512,i1024,% <-- Most common integers
2096        half,float,double,x86_fp80,fp128,ppc_fp128,x86mmx,%
2097        void,label,metadata},%
2098      alsoletter=.,%
2099      sensitive=false,%
2100      morecomment=[l];,%
2101      morestring=[b]"%
2102    }
```

```
2103 ⟨/lang3⟩
```

## 2.39   Logo

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

```
2104 ⟨*lang3⟩
```

```
2105 \lst@definelanguage{Logo}%
2106 % ??? {end,unix} also keywords
2107   {morekeywords={and,atan,arctan,both,break,bf,bl,butfirst,butlast,%
2108       cbreak, close,co,continue,cos,count,clearscreen,cs,debquit,%
2109       describe,diff,difference,ed,edit,either,emptyp,equalp,er,erase,%
2110       errpause,errquit,fifp,filefprint,fifty,fileftype,fip,fileprint,%
2111       fird,fileread,fity,filetype,fiwd,fileword,f,first,or,fp,fprint,%
2112       fput,fty,ftype,full,fullscreen,go,bye,goodbye,gprop,greaterp,%
2113       help,if,iff,iffalse,ift,iftrue,nth,item,keyp,llast,lessp,list,%
```

```
2114      local,lput,make,max,maximum,memberp,memtrace,min,minimum,namep,%
2115      not,numberp,oflush,openr,openread,openw,openwrite,op,output,%
2116      pause,plist,pots,pow,pprop,pps,pr,print,product,quotient,random,%
2117      rc,readchar,rl,readlist,remprop,repcount,repeat,request,rnd,run,%
2118      se,sentence,sentencep,setc,setcolor,setipause,setqpause,po,show,%
2119      sin,split,splitscreen,sqrt,stop,sum,test,text,textscreen,thing,%
2120      to,tone,top,toplevel,type,untrace,wait,word,wordp,yaccdebug,is,%
2121      mod,remainder,trace,zerop,back,bk,bto,btouch,fd,forward,fto,%
2122      ftouch,getpen,heading,hit,hitoot,ht,hideturtle,loff,lampoff,lon,%
2123      lampon,lt,left,lot,lotoot,lto,ltouch,penc,pencolor,pd,pendown,pe,%
2124      penerase,penmode,pu,penup,px,penreverse,rt,right,rto,rtouch,%
2125      scrunch,seth,setheading,setscrun,setscrunch,setxy,shownp,st,%
2126      showturtle,towardsxy,clean,wipeclean,xcor,ycor,tur,turtle,%
2127      display,dpy},%
2128   sensitive=f% ???
2129  }[keywords]%

2130 ⟨/lang3⟩
```

## 2.40   Lua

Stephan Hennig contributed the Lua keywords.

2131 ⟨∗lang2⟩

We begin with the keywords for Lua 5.0:

```
2132 %%
2133 %% Lua definitions (c) 2013 Stephan Hennig
2134 %%
2135 \lst@definelanguage[5.0]{Lua}{%
```

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

```
2136   alsoletter={.},%
```

The language definition knows

- language keywords

```
2137      morekeywords=[1]{%
2138        and, break, do, else, elseif, end, false, for, function, if, in,%
2139        local, nil, not, or, repeat, return, then, true, until, while,%
2140      },%
```

- the standard library identifiers

```
2141      morekeywords=[2]{%
```

- coming from the base library

```
2142          _G, _LOADED, _REQUIREDNAME, _VERSION, LUA_PATH,%
2143          assert, collectgarbage, dofile, error, gcinfo, getfenv,%
2144          getmetatable, ipairs, loadfile, loadlib, loadstring, newproxy,%
2145          next, pairs, pcall, print, rawequal, rawget, rawset, require,%
2146          setfenv, setmetatable, tonumber, tostring, type, unpack, xpcall,%
```

- coming from the coroutine library

```
2147                 coroutine, coroutine.create, coroutine.resume,%
2148                 coroutine.status, coroutine.wrap, coroutine.yield,%
```

- the debug library

```
2149                 _TRACEBACK, debug, debug.debug, debug.gethook, debug.getinfo,%
2150                 debug.getlocal, debug.getupvalue, debug.sethook, debug.setlocal,%
2151                 debug.setupvalue,debug.traceback,%
```

- the io library

```
2152                 io, io.close, io.flush, io.input, io.lines, io.open, io.output,%
2153                 io.popen, io.read, io.stderr, io.stdin, io.stdout, io.tmpfile,%
2154                 io.type, io.write,%
```

- the mathematical library

```
2155                 __pow, math, math.abs, math.acos, math.asin, math.atan, math.atan2,%
2156                 math.ceil, math.cos, math.deg, math.exp, math.floor, math.frexp,%
2157                 math.ldexp, math.log, math.log10, math.max, math.min, math.mod,%
2158                 math.pi, math.pow, math.rad, math.random, math.randomseed, math.sin,%
2159                 math.sqrt, math.tan,%
```

- the os library

```
2160                 os, os.clock, os.date, os.difftime, os.execute, os.exit, os.getenv,%
2161                 os.remove, os.rename, os.setlocale, os.time, os.tmpname,%
```

- the string library

```
2162                 string, string.byte, string.char, string.dump, string.find,%
2163                 string.format, string.gfind, string.gsub, string.len, string.lower,%
2164                 string.rep, string.sub, string.upper,%
```

- the table library

```
2165                 table, table.concat, table.foreach, table.foreachi, table.getn,%
2166                 table.insert, table.remove, table.setn, table.sort,%
2167             },%
```

and some additional identifiers

```
2168   morekeywords=[2]{%
2169     _PROMPT, _PROMPT2, arg,%
2170   },%
```

These are the common language settings

```
2171   sensitive=true,%
2172   % single line comments
2173   morecomment=[l]{--},%
2174   % multi line comments
2175   morecomment=[s]{--[[}{]]},%
2176   % backslash escaped strings
2177   morestring=[b]",%
2178   morestring=[b]',%
2179   % multi line strings
2180   morestring=[s]{[[}{]]},%
2181 }[keywords,comments,strings]%
```

And here are the new definitions for Lua 5.1:

```
2182 \lst@definelanguage[5.1]{Lua}[5.0]{Lua}{%
```

There are some deletions

```
2183   deletekeywords=[2]{%
```

concerning

- the base library

```
2184        _LOADED, _REQUIREDNAME, LUA_PATH, gcinfo, loadlib,%
```

- the debug library

```
2185        _TRACEBACK,%
```

- the mathematical library

```
2186        __pow, math.mod,%
```

- the string library

```
2187        string.gfind,%
```

- the table library

```
2188        table.foreach, table.foreachi, table.getn, table.setn,%
2189      },%
```

and some new identifiers in standard libraries like

```
2190   morekeywords=[2]{%
```

- the base library

```
2191        load, select,%
```

- coroutine library

```
2192        coroutine.running,%
```

- debug library

```
2193        debug.getfenv, debug.getmetatable, debug.getregistry, debug.setfenv,%
2194        debug.setmetatable,%
```

- the mathematical library

```
2195        math.cosh, math.fmod, math.huge, math.modf, math.sinh, math.tanh,%
```

- the package library which itself is new in Lua 5.1

```
2196        module, package, package.config, package.cpath, package.loaded,%
2197        package.loaders, package.loadlib, package.path, package.preload,%
2198        package.seeall,%
```

- the string library and

```
2199        string.gmatch, string.match, string.reverse,%
```

- the table library

```
2200        table.maxn,%
2201      },%
```

In Lua 5.1 long bracket comments were introduced also

```
2202  morecomment=[s]{--[[}{]]},%
2203  morecomment=[s]{--[==[}{]==]},%
2204  morecomment=[s]{--[===[}{]===]},%
2205  morecomment=[s]{--[====[}{]====]},%
2206  morecomment=[s]{--[=====[}{]=====]},%
2207  morecomment=[s]{--[======[}{]======]},%
2208  morecomment=[s]{--[=======[}{]=======]},%
2209  morecomment=[s]{--[========[}{]========]},%
2210  morecomment=[s]{--[=========[}{]=========]},%
2211  morecomment=[s]{--[==========[}{]==========]},%
```

as well as long bracket strings

```
2212  morestring=[s]{[[}{]]},%
2213  morestring=[s]{[==[}{]==]},%
2214  morestring=[s]{[===[}{]===]},%
2215  morestring=[s]{[====[}{]====]},%
2216  morestring=[s]{[=====[}{]=====]},%
2217  morestring=[s]{[======[}{]======]},%
2218  morestring=[s]{[=======[}{]=======]},%
2219  morestring=[s]{[========[}{]========]},%
2220  morestring=[s]{[=========[}{]=========]},%
2221  morestring=[s]{[==========[}{]==========]},%
2222 }[keywords,comments,strings]%
```

Lua 5.2 again has some changed features. These are

```
2223 \lst@definelanguage[5.2]{Lua}[5.1]{Lua}{%
```

- new language keywords

```
2224        morekeywords=[1]{%
2225          goto,%
2226        },%
```

- deleted identifiers from the standard libraries like

```
2227        deletekeywords=[2]{%
```

  – the base library

```
2228          getfenv, loadstring, module, newproxy, setfenv, unpack,%
```

  – the debug library

```
2229          debug.getfenv, debug.setfenv,%
```

  – the mathematical library

```
2230          math.log10,%
```

> – the package library and

```
2231            package.loaders, package.seeall,%
```

> – the table library

```
2232            table.maxn,%
2233          },%
```

Again there are some new identifiers in the standard libraries

```
2234  morekeywords=[2]{%
```

like

- the base library

```
2235          rawlen,%
```

- the bit library

```
2236          bit32, bit32.arshift, bit32.band, bit32.bnot, bit32.bor,%
2237          bit32.btest, bit32.bxor, bit32.extract, bit32.lrotate,%
2238          bit32.lshift, bit32.replace, bit32.rrotate, bit32.rshift,%
```

- the debug library

```
2239          debug.getuservalue, debug.setuservalue, debug.upvalueid,%
2240          debug.upvaluejoin,%
```

- the package library

```
2241          package.searchers, package.searchpath,%
```

- the table library

```
2242          table.pack, table.unpack,%
2243        },%
```

There is a new additional identifier

```
2244  morekeywords=[2]{%
2245    _ENV,%
2246  },%
```

and labels are also new in Lua 5.2

```
2247  moredelim=[s][keywordstyle3]{::}{::},%
2248 }[keywords,comments,strings]%
```

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

```
2249 \lst@definelanguage[5.3]{Lua}[5.2]{Lua}{%
```

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

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

59

– the `bit32` library

```
2251              bit32, bit32.arshift, bit32.band, bit32.bnot, bit32.bor,%
2252              bit32.btest, bit32.bxor, bit32.extract, bit32.lrotate,%
2253              bit32.lshift, bit32.replace, bit32.rrotate, bit32.rshift,%
```

– the mathematical library

```
2254              math.atan2, math.cosh, math.frexp, math.ldexp, math.pow,%
2255              math.sinh, math.tanh,%
2256            },%
```

Again there are some new identifiers in the standard libraries

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

like

- the coroutine library

```
2258            coroutine.isyieldable,%
```

- the mathematical library

```
2259            math.maxinteger, math.mininteger, math.tointeger, math.type,%
2260            math.ult,%
```

- the string library

```
2261            string.pack, string.packsize, string.unpack,%
```

- the table library

```
2262            table.move,%
```

- the utf-8 library

```
2263            utf8, utf8.char, utf8.charpattern, utf8.codepoint, utf8.codes,%
2264            utf8.len, utf8.offset,%
2265          },%
2266        }[keywords,comments,strings]%
```

```
2267        ⟨/lang2⟩
```

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

```
2268  ⟨*lua-prf⟩
```

```
2269 \usepackage[rgb, x11names]{xcolor}
2270 \lstdefinestyle{Lua}{%
2271   language=[5.2]Lua,
2272   basicstyle=\ttfamily,
2273   columns=spaceflexible,
2274   keywordstyle=\bfseries\color{Blue4},% language keywords
2275   keywordstyle=[2]\bfseries\color{RoyalBlue3},% std. library identifiers
2276   keywordstyle=[3]\bfseries\color{Purple3},% labels
2277   stringstyle=\bfseries\color{Coral4},% strings
2278   commentstyle=\itshape\color{Green4},% comments
2279 }
```

60

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

2280 ⟨/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).

2281 ⟨*lang2⟩

```
2282 %%
2283 %% Make definitions (c) 2000 Rolf Niepraschk
2284 %%
2285 \lst@definelanguage[gnu]{make}%
2286    {morekeywords={SHELL,MAKE,MAKEFLAGS,$@,$\%,$<,$?,$^,$+,$*,%
2287        @,^,<,\%,+,?,*,% Markus Pahlow
2288        export,unexport,include,override,define,ifdef,ifneq,ifeq,else,%
2289        endif,vpath,subst,patsubst,strip,findstring,filter,filter-out,%
2290        sort,dir,notdir,suffix,basename,addsuffix,addprefix,join,word,%
2291        words,firstword,wildcard,shell,origin,foreach,%
2292        @D,@F,*D,*F,\%D,\%F,<D,<F,^D,^F,+D,+F,?D,?F,%
2293        AR,AS,CC,CXX,CO,CPP,FC,GET,LEX,PC,YACC,YACCR,MAKEINFO,TEXI2DVI,%
2294        WEAVE,CWEAVE,TANGLE,CTANGLE,RM,M2C,LINT,COMPILE,LINK,PREPROCESS,%
2295        CHECKOUT,%
2296        ARFLAGS,ASFLAGS,CFLAGS,CXXFLAGS,COFLAGS,CPPFLAGS,FFLAGS,GFLAGS,%
2297        LDFLAGS,LOADLIBES,LFLAGS,PFLAGS,RFLAGS,YFLAGS,M2FLAGS,MODFLAGS,%
2298        LINTFLAGS,MAKEINFO_FLAGS,TEXI2DVI_FLAGS,COFLAGS,GFLAGS,%
2299        OUTPUT_OPTION,SCCS_OUTPUT_OPTION,% missing comma: Markus Pahlow
2300        .PHONY,.SUFFIXES,.DEFAULT,.PRECIOUS,.INTERMEDIATE,.SECONDARY,%
2301        .IGNORE,.SILENT,.EXPORT_ALL_VARIABLES,MAKEFILES,VPATH,MAKESHELL,%
2302        MAKELEVEL,MAKECMDGOALS,SUFFIXES},%
2303     sensitive=true,
2304     morecomment=[l]\#,%
2305     morestring=[b]"%
2306    }[keywords,comments,strings,make]%
2307 \lst@definelanguage{make}
2308    {morekeywords={SHELL,MAKE,MAKEFLAGS,$@,$\%,$<,$?,$^,$+,$*},%
2309     sensitive=true,%
2310     morecomment=[l]\#,%
2311     morestring=[b]"%
2312    }[keywords,comments,strings,make]%
```

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

2313 ⟨/lang2⟩

## 2.42   Matlab

I 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.

2314 ⟨∗lang1⟩

```
2315 \lst@definelanguage{Matlab}%
2316   {morekeywords={gt,lt,gt,lt,amp,abs,acos,acosh,acot,acoth,acsc,acsch,%
2317       all,angle,ans,any,asec,asech,asin,asinh,atan,atan2,atanh,auread,%
2318       auwrite,axes,axis,balance,bar,bessel,besselk,bessely,beta,%
2319       betainc,betaln,blanks,bone,break,brighten,capture,cart2pol,%
2320       cart2sph,caxis,cd,cdf2rdf,cedit,ceil,chol,cla,clabel,clc,clear,%
2321       clf,clock,close,colmmd,Colon,colorbar,colormap,ColorSpec,colperm,%
2322       comet,comet3,compan,compass,computer,cond,condest,conj,contour,%
2323       contour3,contourc,contrast,conv,conv2,cool,copper,corrcoef,cos,%
2324       cosh,cot,coth,cov,cplxpair,cputime,cross,csc,csch,csvread,%
2325       csvwrite,cumprod,cumsum,cylinder,date,dbclear,dbcont,dbdown,%
2326       dbquit,dbstack,dbstatus,dbstep,dbstop,dbtype,dbup,ddeadv,ddeexec,%
2327       ddeinit,ddepoke,ddereq,ddeterm,ddeunadv,deblank,dec2hex,deconv,%
2328       del2,delete,demo,det,diag,diary,diff,diffuse,dir,disp,dlmread,%
2329       dlmwrite,dmperm,dot,drawnow,echo,eig,ellipj,ellipke,else,elseif,%
2330       end,engClose,engEvalString,engGetFull,engGetMatrix,engOpen,%
2331       engOutputBuffer,engPutFull,engPutMatrix,engSetEvalCallback,%
2332       engSetEvalTimeout,engWinInit,eps,erf,erfc,erfcx,erfinv,error,%
2333       errorbar,etime,etree,eval,exist,exp,expint,expm,expo,eye,fclose,%
2334       feather,feof,ferror,feval,fft,fft2,fftshift,fgetl,fgets,figure,%
2335       fill,fill3,filter,filter2,find,findstr,finite,fix,flag,fliplr,%
2336       flipud,floor,flops,fmin,fmins,fopen,for,format,fplot,fprintf,%
2337       fread,frewind,fscanf,fseek,ftell,full,function,funm,fwrite,fzero,%
2338       gallery,gamma,gammainc,gammaln,gca,gcd,gcf,gco,get,getenv,%
2339       getframe,ginput,global,gplot,gradient,gray,graymon,grid,griddata,%
2340       gtext,hadamard,hankel,help,hess,hex2dec,hex2num,hidden,hilb,hist,%
2341       hold,home,hostid,hot,hsv,hsv2rgb,if,ifft,ifft2,imag,image,%
2342       imagesc,Inf,info,input,int2str,interp1,interp2,interpft,inv,%
2343       invhilb,isempty,isglobal,ishold,isieee,isinf,isletter,isnan,%
2344       isreal,isspace,issparse,isstr,jet,keyboard,kron,lasterr,lcm,%
2345       legend,legendre,length,lin2mu,line,linspace,load,log,log10,log2,%
2346       loglog,logm,logspace,lookfor,lower,ls,lscov,lu,magic,matClose,%
2347       matDeleteMatrix,matGetDir,matGetFp,matGetFull,matGetMatrix,%
2348       matGetNextMatrix,matGetString,matlabrc,matlabroot,matOpen,%
2349       matPutFull,matPutMatrix,matPutString,max,mean,median,menu,mesh,%
2350       meshc,meshgrid,meshz,mexAtExit,mexCallMATLAB,mexdebug,%
2351       mexErrMsgTxt,mexEvalString,mexFunction,mexGetFull,mexGetMatrix,%
2352       mexGetMatrixPtr,mexPrintf,mexPutFull,mexPutMatrix,mexSetTrapFlag,%
2353       min,more,movie,moviein,mu2lin,mxCalloc,mxCopyCharacterToPtr,%
2354       mxCopyComplex16ToPtr,mxCopyInteger4ToPtr,mxCopyPtrToCharacter,%
2355       mxCopyPtrToComplex16,mxCopyPtrToInteger4,mxCopyPtrToReal8,%
2356       mxCopyReal8ToPtr,mxCreateFull,mxCreateSparse,mxCreateString,%
2357       mxFree,mxFreeMatrix,mxGetIr,mxGetJc,mxGetM,mxGetN,mxGetName,%
2358       mxGetNzmax,mxGetPi,mxGetPr,mxGetScalar,mxGetString,mxIsComplex,%
```

```
2359        mxIsFull,mxIsNumeric,mxIsSparse,mxIsString,mxIsTypeDouble,%
2360        mxSetIr,mxSetJc,mxSetM,mxSetN,mxSetName,mxSetNzmax,mxSetPi,%
2361        mxSetPr,NaN,nargchk,nargin,nargout,newplot,nextpow2,nnls,nnz,%
2362        nonzeros,norm,normest,null,num2str,nzmax,ode23,ode45,orient,orth,%
2363        pack,pascal,patch,path,pause,pcolor,pi,pink,pinv,plot,plot3,%
2364        pol2cart,polar,poly,polyder,polyeig,polyfit,polyval,polyvalm,%
2365        pow2,print,printopt,prism,prod,pwd,qr,qrdelete,qrinsert,quad,%
2366        quad8,quit,quiver,qz,rand,randn,randperm,rank,rat,rats,rbbox,%
2367        rcond,real,realmax,realmin,refresh,rem,reset,reshape,residue,%
2368        return,rgb2hsv,rgbplot,rootobject,roots,rose,rosser,rot90,rotate,%
2369        round,rref,rrefmovie,rsf2csf,save,saxis,schur,sec,sech,semilogx,%
2370        semilogy,set,setstr,shading,sign,sin,sinh,size,slice,sort,sound,%
2371        spalloc,sparse,spaugment,spconvert,spdiags,specular,speye,spfun,%
2372        sph2cart,sphere,spinmap,spline,spones,spparms,sprandn,sprandsym,%
2373        sprank,sprintf,spy,sqrt,sqrtm,sscanf,stairs,startup,std,stem,%
2374        str2mat,str2num,strcmp,strings,strrep,strtok,subplot,subscribe,%
2375        subspace,sum,surf,surface,surfc,surfl,surfnorm,svd,symbfact,%
2376        symmmd,symrcm,tan,tanh,tempdir,tempname,terminal,text,tic,title,%
2377        toc,toeplitz,trace,trapz,tril,triu,type,uicontrol,uigetfile,%
2378        uimenu,uiputfile,unix,unwrap,upper,vander,ver,version,view,%
2379        viewmtx,waitforbuttonpress,waterfall,wavread,wavwrite,what,%
2380        whatsnew,which,while,white,whitebg,who,whos,wilkinson,wk1read,%
2381        wk1write,xlabel,xor,ylabel,zeros,zlabel,zoom},%
2382      sensitive,%
2383      morecomment=[l]\%,%
2384      morestring=[m]'%
2385    }[keywords,comments,strings]%

2386 ⟨/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.

```
2387 ⟨*lang1⟩

2388 \lst@definelanguage[11.0]{Mathematica}[5.2]{Mathematica}{%
2389    morekeywords={
2390      "AASTriangle", "AbelianGroup", "Abort", "AbortKernels",%
2391      "AbortProtect", "AbortScheduledTask", "Above", "Abs", "AbsArg",%
2392      "Absolute", "AbsoluteCorrelation", "AbsoluteCorrelationFunction",%
2393      "AbsoluteCurrentValue", "AbsoluteDashing", "AbsoluteFileName",%
2394      "AbsoluteOptions", "AbsolutePointSize", "AbsoluteThickness",%
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4096       CarmichaelLambda,Cell,CellAutoOverwrite,CellBaseline,%
4097       CellBoundingBox,CellBracketOptions,CellContents,CellDingbat,%
4098       CellEditDuplicate,CellElementsBoundingBox,CellElementSpacings,CellEvaluationDuplicate,%
4099       CellFrame,CellFrameColor,CellFrameLabelMargins,CellFrameLabels,%
```

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4100        CellFrameMargins,CellGroup,CellGroupData,CellGrouping,%
4101        CellGroupingRules,CellHorizontalScrolling,CellLabel,CellLabelAutoDelete,%
4102        CellLabelMargins,CellLabelPositioning,CellMargins,CellObject,%
4103        CellOpen,CellPasswords,CellPrint,CellSize,%
4104        CellStyle,CellTags,CellularAutomaton,Center,%
4105        CharacterEncoding,CharacterEncodingsPath,CharacteristicPolynomial,CharacterRange,%
4106        CheckAll,CholeskyDecomposition,Clip,ClipboardNotebook,%
4107        Closed,ClosingAutoSave,CoefficientArrays,CoefficientDomain,%
4108        CofactorExpansion,ColonForm,ColorFunctionScaling,ColorRules,%
4109        ColorSelectorSettings,Column,ColumnAlignments,ColumnLines,%
4110        ColumnsEqual,ColumnSpacings,ColumnWidths,CommonDefaultFormatTypes,%
4111        CompileOptimizations,CompletionsListPacket,Complexes,ComplexityFunction,%
4112        Compose,ComposeSeries,ConfigurationPath,ConjugateTranspose,%
4113        Connect,ConsoleMessage,ConsoleMessagePacket,ConsolePrint,%
4114        ContentsBoundingBox,ContextToFileName,ContinuedFraction,ConversionOptions,%
4115        ConversionRules,ConvertToBitmapPacket,ConvertToPostScript,ConvertToPostScriptPacket,%
4116        Copyable,CoshIntegral,CounterAssignments,CounterBox,%
4117        CounterBoxOptions,CounterEvaluator,CounterFunction,CounterIncrements,%
4118        CounterStyle,CounterStyleMenuListing,CreatePalettePacket,Cross,%
4119        CurrentlySpeakingPacket,Cyan,CylindricalDecomposition,DampingFactor,%
4120        DataRange,Debug,DebugTag,Decimal,%
4121        DedekindEta,DefaultDuplicateCellStyle,DefaultFontProperties,DefaultFormatType,%
4122        DefaultFormatTypeForStyle,DefaultInlineFormatType,DefaultInputFormatType,
4123        DefaultNaturalLanguage,%
4124        DefaultNewCellStyle,DefaultNewInlineCellStyle,DefaultNotebook,DefaultOutputFormatType,%
4125        DefaultStyleDefinitions,DefaultTextFormatType,DefaultTextInlineFormatType,DefaultValues,%
4126        DefineExternal,DegreeLexicographic,DegreeReverseLexicographic,Deletable,%
4127        DeleteContents,DeletionWarning,DelimiterFlashTime,DelimiterMatching,%
4128        Delimiters,DependentVariables,DiacriticalPositioning,DialogLevel,%
4129        DifferenceOrder,DigitCharacter,DigitCount,DiracDelta,%
4130        Direction,DirectoryName,DisableConsolePrintPacket,DiscreteDelta,%
4131        DisplayAnimation,DisplayEndPacket,DisplayFlushImagePacket,DisplayForm,%
4132        DisplayPacket,DisplayRules,DisplaySetSizePacket,DisplayString,%
4133        DivisionFreeRowReduction,DOSTextFormat,DoubleExponential,DoublyInfinite,%
4134        Down,DragAndDrop,DrawHighlighted,DualLinearProgramming,%
4135        DumpGet,DumpSave,Edit,Editable,%
4136        EditButtonSettings,EditCellTagsSettings,EditDefinition,EditIn,%
4137        Element,EliminationOrder,EllipticExpPrime,EllipticNomeQ,%
4138        EllipticReducedHalfPeriods,EllipticThetaPrime,Empty,EnableConsolePrintPacket,%
4139        Encoding,EndAdd,EndDialogPacket,EndFrontEndInteractionPacket,%
4140        EndOfLine,EndOfString,Enter,EnterExpressionPacket,%
4141        EnterTextPacket,EqualColumns,EqualRows,EquatedTo,%
4142        Erfi,ErrorBox,ErrorBoxOptions,ErrorNorm,%
4143        ErrorPacket,ErrorsDialogSettings,Evaluatable,EvaluatePacket,%
4144        EvaluationCell,EvaluationCompletionAction,EvaluationMonitor,EvaluationNotebook,%
4145        Evaluator,EvaluatorNames,EventEvaluator,ExactNumberQ,%
4146        ExactRootIsolation,Except,ExcludedForms,Exists,%
4147        ExitDialog,ExponentPosition,ExponentStep,Export,%
4148        ExportAutoReplacements,ExportPacket,ExportString,ExpressionPacket,%
4149        ExpToTrig,Extension,ExternalCall,ExternalDataCharacterEncoding,%
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4150        Extract,Fail,FEDisableConsolePrintPacket,FEEnableConsolePrintPacket,%
4151        Fibonacci,File,FileFormat,FileInformation,%
4152        FileName,FileNameDialogSettings,FindFit,FindInstance,%
4153        FindMaximum,FindSettings,FitAll,FlushPrintOutputPacket,%
4154        Font,FontColor,FontFamily,FontName,%
4155        FontPostScriptName,FontProperties,FontReencoding,FontSize,%
4156        FontSlant,FontSubstitutions,FontTracking,FontVariations,%
4157        FontWeight,ForAll,FormatRules,FormatTypeAutoConvert,%
4158        FormatValues,FormBox,FormBoxOptions,Forward,%
4159        ForwardBackward,FourierCosTransform,FourierParameters,FourierSinTransform,%
4160        FourierTransform,FractionalPart,FractionBox,FractionBoxOptions,%
4161        FractionLine,FrameBox,FrameBoxOptions,FresnelC,%
4162        FresnelS,FromContinuedFraction,FromDigits,FrontEndExecute,%
4163        FrontEndObject,FrontEndStackSize,FrontEndToken,FrontEndTokenExecute,%
4164        FrontEndVersion,Full,FullAxes,FullSimplify,%
4165        FunctionExpand,FunctionInterpolation,GaussKronrod,GaussPoints,%
4166        GenerateBitmapCaches,GenerateConditions,GeneratedCell,GeneratedParameters,%
4167        Generic,GetBoundingBoxSizePacket,GetContext,GetFileName,%
4168        GetFrontEndOptionsDataPacket,GetLinebreakInformationPacket,%
4169        GetMenusPacket,GetPageBreakInformationPacket,%
4170        Glaisher,GlobalPreferences,GlobalSession,Gradient,%
4171        GraphicsData,GraphicsGrouping,Gray,Green,%
4172        Grid,GridBaseline,GridBox,GridBoxOptions,%
4173        GridCreationSettings,GridDefaultElement,GridFrame,GridFrameMargins,%
4174        GroupPageBreakWithin,HarmonicNumber,Hash,HashTable,%
4175        HeadCompose,HelpBrowserLookup,HelpBrowserNotebook,HelpBrowserSettings,%
4176        HessenbergDecomposition,Hessian,HoldAllComplete,HoldComplete,%
4177        HoldPattern,Horizontal,HorizontalForm,HorizontalScrollPosition,%
4178        HTMLSave,Hypergeometric0F1Regularized,Hypergeometric1F1Regularized,%
4179        Hypergeometric2F1Regularized,%
4180        HypergeometricPFQ,HypergeometricPFQRegularized,HyperlinkCreationSettings,Hyphenation,%
4181        HyphenationOptions,IgnoreCase,ImageCache,ImageCacheValid,%
4182        ImageMargins,ImageOffset,ImageRangeCache,ImageRegion,%
4183        ImageResolution,ImageRotated,ImageSize,Import,%
4184        ImportAutoReplacements,ImportString,IncludeFileExtension,IncludeSingularTerm,%
4185        IndentingNewlineSpacings,IndentMaxFraction,IndexCreationOptions,Inequality,%
4186        InexactNumberQ,InexactNumbers,Inherited,InitializationCell,%
4187        InitializationCellEvaluation,InitializationCellWarning,%
4188        InlineCounterAssignments,InlineCounterIncrements,%
4189        InlineRules,InputAliases,InputAutoFormat,InputAutoReplacements,%
4190        InputGrouping,InputNamePacket,InputNotebook,InputPacket,%
4191        InputSettings,InputStringPacket,InputToBoxFormPacket,InputToInputForm,%
4192        InputToStandardForm,InsertionPointObject,IntegerExponent,IntegerPart,%
4193        Integers,Interactive,Interlaced,InterpolationOrder,%
4194        InterpolationPoints,InterpolationPrecision,InterpretationBox,%
4195        InterpretationBoxOptions,%
4196        InterpretTemplate,InterruptSettings,Interval,IntervalIntersection,%
4197        IntervalMemberQ,IntervalUnion,InverseBetaRegularized,InverseEllipticNomeQ,%
4198        InverseErf,InverseErfc,InverseFourierCosTransform,
4199        InverseFourierSinTransform,%
```

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4200        InverseFourierTransform,InverseGammaRegularized,InverseJacobiCD,%
4201        InverseJacobiCN,%
4202        InverseJacobiCS,InverseJacobiDC,InverseJacobiDN,InverseJacobiDS,%
4203        InverseJacobiNC,InverseJacobiND,InverseJacobiNS,InverseJacobiSC,%
4204        InverseJacobiSD,InverseLaplaceTransform,InverseWeierstrassP,InverseZTransform,%
4205        Jacobian,JacobiCD,JacobiCN,JacobiCS,%
4206        JacobiDC,JacobiDN,JacobiDS,JacobiNC,%
4207        JacobiND,JacobiNS,JacobiSC,JacobiSD,%
4208        JordanDecomposition,K,Khinchin,KleinInvariantJ,%
4209        KroneckerDelta,Language,LanguageCategory,LaplaceTransform,%
4210        Larger,Launch,LayoutInformation,Left,%
4211        LetterCharacter,Lexicographic,LicenseID,LimitsPositioning,%
4212        LimitsPositioningTokens,LinearSolveFunction,LinebreakAdjustments,LineBreakWithin,%
4213        LineForm,LineIndent,LineSpacing,LineWrapParts,%
4214        LinkActivate,LinkClose,LinkConnect,LinkConnectedQ,%
4215        LinkCreate,LinkError,LinkFlush,LinkHost,%
4216        LinkInterrupt,LinkLaunch,LinkMode,LinkObject,%
4217        LinkOpen,LinkOptions,LinkPatterns,LinkProtocol,%
4218        LinkRead,LinkReadHeld,LinkReadyQ,Links,%
4219        LinkWrite,LinkWriteHeld,ListConvolve,ListCorrelate,%
4220        Listen,ListInterpolation,ListQ,LiteralSearch,%
4221        LongestMatch,LongForm,Loopback,LUBackSubstitution,%
4222        LUDecomposition,MachineID,MachineName,MachinePrecision,%
4223        MacintoshSystemPageSetup,Magenta,Magnification,MakeBoxes,%
4224        MakeExpression,MakeRules,Manual,MatchLocalNameQ,%
4225        MathematicaNotation,MathieuC,MathieuCharacteristicA,MathieuCharacteristicB,%
4226        MathieuCharacteristicExponent,MathieuCPrime,MathieuS,MathieuSPrime,%
4227        MathMLForm,MathMLText,MatrixRank,Maximize,%
4228        MaxIterations,MaxPlotPoints,MaxPoints,MaxRecursion,%
4229        MaxStepFraction,MaxSteps,MaxStepSize,Mean,%
4230        Median,MeijerG,MenuPacket,MessageOptions,%
4231        MessagePacket,MessagesNotebook,MetaCharacters,Method,%
4232        MethodOptions,Minimize,MinRecursion,MinSize,%
4233        Mode,ModularLambda,MonomialOrder,MonteCarlo,%
4234        Most,MousePointerNote,MultiDimensional,MultilaunchWarning,%
4235        MultilineFunction,MultiplicativeOrder,Multiplicity,Nand,%
4236        NeedCurrentFrontEndPackagePacket,NeedCurrentFrontEndSymbolsPacket,%
4237        NestedScriptRules,NestWhile,%
4238        NestWhileList,NevilleThetaC,NevilleThetaD,NevilleThetaN,%
4239        NevilleThetaS,Newton,Next,NHoldAll,%
4240        NHoldFirst,NHoldRest,NMaximize,NMinimize,%
4241        NonAssociative,NonPositive,Nor,Norm,%
4242        NormalGrouping,NormalSelection,NormFunction,Notebook,%
4243        NotebookApply,NotebookAutoSave,NotebookClose,NotebookConvert,%
4244        NotebookConvertSettings,NotebookCreate,NotebookCreateReturnObject,NotebookDefault,%
4245        NotebookDelete,NotebookDirectory,NotebookFind,NotebookFindReturnObject,%
4246        NotebookGet,NotebookGetLayoutInformationPacket,NotebookGetMisspellingsPacket,%
4247        NotebookInformation,%
4248        NotebookLocate,NotebookObject,NotebookOpen,NotebookOpenReturnObject,%
4249        NotebookPath,NotebookPrint,NotebookPut,NotebookPutReturnObject,%
```

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4250        NotebookRead,NotebookResetGeneratedCells,Notebooks,NotebookSave,%
4251        NotebookSaveAs,NotebookSelection,NotebookSetupLayoutInformationPacket,%
4252        NotebooksMenu,%
4253        NotebookWrite,NotElement,NProductExtraFactors,NProductFactors,%
4254        NRoots,NSumExtraTerms,NSumTerms,NumberMarks,%
4255        NumberMultiplier,NumberString,NumericFunction,NumericQ,%
4256        NValues,Offset,OLEData,OneStepRowReduction,%
4257        Open,OpenFunctionInspectorPacket,OpenSpecialOptions,OptimizationLevel,%
4258        OptionInspectorSettings,OptionQ,OptionsPacket,OptionValueBox,%
4259        OptionValueBoxOptions,Orange,Ordering,Oscillatory,%
4260        OutputAutoOverwrite,OutputFormData,OutputGrouping,OutputMathEditExpression,%
4261        OutputNamePacket,OutputToOutputForm,OutputToStandardForm,Over,%
4262        Overflow,Overlaps,Overscript,OverscriptBox,%
4263        OverscriptBoxOptions,OwnValues,PadLeft,PadRight,%
4264        PageBreakAbove,PageBreakBelow,PageBreakWithin,PageFooterLines,%
4265        PageFooters,PageHeaderLines,PageHeaders,PalettePath,%
4266        PaperWidth,ParagraphIndent,ParagraphSpacing,ParameterVariables,%
4267        ParentConnect,ParentForm,Parenthesize,PasteBoxFormInlineCells,%
4268        Path,PatternTest,PeriodicInterpolation,Pick,%
4269        Piecewise,PiecewiseExpand,Pink,Pivoting,%
4270        PixelConstrained,Placeholder,Plain,Plot3Matrix,%
4271        PointForm,PolynomialForm,PolynomialReduce,Polynomials,%
4272        PowerModList,Precedence,PreferencesPath,PreserveStyleSheet,%
4273        Previous,PrimaryPlaceholder,Primes,PrincipalValue,%
4274        PrintAction,PrintingCopies,PrintingOptions,PrintingPageRange,%
4275        PrintingStartingPageNumber,PrintingStyleEnvironment,PrintPrecision,%
4276        PrivateCellOptions,%
4277        PrivateEvaluationOptions,PrivateFontOptions,PrivateNotebookOptions,PrivatePaths,%
4278        ProductLog,PromptForm,Purple,Quantile,%
4279        QuasiMonteCarlo,QuasiNewton,RadicalBox,RadicalBoxOptions,%
4280        RandomSeed,RationalFunctions,Rationals,RawData,%
4281        RawMedium,RealBlockForm,Reals,Reap,%
4282        Red,Refine,Refresh,RegularExpression,%
4283        Reinstall,Release,Removed,RenderingOptions,%
4284        RepeatedString,ReplaceList,Rescale,ResetMenusPacket,%
4285        Resolve,ResumePacket,ReturnExpressionPacket,ReturnInputFormPacket,%
4286        ReturnPacket,ReturnTextPacket,Right,Root,%
4287        RootReduce,RootSum,Row,RowAlignments,%
4288        RowBox,RowLines,RowMinHeight,RowsEqual,%
4289        RowSpacings,RSolve,RuleCondition,RuleForm,%
4290        RulerUnits,Saveable,SaveAutoDelete,ScreenRectangle,%
4291        ScreenStyleEnvironment,ScriptBaselineShifts,ScriptLevel,ScriptMinSize,%
4292        ScriptRules,ScriptSizeMultipliers,ScrollingOptions,ScrollPosition,%
4293        Second,SectionGrouping,Selectable,SelectedNotebook,%
4294        Selection,SelectionAnimate,SelectionCell,SelectionCellCreateCell,%
4295        SelectionCellDefaultStyle,SelectionCellParentStyle,SelectionCreateCell,%
4296        SelectionDuplicateCell,%
4297        SelectionEvaluate,SelectionEvaluateCreateCell,SelectionMove,SelectionSetStyle,%
4298        SelectionStrategy,SendFontInformationToKernel,SequenceHold,SequenceLimit,%
4299        SeriesCoefficient,SetBoxFormNamesPacket,SetEvaluationNotebook,%
```

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4300        SetFileLoadingContext,%
4301        SetNotebookStatusLine,SetOptionsPacket,SetSelectedNotebook,%
4302        SetSpeechParametersPacket,%
4303        SetValue,ShortestMatch,ShowAutoStyles,ShowCellBracket,%
4304        ShowCellLabel,ShowCellTags,ShowClosedCellArea,ShowContents,%
4305        ShowCursorTracker,ShowGroupOpenCloseIcon,ShowPageBreaks,ShowSelection,%
4306        ShowShortBoxForm,ShowSpecialCharacters,ShowStringCharacters,%
4307        ShrinkWrapBoundingBox,%
4308        SingleLetterItalics,SingularityDepth,SingularValueDecomposition,%
4309        SingularValueList,%
4310        SinhIntegral,Smaller,Socket,SolveDelayed,%
4311        SoundAndGraphics,Sow,Space,SpaceForm,%
4312        SpanAdjustments,SpanCharacterRounding,SpanLineThickness,SpanMaxSize,%
4313        SpanMinSize,SpanningCharacters,SpanSymmetric,Sparse,%
4314        SparseArray,SpeakTextPacket,SpellingDictionaries,SpellingDictionariesPath,%
4315        SpellingOptions,SpellingSuggestionsPacket,Spherical,Split,%
4316        SqrtBox,SqrtBoxOptions,StandardDeviation,StandardForm,%
4317        StartingStepSize,StartOfLine,StartOfString,StartupSound,%
4318        StepMonitor,StieltjesGamma,StoppingTest,StringCases,%
4319        StringCount,StringExpression,StringFreeQ,StringQ,%
4320        StringReplaceList,StringReplacePart,StringSplit,StripBoxes,%
4321        StripWrapperBoxes,StructuredSelection,StruveH,StruveL,%
4322        StyleBox,StyleBoxAutoDelete,StyleBoxOptions,StyleData,%
4323        StyleDefinitions,StyleForm,StyleMenuListing,StyleNameDialogSettings,%
4324        StylePrint,StyleSheetPath,Subresultants,SubscriptBox,%
4325        SubscriptBoxOptions,Subsets,Subsuperscript,SubsuperscriptBox,%
4326        SubsuperscriptBoxOptions,SubtractFrom,SubValues,SugarCube,%
4327        SuperscriptBox,SuperscriptBoxOptions,SuspendPacket,SylvesterMatrix,%
4328        SymbolName,Syntax,SyntaxForm,SyntaxPacket,%
4329        SystemException,SystemHelpPath,SystemStub,Tab,%
4330        TabFilling,TabSpacings,TagBox,TagBoxOptions,%
4331        TaggingRules,TagStyle,TargetFunctions,TemporaryVariable,%
4332        TensorQ,TeXSave,TextAlignment,TextBoundingBox,%
4333        TextData,TextJustification,TextLine,TextPacket,%
4334        TextParagraph,TextRendering,TextStyle,ThisLink,%
4335        TimeConstraint,TimeVariable,TitleGrouping,ToBoxes,%
4336        ToColor,ToFileName,Toggle,ToggleFalse,%
4337        Tolerance,TooBig,Top,ToRadicals,%
4338        Total,Tr,TraceAction,TraceInternal,%
4339        TraceLevel,TraditionalForm,TraditionalFunctionNotation,TraditionalNotation,%
4340        TraditionalOrder,TransformationFunctions,TransparentColor,Trapezoidal,%
4341        TrigExpand,TrigFactor,TrigFactorList,TrigReduce,%
4342        TrigToExp,Tuples,UnAlias,Underflow,%
4343        Underoverscript,UnderoverscriptBox,UnderoverscriptBoxOptions,Underscript,%
4344        UnderscriptBox,UnderscriptBoxOptions,UndocumentedTestFEParserPacket,%
4345        UndocumentedTestGetSelectionPacket,%
4346        UnitStep,Up,URL,Using,%
4347        V2Get,Value,ValueBox,ValueBoxOptions,%
4348        ValueForm,Variance,Verbatim,Verbose,%
4349        VerboseConvertToPostScriptPacket,VerifyConvergence,VerifySolutions,Version,%
```

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4350        VersionNumber,Vertical,VerticalForm,ViewPointSelectorSettings,%
4351        Visible,VisibleCell,WeierstrassHalfPeriods,WeierstrassInvariants,%
4352        WeierstrassSigma,WeierstrassZeta,White,Whitespace,%
4353        WhitespaceCharacter,WindowClickSelect,WindowElements,WindowFloating,%
4354        WindowFrame,WindowFrameElements,WindowMargins,WindowMovable,%
4355        WindowSize,WindowTitle,WindowToolbars,WindowWidth,%
4356        WordBoundary,WordCharacter,WynnDegree,XMLElement},%
4357    morendkeywords={$,$AddOnsDirectory,$AnimationDisplayFunction,%
4358        $AnimationFunction,%
4359        $Assumptions,$BaseDirectory,$BoxForms,$ByteOrdering,%
4360        $CharacterEncoding,$ConditionHold,$CurrentLink,$DefaultPath,%
4361        $ExportEncodings,$ExportFormats,$FormatType,$FrontEnd,%
4362        $HistoryLength,$HomeDirectory,$ImportEncodings,$ImportFormats,%
4363        $InitialDirectory,$InstallationDate,$InstallationDirectory,%
4364        $InterfaceEnvironment,%
4365        $LaunchDirectory,$LicenseExpirationDate,$LicenseID,$LicenseProcesses,%
4366        $LicenseServer,$MachineDomain,$MaxExtraPrecision,$MaxLicenseProcesses,%
4367        $MaxNumber,$MaxPiecewiseCases,$MaxPrecision,$MaxRootDegree,%
4368        $MinNumber,$MinPrecision,$NetworkLicense,$NumberMarks,%
4369        $Off,$OutputForms,$ParentLink,$ParentProcessID,%
4370        $PasswordFile,$PathnameSeparator,$PreferencesDirectory,$PrintForms,%
4371        $PrintLiteral,$ProcessID,$ProcessorType,$ProductInformation,%
4372        $ProgramName,$PSDirectDisplay,$RandomState,$RasterFunction,%
4373        $RootDirectory,$SetParentLink,$SoundDisplay,$SuppressInputFormHeads,%
4374        $SystemCharacterEncoding,$SystemID,$TemporaryPrefix,$TextStyle,%
4375        $TopDirectory,$TraceOff,$TraceOn,$TracePattern,%
4376        $TracePostAction,$TracePreAction,$UserAddOnsDirectory,$UserBaseDirectory,%
4377        $UserName,Constant,Flat,HoldAll,%
4378        HoldAllComplete,HoldFirst,HoldRest,Listable,%
4379        Locked,NHoldAll,NHoldFirst,NHoldRest,%
4380        NumericFunction,OneIdentity,Orderless,Protected,%
4381        ReadProtected,SequenceHold},%
4382    }%
4383 %%
4384 %% Mathematica definitions (c) 1999 Michael Wiese
4385 %%
4386 \lst@definelanguage[3.0]{Mathematica}[1.0]{Mathematica}%
4387    {morekeywords={Abort,AbortProtect,AbsoluteDashing,AbsolutePointSize,%
4388        AbsoluteThickness,AbsoluteTime,AccountingFormAiry,AiPrime,AiryBi,%
4389        AiryBiPrime,Alternatives,AnchoredSearch,AxesEdge,AxesOrigin,%
4390        AxesStyle,Background,BetaRegularized,BoxStyle,C,CheckAbort,%
4391        Circle,ClebschGordan,CMYKColor,ColorFunction,ColorOutput,Compile,%
4392        Compiled,CompiledFunction,ComplexExpand,ComposeList,Composition,%
4393        ConstrainedMax,ConstrainedMin,Contexts,ContextToFilename,%
4394        ContourLines,Contours,ContourShading,ContourSmoothing,%
4395        ContourStyle,CopyDirectory,CopyFile,CosIntegral,CreateDirectory,%
4396        Cuboid,Date,DeclarePackage,DefaultColor,DefaultFont,Delete,%
4397        DeleteCases,DeleteDirectory,DeleteFile,Dialog,DialogIndent,%
4398        DialogProlog,DialogSymbols,DigitQ,Directory,DirectoryStack,Disk,%
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4399        Dispatch,DownValues,DSolve,Encode,Epilog,Erfc,Evaluate,%
4400        ExponentFunction,FaceGrids,FileByteCount,FileDate,FileNames,%
4401        FileType,Find,FindList,FixedPointList,FlattenAt,Fold,FoldList,%
4402        Frame,FrameLabel,FrameStyle,FrameTicks,FromCharacterCode,%
4403        FromDate,FullGraphics,FullOptions,GammaRegularized,%
4404        GaussianIntegers,GraphicsArray,GraphicsSpacing,GridLines,%
4405        GroebnerBasis,Heads,HeldPart,HomeDirectory,Hue,IgnoreCases,%
4406        InputStream,Install,InString,IntegerDigits,InterpolatingFunction,%
4407        InterpolatingPolynomial,Interpolation,Interrupt,InverseFunction,%
4408        InverseFunctions,JacobiZeta,LetterQ,LinearProgramming,ListPlay,%
4409        LogGamma,LowerCaseQ,MachineNumberQ,MantissaExponent,MapIndexed,%
4410        MapThread,MatchLocalNames,MatrixExp,MatrixPower,MeshRange,%
4411        MeshStyle,MessageList,Module,NDSolve,NSolve,NullRecords,%
4412        NullWords,NumberFormat,NumberPadding,NumberSigns,OutputStream,%
4413        PaddedForm,ParentDirectory,Pause,Play,PlayRange,PlotRegion,%
4414        PolygonIntersections,PolynomialGCD,PolynomialLCM,PolynomialMod,%
4415        PostScript,PowerExpand,PrecisionGoal,PrimePi,Prolog,%
4416        QRDecomposition,Raster,RasterArray,RealDigits,Record,RecordLists,%
4417        RecordSeparators,ReleaseHold,RenameDirectory,RenameFile,%
4418        ReplaceHeldPart,ReplacePart,ResetDirectory,Residue,%
4419        RiemannSiegelTheta,RiemannSiegelZ,RotateLabel,SameTest,%
4420        SampleDepth,SampledSoundFunction,SampledSoundList,SampleRate,%
4421        SchurDecomposition,SessionTime,SetAccuracy,SetDirectory,%
4422        SetFileDate,SetPrecision,SetStreamPosition,Shallow,SignPadding,%
4423        SinIntegral,SixJSymbol,Skip,Sound,SpellingCorrection,%
4424        SphericalRegion,Stack,StackBegin,StackComplete,StackInhibit,%
4425        StreamPosition,Streams,StringByteCount,StringConversion,%
4426        StringDrop,StringInsert,StringPosition,StringReplace,%
4427        StringReverse,StringTake,StringToStream,SurfaceColor,%
4428        SyntaxLength,SyntaxQ,TableAlignments,TableDepth,%
4429        TableDirections,TableHeadings,TableSpacing,ThreeJSymbol,TimeUsed,%
4430        TimeZone,ToCharacterCode,ToDate,ToHeldExpression,TokenWords,%
4431        ToLowerCase,ToUpperCase,Trace,TraceAbove,TraceBackward,%
4432        TraceDepth,TraceDialog,TraceForward,TraceOff,TraceOn,%
4433        TraceOriginal,TracePrint,TraceScan,Trig,Unevaluated,Uninstall,%
4434        UnsameQ,UpperCaseQ,UpValues,ViewCenter,ViewVertical,With,Word,%
4435        WordSearch,WordSeparators},%
4436    morendkeywords={Stub,Temporary,$Aborted,$BatchInput,$BatchOutput,%
4437        $CreationDate,$DefaultFont,$DumpDates,$DumpSupported,$Failed,%
4438        $Input,$Inspector,$IterationLimit,$Language,$Letters,$Linked,%
4439        $LinkSupported,$MachineEpsilon,$MachineID,$MachineName,%
4440        $MachinePrecision,$MachineType,$MaxMachineNumber,$MessageList,%
4441        $MessagePrePrint,$MinMachineNumber,$ModuleNumber,$NewMessage,%
4442        $NewSymbol,$Notebooks,$OperatingSystem,$Packages,$PipeSupported,%
4443        $PreRead,$ReleaseNumber,$SessionID,$SoundDisplayFunction,%
4444        $StringConversion,$StringOrder,$SyntaxHandler,$TimeUnit,%
4445        $VersionNumber}%
4446    }%
4447 \lst@definelanguage[1.0]{Mathematica}%
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4448  {morekeywords={Abs,Accuracy,AccurayGoal,AddTo,AiryAi,AlgebraicRules,%
4449      AmbientLight,And,Apart,Append,AppendTo,Apply,ArcCos,ArcCosh,%
4450      ArcCot,ArcCoth,ArcCsc,ArcCsch,ArcSec,ArcSech,ArcSin,ArcSinh,%
4451      ArcTan,ArcTanh,Arg,ArithmeticGeometricMean,Array,AspectRatio,%
4452      AtomQ,Attributes,Axes,AxesLabel,BaseForm,Begin,BeginPackage,%
4453      BernoulliB,BesselI,BesselJ,BesselK,BesselY,Beta,Binomial,Blank,%
4454      BlankNullSequence,BlankSequence,Block,Boxed,BoxRatios,Break,Byte,%
4455      ByteCount,Cancel,Cases,Catch,Ceiling,CForm,Character,Characters,%
4456      ChebyshevT,ChebyshevU,Check,Chop,Clear,ClearAll,ClearAttributes,%
4457      ClipFill,Close,Coefficient,CoefficientList,Collect,ColumnForm,%
4458      Complement,Complex,CompoundExpression,Condition,Conjugate,%
4459      Constants,Context,Continuation,Continue,ContourGraphics,%
4460      ContourPlot,Cos,Cosh,Cot,Coth,Count,Csc,Csch,Cubics,Cyclotomic,%
4461      D,Dashing,Decompose,Decrement,Default,Definition,Denominator,%
4462      DensityGraphics,DensityPlot,Depth,Derivative,Det,DiagonalMatrix,%
4463      DigitBlock,Dimensions,DirectedInfinity,Display,DisplayFunction,%
4464      Distribute,Divide,DivideBy,Divisors,DivisorSigma,Do,Dot,Drop,Dt,%
4465      Dump,EdgeForm,Eigensystem,Eigenvalues,Eigenvectors,Eliminate,%
4466      EllipticE,EllipticExp,EllipticF,EllipticK,EllipticLog,EllipticPi,%
4467      EllipticTheta,End,EndPackage,EngineeringForm,Environment,Equal,%
4468      Erf,EulerE,EulerPhi,EvenQ,Exit,Exp,Expand,ExpandAll,%
4469      ExpandDenominator,ExpandNumerator,ExpIntegralE,ExpIntegralEi,%
4470      Exponent,Expression,ExtendedGCD,FaceForm,Factor,FactorComplete,%
4471      Factorial,Factorial2,FactorInteger,FactorList,FactorSquareFree,%
4472      FactorSquareFreeList,FactorTerms,FactorTermsList,FindMinimum,%
4473      FindRoot,First,Fit,FixedPoint,Flatten,Floor,FontForm,For,Format,%
4474      FormatType,FortranForm,Fourier,FreeQ,FullDefinition,FullForm,%
4475      Function,Gamma,GCD,GegenbauerC,General,Get,Goto,Graphics,%
4476      Graphics3D,GrayLevel,Greater,GreaterEqual,Head,HermiteH,%
4477      HiddenSurface,Hold,HoldForm,Hypergeometric0F1,Hypergeometric1F1,%
4478      Hypergeometric2F1,HypergeometricU,Identity,IdentityMatrix,If,Im,%
4479      Implies,In,Increment,Indent,Infix,Information,Inner,Input,%
4480      InputForm,InputString,Insert,Integer,IntegerQ,Integrate,%
4481      Intersection,Inverse,InverseFourier,InverseJacobiSN,%
4482      InverseSeries,JacobiAmplitude,JacobiP,JacobiSN,JacobiSymbol,Join,%
4483      Label,LaguerreL,Last,LatticeReduce,LCM,LeafCount,LegendreP,%
4484      LegendreQ,LegendreType,Length,LerchPhi,Less,LessEqual,Level,%
4485      Lighting,LightSources,Limit,Line,LinearSolve,LineBreak,List,%
4486      ListContourPlot,ListDensityPlot,ListPlot,ListPlot3D,Literal,Log,%
4487      LogicalExpand,LogIntegral,MainSolve,Map,MapAll,MapAt,MatchQ,%
4488      MatrixForm,MatrixQ,Max,MaxBend,MaxMemoryUsed,MemberQ,%
4489      MemoryConstrained,MemoryInUse,Mesh,Message,MessageName,Messages,%
4490      Min,Minors,Minus,Mod,Modulus,MoebiusMu,Multinomial,N,NameQ,Names,%
4491      NBernoulliB,Needs,Negative,Nest,NestList,NIntegrate,%
4492      NonCommutativeMultiply,NonConstants,NonNegative,Normal,Not,%
4493      NProduct,NSum,NullSpace,Number,NumberForm,NumberPoint,NumberQ,%
4494      NumberSeparator,Numerator,O,OddQ,Off,On,OpenAppend,OpenRead,%
4495      OpenTemporary,OpenWrite,Operate,Optional,Options,Or,Order,%
4496      OrderedQ,Out,Outer,OutputForm,PageHeight,PageWidth,%
4497      ParametricPlot,ParametricPlot3D,Part,Partition,PartitionsP,%
```

```
4498        PartitionsQ,Pattern,Permutations,Plot,Plot3D,PlotDivision,%
4499        PlotJoined,PlotLabel,PlotPoints,PlotRange,PlotStyle,Pochhammer,%
4500        Plus,Point,PointSize,PolyGamma,Polygon,PolyLog,PolynomialQ,%
4501        PolynomialQuotient,PolynomialRemainder,Position,Positive,Postfix,%
4502        Power,PowerMod,PrecedenceForm,Precision,PreDecrement,Prefix,%
4503        PreIncrement,Prepend,PrependTo,Prime,PrimeQ,Print,PrintForm,%
4504        Product,Protect,PseudoInverse,Put,PutAppend,Quartics,Quit,%
4505        Quotient,Random,Range,Rational,Rationalize,Raw,Re,Read,ReadList,%
4506        Real,Rectangle,Reduce,Remove,RenderAll,Repeated,RepeatedNull,%
4507        Replace,ReplaceAll,ReplaceRepeated,Rest,Resultant,Return,Reverse,%
4508        RGBColor,Roots,RotateLeft,RotateRight,Round,RowReduce,Rule,%
4509        RuleDelayed,Run,RunThrough,SameQ,Save,Scaled,Scan,ScientificForm,%
4510        Sec,Sech,SeedRandom,Select,Sequence,SequenceForm,Series,%
4511        SeriesData,Set,SetAttributes,SetDelayed,SetOptions,Shading,Share,%
4512        Short,Show,Sign,Signature,Simplify,Sin,SingularValues,Sinh,%
4513        Skeleton,Slot,SlotSequence,Solve,SolveAlways,Sort,%
4514        SphericalHarmonicY,Splice,Sqrt,StirlingS1,StirlingS2,String,%
4515        StringBreak,StringForm,StringJoin,StringLength,StringMatchQ,%
4516        StringSkeleton,Subscript,Subscripted,Subtract,SubtractForm,Sum,%
4517        Superscript,SurfaceGraphics,Switch,Symbol,Table,TableForm,TagSet,%
4518        TagSetDelayed,TagUnset,Take,Tan,Tanh,ToString,TensorRank,TeXForm,%
4519        Text,TextForm,Thickness,Thread,Through,Throw,Ticks,%
4520        TimeConstrained,Times,TimesBy,Timing,ToExpression,Together,%
4521        ToRules,ToString,TotalHeight,TotalWidth,Transpose,TreeForm,TrueQ,%
4522        Unequal,Union,Unique,Unprotect,Unset,Update,UpSet,UpSetDelayed,%
4523        ValueQ,Variables,VectorQ,ViewPoint,WeierstrassP,%
4524        WeierstrassPPrime,Which,While,WorkingPrecision,Write,WriteString,%
4525        Xor,ZeroTest,Zeta},%
4526     morendkeywords={All,Automatic,Catalan,ComplexInfinity,Constant,%
4527        Degree,E,EndOfFile,EulerGamma,False,Flat,GoldenRatio,HoldAll,%
4528        HoldFirst,HoldRest,I,Indeterminate,Infinity,Listable,Locked,%
4529        Modular,None,Null,OneIdentity,Orderless,Pi,Protected,%
4530        ReadProtected,True,$CommandLine,$Context,$ContextPath,$Display,%
4531        $DisplayFunction,$Echo,$Epilog,$IgnoreEOF,$Line,$Messages,%
4532        $Output,$Path,$Post,$Pre,$PrePrint,$RecursionLimit,$System,%
4533        $Urgent,$Version},%
4534     sensitive,%
4535     morecomment=[s]{(*}{*)},%
4536     morestring=[d]"%
4537   }[keywords,comments,strings]%

4538 ⟨/lang1⟩
```

## 2.44  Mercury

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

```
4539 ⟨∗lang2⟩

4540 %%
```

```
4541 %% Mercury definition (c) 1997 Dominique de Waleffe
4542 %% Extended (c) 2001 Ralph Becket
4543 %%
4544 \lst@definelanguage{Mercury}%
4545   {otherkeywords={::,->,-->,--->,:-,==,=>,<=,<=>},%
4546    morekeywords={module,include_module,import_module,interface,%
4547        end_module,implementation,mode,is,failure,semidet,nondet,det,%
4548        multi,erroneous,inst,in,out,di,uo,ui,type,typeclass,instance,%
4549        where,with_type,pred,func,lambda,impure,semipure,if,then,else,%
4550        some,all,not,true,fail,pragma,memo,no_inline,inline,loop_check,%
4551        minimal_model,fact_table,type_spec,terminates,does_not_terminate,%
4552        check_termination,promise_only_solution,unsafe_promise_unique,%
4553        source_file,obsolete,import,export,c_header_code,c_code,%
4554        foreign_code,foreign_proc,may_call_mercury,will_not_call_mercury,%
4555        thread_safe,not_thread_safe},%
4556    sensitive=t,%
4557    morecomment=[l]\%,%
4558    morecomment=[s]{/*}{*/},%
4559    morestring=[bd]",%
4560    morestring=[bd]'%
4561   }[keywords,comments,strings]%
4562 ⟨/lang2⟩
```

## 2.45 MetaPost

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

4563 ⟨∗lang3⟩

```
4564 %%
4565 %% MetaPost definition (c) 2004 Brooks Moses
4566 %%    This definition is based on the language specifications
4567 %%    contained in the _User's Manual for Metapost_, with the core
4568 %%    language enhancements that are described in the _Drawing
4569 %%    Graphs with MetaPost_ documentation.
4570 %%
4571 \lst@definelanguage{MetaPost}%
4572   {% keywords[1] = MetaPost primitives (not found in following tables)
4573    morekeywords={end,begingroup,endgroup,beginfig,endfig,def,vardef,%
4574        primary,secondary,tertiary,primarydef,secondarydef,tertiarydef,%
4575        expr,suffix,text,enddef,if,fi,else,elseif,for,forsuffixes,%
4576        forever,endfor,upto,downto,stop,until,tension,controls,on,off,%
4577        btex,etex,within,input},
4578    % keywords[2] = Operators (Tables 6-9 in MetaPost User's manual)
4579    morekeywords=[2]{abs,and,angle,arclength,arctime,ASCII,bbox,bluepart,%
4580        boolean,bot,ceiling,center,char,color,cosd,cutafter,cutbefore,%
4581        cycle,decimal,dir,direction,directionpoint,directiontime,div,%
4582        dotprod,floor,fontsize,greenpart,hex,infont,intersectionpoint,%
4583        intersectiontimes,inverse,known,length,lft,llcorner,lrcorner,%
```

```
4584        makepath,makepen,mexp,mlog,mod,normaldeviate,not,numeric,oct,%
4585        odd,or,pair,path,pen,penoffset,picture,point,postcontrol,%
4586        precontrol,redpart,reverse,rotated,round,rt,scaled,shifted,%
4587        sind,slanted,sqrt,str,string,subpath,substring,top,transform,%
4588        transformed,ulcorner,uniformdeviate,unitvector,unknown,%
4589        urcorner,whatever,xpart,xscaled,xxpart,xypart,ypart,yscaled,%
4590        yxpart,yypart,zscaled,of,reflectedabout,rotatedaround,ulft,urt,%
4591        llft,lrt,readfrom,write,stroked,filled,textual,clipped,bounded,%
4592        pathpart,penpart,dashpart,textpart,fontpart},%
4593    % keywords[3] = Commands (Table 10)
4594    morekeywords=[3]{addto,clip,cutdraw,draw,drawarrow,drawdblarrow,%
4595        fill,filldraw,interim,let,loggingall,newinternal,pickup,%
4596        save,setbounds,shipout,show,showdependencies,showtoken,%
4597        showvariable,special,tracingall,tracingnone,undraw,unfill,%
4598        unfilldraw,to,also,contour,doublepath,withcolor,withpen,%
4599        dashed,randomseed},%
4600    % keywords[4] = Function-Like Macros (Table 11)
4601    morekeywords=[4]{boxit,boxjoin,bpath,buildcycle,circleit,dashpattern,%
4602        decr,dotlabel,dotlabels,drawboxed,drawboxes,drawoptions,%
4603        drawunboxed,fixpos,fixsize,incr,interpath,label,labels,max,min,pic,%
4604        thelabel,z,image},%
4605    % keywords[5] = Internal and Predefined Variables (Tables 3, 4)
4606    morekeywords=[5]{ahangle,ahlength,bboxmargin,charcode,circmargin,%
4607        day,defaultdx,defaultdy,defaultpen,defaultscale,labeloffset,%
4608        linecap,linejoin,miterlimit,month,pausing,prologues,showstopping,%
4609        time,tracingcapsules,tracingchoices,tracingcommands,%
4610        tracingequations,tracinglostchars,tracingmacros,tracingonline,%
4611        tracingoutput,tracingrestores,tracingspecs,tracingstats,%
4612        tracingtitles,truecorners,warningcheck,year},
4613    morekeywords=[5]{background,currentpen,currentpicture,cuttings,%
4614        defaultfont},%
4615    % keywords[6] = Predefined Constants (Table 5)
4616    morekeywords=[6]{beveled,black,blue,bp,butt,cc,cm,dd,ditto,down,%
4617        epsilon,evenly,false,fullcircle,green,halfcircle,identity,%
4618        in,infinity,left,mitered,mm,nullpicture,origin,pc,pencircle,%
4619        pt,quartercircle,red,right,rounded,squared,true,unitsquare,%
4620        up,white,withdots},
4621    sensitive=false,%
4622    alsoother={0123456789$},%
4623    morecomment=[l]\%,%
4624    morestring=[mf]{input\ },%
4625    morestring=[b]"%
4626  }[keywords,comments,strings,mf]%
4627 ⟨/lang3⟩
```

## 2.46   Miranda

Thanks to Peter Bartke for providing the definition.

```
4628 ⟨*lang2⟩
```

```
4629 %%
4630 %% Miranda definition (c) 1998 Peter Bartke
4631 %%
4632 %% Miranda: pure lazy functional language with polymorphic type system,
4633 %%         garbage collection and functions as first class citizens
4634 %%
4635 \lst@definelanguage{Miranda}%
4636   {morekeywords={abstype,div,if,mod,otherwise,readvals,show,type,where,%
4637     with,bool,char,num,sys_message,False,True,Appendfile,Closefile,%
4638     Exit,Stderr,Stdout,System,Tofile,\%include,\%export,\%free,%
4639     \%insert,abs,and,arctan,cjustify,code,concat,const,converse,cos,%
4640     decode,digit,drop,dropwhile,entier,error,exp,filemode,filter,%
4641     foldl,foldl1,foldr,foldr1,force,fst,getenv,hd,hugenum,id,index,%
4642     init,integer,iterate,last,lay,layn,letter,limit,lines,ljustify,%
4643     log,log10,map,map2,max,max2,member,merge,min,min2,mkset,neg,%
4644     numval,or,pi,postfix,product,read,rep,repeat,reverse,rjustify,%
4645     scan,seq,showfloat,shownum,showscaled,sin,snd,sort,spaces,sqrt,%
4646     subtract,sum,system,take,takewhile,tinynum,tl,transpose,undef,%
4647     until,zip2,zip3,zip4,zip5,zip6,zip},%
4648   sensitive,%
4649   morecomment=[l]||,%
4650   morestring=[b]"%
4651   }[keywords,comments,strings]%

4652 ⟨/lang2⟩
```

## 2.47  Mizar

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

```
4653 ⟨*lang3⟩

4654 %%
4655 %% Mizar definition (c) 2003 Adam Grabowski
4656 %%
4657 %% Mizar is freely available at URL www.mizar.org for the Linux x86,
4658 %% Solaris x86, and Windows operating systems.
4659 %%
4660 \lst@definelanguage{Mizar}%
4661   {otherkeywords={->,(\#,\#),.=),\&},%
4662   morekeywords={vocabulary,constructors,$1,$1,$2,$3,$4,$5,$6,$7,$8,%
4663     @proof,according,aggregate,and,antonym,as,associativity,assume,%
4664     asymmetry,attr,be,begin,being,by,canceled,case,cases,cluster,%
4665     clusters,coherence,commutativity,compatibility,connectedness,%
4666     consider,consistency,constructors,contradiction,correctness,def,%
4667     deffunc,define,definition,definitions,defpred,end,environ,equals,%
4668     ex,exactly,existence,for,from,func,given,hence,hereby,holds,%
4669     idempotence,if,iff,implies,involutiveness,irreflexivity,is,it,%
4670     let,means,mode,non,not,notation,now,of,or,otherwise,over,per,%
4671     pred,prefix,projectivity,proof,provided,qua,reconsider,redefine,%
4672     reflexivity,requirements,reserve,scheme,schemes,section,selector,%
```

```
4673        set,st,struct,such,suppose,symmetry,synonym,take,that,the,then,%
4674        theorem,theorems,thesis,thus,to,transitivity,uniqueness,%
4675        vocabulary,where},%
4676     sensitive=t,%
4677     morecomment=[l]::%
4678   }[keywords,comments]%
4679 ⟨/lang3⟩
```

## 2.48   ML

Thanks to Torben Hoffmann for providing the definition.

```
4680 ⟨∗lang2⟩
4681 %%
4682 %% ML definition (c) 1999 Torben Hoffmann
4683 %%
4684 \lst@definelanguage{ML}%
4685   {morekeywords={abstype,and,andalso,as,case,do,datatype,else,end,%
4686        eqtype,exception,fn,fun,functor,handle,if,in,include,infix,%
4687        infixr,let,local,nonfix,of,op,open,orelse,raise,rec,sharing,sig,%
4688        signature,struct,structure,then,type,val,with,withtype,while},%
4689     sensitive,%
4690     morecomment=[n]{(*}{*)},%
4691     morestring=[d]"%
4692   }[keywords,comments,strings]%
4693 ⟨/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.

```
4694 ⟨∗lang3⟩
4695 \lst@definelanguage{Modula-2}%
4696   {morekeywords={AND,ARRAY,BEGIN,BY,CASE,CONST,DIV,DO,ELSE,ELSIF,END,%
4697        EXIT,EXPORT,FOR,FROM,IF,IMPLEMENTATION,IMPORT,IN,MOD,MODULE,NOT,%
4698        OF,OR,POINTER,PROCEDURE,QUALIFIED,RECORD,REPEAT,RETURN,SET,THEN,%
4699        TYPE,UNTIL,VAR,WHILE,WITH,ABS,BITSET,BOOLEAN,CAP,CARDINAL,CHAR,%
4700        CHR,DEC,EXCL,FALSE,FLOAT,HALT,HIGH,INC,INCL,INTEGER,LONGCARD,%
4701        LONGINT,LONGREAL,MAX,MIN,NIL,ODD,ORD,PROC,REAL,SIZE,TRUE,TRUNC,%
4702        VAL,DEFINITION,LOOP},% added keywords due to Peter Bartke 99/07/22
4703     sensitive,%
4704     morecomment=[n]{(*}{*)},%
4705     morestring=[d]',%
4706     morestring=[d]"%
4707   }[keywords,comments,strings]%
4708 ⟨/lang3⟩
```

## 2.50 MuPAD

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

4709 ⟨∗lang3⟩

```
4710 \lst@definelanguage{MuPAD}{%
4711     morekeywords={end,next,break,if,then,elif,else,end_if,case,end_case,%
4712         otherwise,for,from,to,step,downto,in,end_for,while,end_while,%
4713         repeat,until,end_repeat,or,and,not,xor,div,mod,union,minus,%
4714         intersect,subset,proc,begin,end_proc,domain,end_domain,category,%
4715         end_category,axiom,end_axiom,quit,delete,frame},%
4716     morekeywords=[2]{NIL,FAIL,TRUE,FALSE,UNKNOWN,I,RD_INF,RD_NINF,%
4717         RD_NAN,name,local,option,save,inherits,of,do},%
4718     otherkeywords={\%if,?,!,:=,<,>,=,<=,<>,>=,==>,<=>,::,..,...,->,%
4719         @,@@,\$},%
4720     sensitive=true,%
4721     morecomment=[l]{//},%
4722     morecomment=[n]{/*}{*/},%
4723     morestring=[b]",%
4724     morestring=[d]{'}%
4725   }[keywords,comments,strings]
```

4726 ⟨/lang3⟩

## 2.51 NASTRAN

4727 ⟨∗lang3⟩

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

```
4728 \lst@definelanguage{NASTRAN}
4729   {morekeywords={ENDDATA},%
4730     morecomment=[l]$,%
4731     MoreSelectCharTable=%
4732         \lst@CArgX BEGIN\ BULK\relax\lst@CDef{}%
4733         {\lst@ifmode\else \ifnum\lst@length=\z@
4734             \lst@EnterMode{\lst@GPmode}{\lst@modetrue
4735                 \let\lst@currstyle\lst@gkeywords@sty}%
4736          \fi \fi}%
4737         {\ifnum\lst@mode=\lst@GPmode
4738             \lst@XPrintToken \lst@LeaveMode
4739          \fi}%
4740   }[keywords,comments]%
```

4741 ⟨/lang3⟩

## 2.52 Oberon-2

4742 ⟨∗lang3⟩

```
4743 \lst@definelanguage{Oberon-2}%
4744   {morekeywords={ARRAY,BEGIN,BOOLEAN,BY,CASE,CHAR,CONST,DIV,DO,ELSE,%
```

```
4745    ELSIF,END,EXIT,FALSE,FOR,IF,IMPORT,IN,INTEGER,IS,LONGINT,%
4746    LONGREAL,LOOP,MOD,MODULE,NIL,OF,OR,POINTER,PROCEDURE,REAL,RECORD,%
4747    REPEAT,RETURN,SET,SHORTINT,THEN,TO,TRUE,TYPE,UNTIL,VAR,WHILE,%
4748    WITH,ABS,ASH,CAP,CHR,COPY,DEC,ENTIER,EXCL,HALT,INC,INCL,LEN,LONG,%
4749    MAX,MIN,NEW,ODD,ORD,SHORT,SIZE},%
4750  sensitive,%
4751  morecomment=[n]{(*}{*)},%
4752  morestring=[d]',%
4753  morestring=[d]"%
4754  }[keywords,comments,strings]%

4755 ⟨/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`.

This language is due to Achim D. Brucker.

```
4756 ⟨∗lang3⟩

4757 %%
4758 %% OCL definition (c) 2000 Achim D. Brucker
4759 %%
4760 %% You are allowed to use, modify and distribute this code either under
4761 %% the terms of the LPPL (version 1.0 or later) or the GPL (version 2.0
4762 %% or later).
4763 %%
```

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).

```
4764 \lst@definelanguage[decorative]{OCL}[OMG]{OCL}
4765  {otherkeywords={@pre},%
4766   morendkeywords={name,attributes,associatoinEnds,operations,%
4767      supertypes,allSupertypes,allInstances,oclIsKindOf,oclIsTypeOf,%
4768      oclAsType,oclInState,oclIsNew,evaluationType,abs,floor,round,max,%
4769      min,div,mod,size,concat,toUpper,toLower,substring,includes,%
4770      excludes,count,includesAll,exludesAll,isEmpty,notEmpty,sum,%
4771      exists,forAll,isUnique,sortedBy,iterate,union,intersection,%
4772      including,excluding,symmetricDifference,select,reject,collect,%
4773      asSequence,asBag,asSequence,asSet,append,prepend,subSequence,at,%
4774      first,last,true,false,isQuery}%
4775  }%
```

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):

```
4776 \lst@definelanguage[OMG]{OCL}%
4777     {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):

```
4778     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:

```
4779     morekeywords=[3]{Boolean,Integer,Real,String,Set,Sequence,Bag,%
4780         OclType,OclAny,OclExpression,Enumeration,Collection,},%
4781     sensitive=t,%
4782     morecomment=[l]--,%
4783     morestring=[d]'%
4784   }[keywords,comments,strings]%
```

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

```
4785 ⟨/lang3⟩
```

## 2.54   Octave

```
4786 ⟨*lang1⟩
```

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

```
4787 %%
4788 %% Octave definition (c) 2001,2002 Ulrich G. Wortmann
4789 %%
4790 \lst@definelanguage{Octave}%
4791   {morekeywords={gt,lt,amp,abs,acos,acosh,acot,acoth,acsc,acsch,%
4792       all,angle,ans,any,asec,asech,asin,asinh,atan,atan2,atanh,auread,%
4793       auwrite,axes,axis,balance,bar,bessel,besselk,bessely,beta,%
4794       betainc,betaln,blanks,bone,break,brighten,capture,cart2pol,%
4795       cart2sph,caxis,cd,cdf2rdf,cedit,ceil,chol,cla,clabel,clc,clear,%
4796       clf,clock,close,colmmd,Colon,colorbar,colormap,ColorSpec,colperm,%
4797       comet,comet3,compan,compass,computer,cond,condest,conj,contour,%
4798       contour3,contourc,contrast,conv,conv2,cool,copper,corrcoef,cos,%
4799       cosh,cot,coth,cov,cplxpair,cputime,cross,csc,csch,csvread,%
4800       csvwrite,cumprod,cumsum,cylinder,date,dbclear,dbcont,dbdown,%
4801       dbquit,dbstack,dbstatus,dbstep,dbstop,dbtype,dbup,ddeadv,ddeexec,%
4802       ddeinit,ddepoke,ddereq,ddeterm,ddeunadv,deblank,dec2hex,deconv,%
4803       del2,delete,demo,det,diag,diary,diff,diffuse,dir,disp,dlmread,%
4804       dlmwrite,dmperm,dot,drawnow,echo,eig,ellipj,ellipke,else,elseif,%
4805       end,engClose,engEvalString,engGetFull,engGetMatrix,engOpen,%
4806       engOutputBuffer,engPutFull,engPutMatrix,engSetEvalCallback,%
4807       engSetEvalTimeout,engWinInit,eps,erf,erfc,erfcx,erfinv,%
```

```
4808        errorbar,etime,etree,eval,exist,exp,expint,expm,expo,eye,fclose,%
4809        feather,feof,ferror,feval,fft,fft2,fftshift,fgetl,fgets,figure,%
4810        fill,fill3,filter,filter2,find,findstr,finite,fix,flag,fliplr,%
4811        flipud,floor,flops,fmin,fmins,fopen,for,format,fplot,fprintf,%
4812        fread,frewind,fscanf,fseek,ftell,full,function,funm,fwrite,fzero,%
4813        gallery,gamma,gammainc,gammaln,gca,gcd,gcf,gco,get,getenv,%
4814        getframe,ginput,global,gplot,gradient,gray,graymon,grid,griddata,%
4815        gtext,hadamard,hankel,help,hess,hex2dec,hex2num,hidden,hilb,hist,%
4816        hold,home,hostid,hot,hsv,hsv2rgb,if,ifft,ifft2,imag,image,%
4817        imagesc,Inf,info,input,int2str,interp1,interp2,interpft,inv,%
4818        invhilb,isempty,isglobal,ishold,isieee,isinf,isletter,isnan,%
4819        isreal,isspace,issparse,isstr,jet,keyboard,kron,lasterr,lcm,%
4820        legend,legendre,length,lin2mu,line,linspace,load,log,log10,log2,%
4821        loglog,logm,logspace,lookfor,lower,ls,lscov,lu,magic,matClose,%
4822        matDeleteMatrix,matGetDir,matGetFp,matGetFull,matGetMatrix,%
4823        matGetNextMatrix,matGetString,matlabrc,matlabroot,matOpen,%
4824        matPutFull,matPutMatrix,matPutString,max,mean,median,menu,mesh,%
4825        meshc,meshgrid,meshz,mexAtExit,mexCallMATLAB,mexdebug,%
4826        mexErrMsgTxt,mexEvalString,mexFunction,mexGetFull,mexGetMatrix,%
4827        mexGetMatrixPtr,mexPrintf,mexPutFull,mexPutMatrix,mexSetTrapFlag,%
4828        min,more,movie,moviein,mu2lin,mxCalloc,mxCopyCharacterToPtr,%
4829        mxCopyComplex16ToPtr,mxCopyInteger4ToPtr,mxCopyPtrToCharacter,%
4830        mxCopyPtrToComplex16,mxCopyPtrToInteger4,mxCopyPtrToReal8,%
4831        mxCopyReal8ToPtr,mxCreateFull,mxCreateSparse,mxCreateString,%
4832        mxFree,mxFreeMatrix,mxGetIr,mxGetJc,mxGetM,mxGetN,mxGetName,%
4833        mxGetNzmax,mxGetPi,mxGetPr,mxGetScalar,mxGetString,mxIsComplex,%
4834        mxIsFull,mxIsNumeric,mxIsSparse,mxIsString,mxIsTypeDouble,%
4835        mxSetIr,mxSetJc,mxSetM,mxSetN,mxSetName,mxSetNzmax,mxSetPi,%
4836        mxSetPr,NaN,nargchk,nargin,nargout,newplot,nextpow2,nnls,nnz,%
4837        nonzeros,norm,normest,null,num2str,nzmax,ode23,ode45,orient,orth,%
4838        pack,pascal,patch,path,pause,pcolor,pi,pink,pinv,plot,plot3,%
4839        pol2cart,polar,poly,polyder,polyeig,polyfit,polyval,polyvalm,%
4840        pow2,print,printopt,prism,prod,pwd,qr,qrdelete,qrinsert,quad,%
4841        quad8,quit,quiver,qz,rand,randn,randperm,rank,rat,rats,rbbox,%
4842        rcond,real,realmax,realmin,refresh,rem,reset,reshape,residue,%
4843        return,rgb2hsv,rgbplot,rootobject,roots,rose,rosser,rot90,rotate,%
4844        round,rref,rrefmovie,rsf2csf,save,saxis,schur,sec,sech,semilogx,%
4845        semilogy,set,setstr,shading,sign,sin,sinh,size,slice,sort,sound,%
4846        spalloc,sparse,spaugment,spconvert,spdiags,specular,speye,spfun,%
4847        sph2cart,sphere,spinmap,spline,spones,spparms,sprandn,sprandsym,%
4848        sprank,sprintf,spy,sqrt,sqrtm,sscanf,stairs,startup,std,stem,%
4849        str2mat,str2num,strcmp,strings,strrep,strtok,subplot,subscribe,%
4850        subspace,sum,surf,surface,surfc,surfl,surfnorm,svd,symbfact,%
4851        symmmd,symrcm,tan,tanh,tempdir,tempname,terminal,text,tic,title,%
4852        toc,toeplitz,trace,trapz,tril,triu,type,uicontrol,uigetfile,%
4853        uimenu,uiputfile,unix,unwrap,upper,vander,ver,version,view,%
4854        viewmtx,waitforbuttonpress,waterfall,wavread,wavwrite,what,%
4855        whatsnew,which,while,white,whitebg,who,whos,wilkinson,wk1read,%
4856        stderr,stdout,plot,set,endif,wk1write,xlabel,xor,ylabel,zeros,%
4857        zlabel,zoom,endwhile,endfunction,printf,case,switch,otherwise,%
```

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```
4858        system,lsode,endfor,error,ones,oneplot,__gnuplot_set__,do,until},%
4859      sensitive=t,%
4860      morecomment=[l]\#,%
4861      morecomment=[l]\#\#,%
4862      morecomment=[l]\%,%
4863      morestring=[m]',%
4864      morestring=[m]"%
4865    }[keywords,comments,strings]%
```
4866 ⟨/lang1⟩

## 2.55   Oz

4867 ⟨∗lang2⟩

Thanks to Andres Becerra Sandoval for providing this language definition.
```
4868 %%
4869 %% Oz definition (c) Andres Becerra Sandoval
4870 %%
4871 \lst@definelanguage{Oz}%
4872    {morekeywords={andthen,at,attr,case,catch,choice,class,%
4873        cond,declare,define,dis,div,else,elsecase,%
4874        elseif,end,export,fail,false,feat,finally,%
4875        from,fun,functor,if,import,in,local,%
4876        lock,meth,mod,not,of,or,orelse,%
4877        prepare,proc,prop,raise,require,self,skip,%
4878        then,thread,true,try,unit},%
4879      sensitive=true,%
4880      morecomment=[l]{\%},%
4881      morecomment=[s]{/*}{*/},%
4882      morestring=[b]",%
4883      morestring=[d]'%
4884    }[keywords,comments,strings]%
```
4885 ⟨/lang2⟩

## 2.56   Pascal

4886 ⟨∗lang1⟩

Thanks to Andreas Stephan for reporting non-keywords alpha, byte, pack and
unpack.
```
4887 \lst@definelanguage[XSC]{Pascal}[Standard]{Pascal}
4888    {deletekeywords={alfa,byte,pack,unpack},% 1998 Andreas Stephan
4889      morekeywords={dynamic,external,forward,global,module,nil,operator,%
4890        priority,sum,type,use,dispose,mark,page,release,cimatrix,%
4891        cinterval,civector,cmatrix,complex,cvector,dotprecision,imatrix,%
4892        interval,ivector,rmatrix,rvector,string,im,inf,re,sup,chr,comp,%
4893        eof,eoln,expo,image,ival,lb,lbound,length,loc,mant,maxlength,odd,%
4894        ord,pos,pred,round,rval,sign,substring,succ,trunc,ub,ubound}%
4895    }%
4896 \lst@definelanguage[Borland6]{Pascal}[Standard]{Pascal}
4897    {morekeywords={asm,constructor,destructor,implementation,inline,%
```

```
4898          interface,nil,object,shl,shr,string,unit,uses,xor},%
4899      morendkeywords={Abs,Addr,ArcTan,Chr,Concat,Copy,Cos,CSeg,DiskFree,%
4900          DiskSize,DosExitCode,DosVersion,DSeg,EnvCount,EnvStr,Eof,Eoln,%
4901          Exp,FExpand,FilePos,FileSize,Frac,FSearch,GetBkColor,GetColor,%
4902          GetDefaultPalette,GetDriverName,GetEnv,GetGraphMode,GetMaxMode,%
4903          GetMaxX,GetMaxY,GetModeName,GetPaletteSize,GetPixel,GetX,GetY,%
4904          GraphErrorMsg,GraphResult,Hi,ImageSize,InstallUserDriver,%
4905          InstallUserFont,Int,IOResult,KeyPressed,Length,Lo,MaxAvail,%
4906          MemAvail,MsDos,Odd,Ofs,Ord,OvrGetBuf,OvrGetRetry,ParamCount,%
4907          ParamStr,Pi,Pos,Pred,Ptr,Random,ReadKey,Round,SeekEof,SeekEoln,%
4908          Seg,SetAspectRatio,Sin,SizeOf,Sound,SPtr,Sqr,Sqrt,SSeg,Succ,%
4909          Swap,TextHeight,TextWidth,Trunc,TypeOf,UpCase,WhereX,WhereY,%
4910          Append,Arc,Assign,AssignCrt,Bar,Bar3D,BlockRead,BlockWrite,ChDir,%
4911          Circle,ClearDevice,ClearViewPort,Close,CloseGraph,ClrEol,ClrScr,%
4912          Dec,Delay,Delete,DelLine,DetectGraph,Dispose,DrawPoly,Ellipse,%
4913          Erase,Exec,Exit,FillChar,FillEllipse,FillPoly,FindFirst,FindNext,%
4914          FloodFill,Flush,FreeMem,FSplit,GetArcCoords,GetAspectRatio,%
4915          GetDate,GetDefaultPalette,GetDir,GetCBreak,GetFAttr,%
4916          GetFillSettings,GetFTime,GetImage,GetIntVec,GetLineSettings,%
4917          GetMem,GetPalette,GetTextSettings,GetTime,GetVerify,%
4918          GetViewSettings,GoToXY,Halt,HighVideo,Inc,InitGraph,Insert,%
4919          InsLine,Intr,Keep,Line,LineRel,LineTo,LowVideo,Mark,MkDir,Move,%
4920          MoveRel,MoveTo,MsDos,New,NormVideo,NoSound,OutText,OutTextXY,%
4921          OvrClearBuf,OvrInit,OvrInitEMS,OvrSetBuf,PackTime,PieSlice,%
4922          PutImage,PutPixel,Randomize,Rectangle,Release,Rename,%
4923          RestoreCrtMode,RmDir,RunError,Sector,Seek,SetActivePage,%
4924          SetAllPalette,SetBkColor,SetCBreak,SetColor,SetDate,SetFAttr,%
4925          SetFillPattern,SetFillStyle,SetFTime,SetGraphBufSize,%
4926          SetGraphMode,SetIntVec,SetLineStyle,SetPalette,SetRGBPalette,%
4927          SetTextBuf,SetTextJustify,SetTextStyle,SetTime,SetUserCharSize,%
4928          SetVerify,SetViewPort,SetVisualPage,SetWriteMode,Sound,Str,%
4929          SwapVectors,TextBackground,TextColor,TextMode,Truncate,%
4930          UnpackTime,Val,Window}%
4931      }%
4932  \lst@definelanguage[Standard]{Pascal}%
4933      {morekeywords={alfa,and,array,begin,boolean,byte,case,char,const,div,%
4934          do,downto,else,end,false,file,for,function,get,goto,if,in,%
4935          integer,label,maxint,mod,new,not,of,or,pack,packed,page,program,%
4936          put,procedure,read,readln,real,record,repeat,reset,rewrite,set,%
4937          text,then,to,true,type,unpack,until,var,while,with,write,%
4938          writeln},%
4939      sensitive=f,%
4940      morecomment=[s]{(*}{*)},%
4941      morecomment=[s]{\{}{\}},%
4942      morestring=[d]'%
4943      }[keywords,comments,strings]%

4944  ⟨/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'.

4945 ⟨∗lang1⟩

4946 \lst@definelanguage{Perl}%
4947    {morekeywords={abs,accept,alarm,atan2,bind,binmode,bless,caller,%
4948        chdir,chmod,chomp,chop,chown,chr,chroot,close,closedir,connect,%
4949        continue,cos,crypt,dbmclose,dbmopen,defined,delete,die,do,dump,%
4950        each,else,elsif,endgrent,endhostent,endnetent,endprotoent,%
4951        endpwent,endservent,eof,eval,exec,exists,exit,exp,fcntl,fileno,%
4952        flock,for,foreach,fork,format,formline,getc,getgrent,getgrgid,%
4953        getgrnam,gethostbyaddr,gethostbyname,gethostent,getlogin,%
4954        getnetbyaddr,getnetbyname,getnetent,getpeername,getpgrp,%
4955        getppid,getpriority,getprotobyname,getprotobynumber,getprotoent,%
4956        getpwent,getpwnam,getpwuid,getservbyname,getservbyport,%
4957        getservent,getsockname,getsockopt,glob,gmtime,goto,grep,hex,if,%
4958        import,index,int,ioctl,join,keys,kill,last,lc,lcfirst,length,%
4959        link,listen,local,localtime,log,lstat,m,map,mkdir,msgctl,msgget,%
4960        msgrcv,msgsnd,my,next,no,oct,open,opendir,ord,pack,package,pipe,%
4961        pop,pos,print,printf,prototype,push,q,qq,quotemeta,qw,qx,rand,%
4962        read,readdir,readlink,recv,redo,ref,rename,require,reset,return,%
4963        reverse,rewinddir,rindex,rmdir,s,scalar,seek,seekdir,select,%
4964        semctl,semget,semop,send,setgrent,sethostent,setnetent,setpgrp,%
4965        setpriority,setprotoent,setpwent,setservent,setsockopt,shift,%
4966        shmctl,shmget,shmread,shmwrite,shutdown,sin,sleep,socket,%
4967        socketpair,sort,splice,split,sprintf,sqrt,srand,stat,study,sub,%
4968        substr,symlink,syscall,sysopen,sysread,system,syswrite,tell,%
4969        telldir,tie,tied,time,times,tr,truncate,uc,ucfirst,umask,undef,%
4970        unless,unlink,unpack,unshift,untie,until,use,utime,values,vec,%
4971        wait,waitpid,wantarray,warn,while,write,y},%
4972    sensitive,%
4973    morecomment=[l]\#,%
4974    morestring=[b]",%
4975    morestring=[b]',%
4976    MoreSelectCharTable=%
4977        \lst@ReplaceInput{\$\#}{\lst@ProcessOther\$\lst@ProcessOther\#}%
4978    }[keywords,comments,strings]%

4979 ⟨/lang1⟩

## 2.58 PHP

Luca Balzerani sent me this language definition.

4980 ⟨∗lang2⟩

4981 %%
4982 %% PHP definition by Luca Balzerani
4983 %%
4984 \lst@definelanguage{PHP}%

```
4985    {morekeywords={%
4986    %--- core language
4987      <?,?>,::,break,case,continue,default,do,else,%
4988      elseif,for,foreach,if,include,require,phpinfo,%
4989      switch,while,false,FALSE,true,TRUE,%
4990    %--- apache functions
4991      apache_lookup_uri,apache_note,ascii2ebcdic,ebcdic2ascii,%
4992      virtual,apache_child_terminate,apache_setenv,%
4993    %--- array functions
4994      array,array_change_key_case,array_chunk,array_count_values,%
4995      array_filter,array_flip,array_fill,array_intersect,%
4996      array_keys,array_map,array_merge,array_merge_recursive,%
4997      array_pad,array_pop,array_push,array_rand,array_reverse,%
4998      array_shift,array_slice,array_splice,array_sum,array_unique,%
4999      array_values,array_walk,arsort,asort,compact,count,current,each,%
5000      extract,in_array,array_search,key,krsort,ksort,list,natsort,%
5001      next,pos,prev,range,reset,rsort,shuffle,sizeof,sort,uasort,%
5002      usort,%
5003    %--- aspell functions
5004      aspell_new,aspell_check,aspell_check_raw,aspell_suggest,%
5005    %--- bc functions
5006      bcadd,bccomp,bcdiv,bcmod,bcmul,bcpow,bcscale,bcsqrt,bcsub,%
5007    %--- bzip2 functions
5008      bzclose,bzcompress,bzdecompress,bzerrno,bzerror,bzerrstr,%
5009      bzopen,bzread,bzwrite,%
5010    %--- calendar functions
5011      JDToGregorian,GregorianToJD,JDToJulian,JulianToJD,JDToJewish,%
5012      JDToFrench,FrenchToJD,JDMonthName,JDDayOfWeek,easter_date,%
5013      unixtojd,jdtounix,cal_days_in_month,cal_to_jd,cal_from_jd,%
5014    %--- ccvs functions
5015      ccvs_init,ccvs_done,ccvs_new,ccvs_add,ccvs_delete,ccvs_auth,%
5016      ccvs_reverse,ccvs_sale,ccvs_void,ccvs_status,ccvs_count,%
5017      ccvs_report,ccvs_command,ccvs_textvalue,%
5018    %--- classobj functions
5019      call_user_method,call_user_method_array,class_exists,get_class,%
5020      get_class_vars,get_declared_classes,get_object_vars,%
5021      is_a,is_subclass_of,method_exists,%
5022    %--- com functions
5023      COM,VARIANT,com_load,com_invoke,com_propget,com_get,com_propput,%
5024      com_set,com_addref,com_release,com_isenum,com_load_typelib,%
5025    %--- cpdf functions
5026      cpdf_add_annotation,cpdf_add_outline,cpdf_arc,cpdf_begin_text,%
5027      cpdf_clip,cpdf_close,cpdf_closepath,cpdf_closepath_fill_stroke,%
5028      cpdf_continue_text,cpdf_curveto,cpdf_end_text,cpdf_fill,%
5029      cpdf_finalize,cpdf_finalize_page,%
5030      cpdf_import_jpeg,cpdf_lineto,cpdf_moveto,cpdf_newpath,cpdf_open,%
5031      cpdf_page_init,cpdf_place_inline_image,cpdf_rect,cpdf_restore,%
5032      cpdf_rmoveto,cpdf_rotate,cpdf_rotate_text,cpdf_save,%
5033      cpdf_scale,cpdf_set_char_spacing,cpdf_set_creator,%
5034      cpdf_set_font,cpdf_set_horiz_scaling,cpdf_set_keywords,%
```

```
5035       cpdf_set_page_animation,cpdf_set_subject,cpdf_set_text_matrix,%
5036       cpdf_set_text_rendering,cpdf_set_text_rise,cpdf_set_title,%
5037       cpdf_setdash,cpdf_setflat,cpdf_setgray,cpdf_setgray_fill,%
5038       cpdf_setlinecap,cpdf_setlinejoin,cpdf_setlinewidth,%
5039       cpdf_setrgbcolor,cpdf_setrgbcolor_fill,cpdf_setrgbcolor_stroke,%
5040       cpdf_show_xy,cpdf_stringwidth,cpdf_set_font_directories,%
5041       cpdf_set_viewer_preferences,cpdf_stroke,cpdf_text,%
5042       cpdf_set_action_url,%
5043    %--- crack functions
5044       crack_opendict,crack_closedict,crack_check,crack_getlastmessage,%
5045    %--- ctype functions
5046       ctype_alnum,ctype_alpha,ctype_cntrl,ctype_digit,ctype_lower,%
5047       ctype_print,ctype_punct,ctype_space,ctype_upper,ctype_xdigit,%
5048    %--- curl functions
5049       curl_init,curl_setopt,curl_exec,curl_close,curl_version,%
5050       curl_error,curl_getinfo,%
5051    %--- cybercash functions
5052       cybercash_encr,cybercash_decr,cybercash_base64_encode,%
5053    %--- cybermut functions
5054       cybermut_creerformulairecm,cybermut_testmac,%
5055    %--- cyrus functions
5056       cyrus_connect,cyrus_authenticate,cyrus_bind,cyrus_unbind,%
5057       cyrus_close,%
5058    %--- datetime functions
5059       checkdate,date,getdate,gettimeofday,gmdate,gmmktime,gmstrftime,%
5060       microtime,mktime,strftime,time,strtotime,%
5061    %--- dbase functions
5062       dbase_create,dbase_open,dbase_close,dbase_pack,dbase_add_record,%
5063       dbase_delete_record,dbase_get_record,%
5064       dbase_numfields,dbase_numrecords,%
5065    %--- dba functions
5066       dba_close,dba_delete,dba_exists,dba_fetch,dba_firstkey,%
5067       dba_nextkey,dba_popen,dba_open,dba_optimize,dba_replace,%
5068    %--- dbm functions
5069       dbmopen,dbmclose,dbmexists,dbmfetch,dbminsert,dbmreplace,%
5070       dbmfirstkey,dbmnextkey,dblist,%
5071    %--- dbx functions
5072       dbx_close,dbx_connect,dbx_error,dbx_query,dbx_sort,dbx_compare,%
5073    %--- dio functions
5074       dio_open,dio_read,dio_write,dio_truncate,dio_stat,dio_seek,%
5075       dio_close,%
5076    %--- dir functions
5077       chroot,chdir,dir,closedir,getcwd,opendir,readdir,rewinddir,%
5078    %--- dotnet functions
5079       dotnet_load,%
5080    %--- errorfunc functions
5081       error_log,error_reporting,restore_error_handler,%
5082       trigger_error,user_error,%
5083    %--- exec functions
5084       escapeshellarg,escapeshellcmd,exec,passthru,system,shell_exec,%
```

```
5085    %--- fbsql functions
5086      fbsql_affected_rows,fbsql_autocommit,fbsql_change_user,%
5087      fbsql_commit,fbsql_connect,fbsql_create_db,fbsql_create_blob,%
5088      fbsql_database_password,fbsql_data_seek,fbsql_db_query,%
5089      fbsql_drop_db,fbsql_errno,fbsql_error,fbsql_fetch_array,%
5090      fbsql_fetch_field,fbsql_fetch_lengths,fbsql_fetch_object,%
5091      fbsql_field_flags,fbsql_field_name,fbsql_field_len,%
5092      fbsql_field_table,fbsql_field_type,fbsql_free_result,%
5093      fbsql_list_dbs,fbsql_list_fields,fbsql_list_tables,%
5094      fbsql_num_fields,fbsql_num_rows,fbsql_pconnect,fbsql_query,%
5095      fbsql_read_clob,fbsql_result,fbsql_rollback,fbsql_set_lob_mode,%
5096      fbsql_start_db,fbsql_stop_db,fbsql_tablename,fbsql_warnings,%
5097      fbsql_get_autostart_info,fbsql_hostname,fbsql_password,%
5098      fbsql_username,%
5099    %--- fdf functions
5100      fdf_open,fdf_close,fdf_create,fdf_save,fdf_get_value,%
5101      fdf_next_field_name,fdf_set_ap,fdf_set_status,fdf_get_status,%
5102      fdf_get_file,fdf_set_flags,fdf_set_opt,%
5103      fdf_set_javascript_action,fdf_set_encoding,fdf_add_template,%
5104    %--- filepro functions
5105      filepro,filepro_fieldname,filepro_fieldtype,filepro_fieldwidth,%
5106      filepro_fieldcount,filepro_rowcount,%
5107    %--- filesystem functions
5108      basename,chgrp,chmod,chown,clearstatcache,copy,delete,dirname,%
5109      diskfreespace,disk_total_space,fclose,feof,fflush,fgetc,fgetcsv,%
5110      fgetss,file_get_contents,file,file_exists,fileatime,filectime,%
5111      fileinode,filemtime,fileowner,fileperms,filesize,filetype,flock,%
5112      fopen,fpassthru,fputs,fread,fscanf,fseek,fstat,ftell,ftruncate,%
5113      set_file_buffer,is_dir,is_executable,is_file,is_link,%
5114      is_writable,is_writeable,is_uploaded_file,link,linkinfo,mkdir,%
5115      parse_ini_file,pathinfo,pclose,popen,readfile,readlink,rename,%
5116      rmdir,stat,lstat,realpath,symlink,tempnam,tmpfile,touch,umask,%
5117    %--- fribidi functions
5118      fribidi_log2vis,%
5119    %--- ftp functions
5120      ftp_connect,ftp_login,ftp_pwd,ftp_cdup,ftp_chdir,ftp_mkdir,%
5121      ftp_nlist,ftp_rawlist,ftp_systype,ftp_pasv,ftp_get,ftp_fget,%
5122      ftp_fput,ftp_size,ftp_mdtm,ftp_rename,ftp_delete,ftp_site,%
5123      ftp_quit,ftp_exec,ftp_set_option,ftp_get_option,%
5124    %--- funchand functions
5125      call_user_func_array,call_user_func,create_function,%
5126      func_get_args,func_num_args,function_exists,%
5127      register_shutdown_function,register_tick_function,%
5128    %--- gettext functions
5129      bindtextdomain,bind_textdomain_codeset,dcgettext,dcngettext,%
5130      dngettext,gettext,ngettext,textdomain,%
5131    %--- gmp functions
5132      gmp_init,gmp_intval,gmp_strval,gmp_add,gmp_sub,gmp_mul,%
5133      gmp_div_r,gmp_div_qr,gmp_div,gmp_mod,gmp_divexact,gmp_cmp,%
5134      gmp_com,gmp_abs,gmp_sign,gmp_fact,gmp_sqrt,gmp_sqrtrm,%
```

```
5135    gmp_pow,gmp_powm,gmp_prob_prime,gmp_gcd,gmp_gcdext,gmp_invert,%
5136    gmp_jacobi,gmp_random,gmp_and,gmp_or,gmp_xor,gmp_setbit,%
5137    gmp_scan0,gmp_scan1,gmp_popcount,gmp_hamdist,%
5138  %--- http functions
5139    header,headers_sent,setcookie,%
5140  %--- hw functions
5141    hw_Array2Objrec,hw_Children,hw_ChildrenObj,hw_Close,hw_Connect,%
5142    hw_Deleteobject,hw_DocByAnchor,hw_DocByAnchorObj,%
5143    hw_Document_BodyTag,hw_Document_Content,hw_Document_SetContent,%
5144    hw_ErrorMsg,hw_EditText,hw_Error,hw_Free_Document,hw_GetParents,%
5145    hw_GetChildColl,hw_GetChildCollObj,hw_GetRemote,%
5146    hw_GetSrcByDestObj,hw_GetObject,hw_GetAndLock,hw_GetText,%
5147    hw_GetObjectByQueryObj,hw_GetObjectByQueryColl,%
5148    hw_GetChildDocColl,hw_GetChildDocCollObj,hw_GetAnchors,%
5149    hw_Mv,hw_Identify,hw_InCollections,hw_Info,hw_InsColl,hw_InsDoc,%
5150    hw_InsertObject,hw_mapid,hw_Modifyobject,hw_New_Document,%
5151    hw_Output_Document,hw_pConnect,hw_PipeDocument,hw_Root,%
5152    hw_Who,hw_getusername,hw_stat,hw_setlinkroot,hw_connection_info,%
5153    hw_insertanchors,hw_getrellink,hw_changeobject,%
5154  %--- ibase functions
5155    ibase_connect,ibase_pconnect,ibase_close,ibase_query,%
5156    ibase_fetch_row,ibase_fetch_object,ibase_field_info,%
5157    ibase_free_result,ibase_prepare,ibase_execute,ibase_trans,%
5158    ibase_rollback,ibase_timefmt,ibase_num_fields,ibase_blob_add,%
5159    ibase_blob_close,ibase_blob_create,ibase_blob_echo,%
5160    ibase_blob_import,ibase_blob_info,ibase_blob_open,%
5161  %--- icap functions
5162    icap_open,icap_close,icap_fetch_event,icap_list_events,%
5163    icap_delete_event,icap_snooze,icap_list_alarms,%
5164    icap_rename_calendar,icap_delete_calendar,icap_reopen,%
5165  %--- iconv functions
5166    iconv,iconv_get_encoding,iconv_set_encoding,ob_iconv_handler,%
5167  %--- ifx functions
5168    ifx_connect,ifx_pconnect,ifx_close,ifx_query,ifx_prepare,ifx_do,%
5169    ifx_errormsg,ifx_affected_rows,ifx_getsqlca,ifx_fetch_row,%
5170    ifx_fieldtypes,ifx_fieldproperties,ifx_num_fields,ifx_num_rows,%
5171    ifx_create_char,ifx_free_char,ifx_update_char,ifx_get_char,%
5172    ifx_copy_blob,ifx_free_blob,ifx_get_blob,ifx_update_blob,%
5173    ifx_textasvarchar,ifx_byteasvarchar,ifx_nullformat,%
5174    ifxus_free_slob,ifxus_close_slob,ifxus_open_slob,%
5175    ifxus_seek_slob,ifxus_read_slob,ifxus_write_slob,%
5176  %--- iisfunc functions
5177    iis_get_server_by_path,iis_get_server_by_comment,iis_add_server,%
5178    iis_set_dir_security,iis_get_dir_security,iis_set_server_rights,%
5179    iis_set_script_map,iis_get_script_map,iis_set_app_settings,%
5180    iis_stop_server,iis_stop_service,iis_start_service,%
5181  %--- image functions
5182    exif_imagetype,exif_read_data,exif_thumbnail,getimagesize,%
5183    imagealphablending,imagearc,imagefilledarc,imageellipse,%
5184    imagechar,imagecharup,imagecolorallocate,imagecolordeallocate,%
```

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5185    imagecolorclosest,imagecolorclosestalpha,imagecolorclosestthwb,%
5186    imagecolorexactalpha,imagecolorresolve,imagecolorresolvealpha,%
5187    imagecolorset,imagecolorsforindex,imagecolorstotal,%
5188    imagecopy,imagecopymerge,imagecopymergegray,imagecopyresized,%
5189    imagecreate,imagecreatetruecolor,imagetruecolortopalette,%
5190    imagecreatefromgd2,imagecreatefromgd2part,imagecreatefromgif,%
5191    imagecreatefrompng,imagecreatefromwbmp,imagecreatefromstring,%
5192    imagecreatefromxpm,imagedashedline,imagedestroy,imagefill,%
5193    imagefilledrectangle,imagefilltoborder,imagefontheight,%
5194    imagegd,imagegd2,imagegif,imagepng,imagejpeg,imagewbmp,%
5195    imageline,imageloadfont,imagepalettecopy,imagepolygon,%
5196    imagepsencodefont,imagepsfreefont,imagepsloadfont,%
5197    imagepsslantfont,imagepstext,imagerectangle,imagesetpixel,%
5198    imagesetstyle,imagesettile,imagesetthickness,imagestring,%
5199    imagesx,imagesy,imagettfbbox,imageftbbox,imagettftext,%
5200    imagetypes,jpeg2wbmp,png2wbmp,iptcembed,read_exif_data,%
5201    %--- imap functions
5202    imap_8bit,imap_alerts,imap_append,imap_base64,imap_binary,%
5203    imap_bodystruct,imap_check,imap_clearflag_full,imap_close,%
5204    imap_delete,imap_deletemailbox,imap_errors,imap_expunge,%
5205    imap_fetchbody,imap_fetchheader,imap_fetchstructure,%
5206    imap_getmailboxes,imap_getsubscribed,imap_header,%
5207    imap_headers,imap_last_error,imap_listmailbox,%
5208    imap_mail,imap_mail_compose,imap_mail_copy,imap_mail_move,%
5209    imap_mime_header_decode,imap_msgno,imap_num_msg,imap_num_recent,%
5210    imap_ping,imap_popen,imap_qprint,imap_renamemailbox,imap_reopen,%
5211    imap_rfc822_parse_headers,imap_rfc822_write_address,%
5212    imap_search,imap_setacl,imap_set_quota,imap_setflag_full,%
5213    imap_status,imap_subscribe,imap_uid,imap_undelete,%
5214    imap_utf7_decode,imap_utf7_encode,imap_utf8,imap_thread,%
5215    %--- info functions
5216    assert,assert_options,extension_loaded,dl,getenv,get_cfg_var,%
5217    get_defined_constants,get_extension_funcs,getmygid,%
5218    get_loaded_extensions,get_magic_quotes_gpc,%
5219    getlastmod,getmyinode,getmypid,getmyuid,get_required_files,%
5220    ini_alter,ini_get,ini_get_all,ini_restore,ini_set,phpcredits,%
5221    phpversion,php_logo_guid,php_sapi_name,php_uname,putenv,%
5222    set_time_limit,version_compare,zend_logo_guid,zend_version,%
5223    %--- ircg functions
5224    ircg_pconnect,ircg_fetch_error_msg,ircg_set_current,ircg_join,%
5225    ircg_msg,ircg_notice,ircg_nick,ircg_topic,ircg_channel_mode,%
5226    ircg_whois,ircg_kick,ircg_ignore_add,ircg_ignore_del,%
5227    ircg_is_conn_alive,ircg_lookup_format_messages,%
5228    ircg_set_on_die,ircg_set_file,ircg_get_username,%
5229    ircg_nickname_unescape,%
5230    %--- java functions
5231    java_last_exception_clear,java_last_exception_get,%
5232    %--- ldap functions
5233    ldap_add,ldap_bind,ldap_close,ldap_compare,ldap_connect,%
5234    ldap_delete,ldap_dn2ufn,ldap_err2str,ldap_errno,ldap_error,%
```

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5235    ldap_first_attribute,ldap_first_entry,ldap_free_result,%
5236    ldap_get_dn,ldap_get_entries,ldap_get_option,ldap_get_values,%
5237    ldap_list,ldap_modify,ldap_mod_add,ldap_mod_del,%
5238    ldap_next_attribute,ldap_next_entry,ldap_read,ldap_rename,%
5239    ldap_set_option,ldap_unbind,ldap_8859_to_t61,%
5240    ldap_next_reference,ldap_parse_reference,ldap_parse_result,%
5241    ldap_sort,ldap_start_tls,ldap_t61_to_8859,%
5242  %--- mail functions
5243    mail,ezmlm_hash,%
5244  %--- math functions
5245    abs,acos,acosh,asin,asinh,atan,atanh,atan2,base_convert,bindec,%
5246    cos,cosh,decbin,dechex,decoct,deg2rad,exp,expm1,floor,%
5247    hexdec,hypot,is_finite,is_infinite,is_nan,lcg_value,log,log10,%
5248    max,min,mt_rand,mt_srand,mt_getrandmax,number_format,octdec,pi,%
5249    rad2deg,rand,round,sin,sinh,sqrt,srand,tan,tanh,%
5250  %--- mbstring functions
5251    mb_language,mb_parse_str,mb_internal_encoding,mb_http_input,%
5252    mb_detect_order,mb_substitute_character,mb_output_handler,%
5253    mb_strlen,mb_strpos,mb_strrpos,mb_substr,mb_strcut,mb_strwidth,%
5254    mb_convert_encoding,mb_detect_encoding,mb_convert_kana,%
5255    mb_decode_mimeheader,mb_convert_variables,%
5256    mb_decode_numericentity,mb_send_mail,mb_get_info,%
5257    mb_ereg,mb_eregi,mb_ereg_replace,mb_eregi_replace,mb_split,%
5258    mb_ereg_search,mb_ereg_search_pos,mb_ereg_search_regs,%
5259    mb_ereg_search_getregs,mb_ereg_search_getpos,%
5260  %--- mcal functions
5261    mcal_open,mcal_popen,mcal_reopen,mcal_close,%
5262    mcal_rename_calendar,mcal_delete_calendar,mcal_fetch_event,%
5263    mcal_append_event,mcal_store_event,mcal_delete_event,%
5264    mcal_list_alarms,mcal_event_init,mcal_event_set_category,%
5265    mcal_event_set_description,mcal_event_set_start,%
5266    mcal_event_set_alarm,mcal_event_set_class,mcal_is_leap_year,%
5267    mcal_date_valid,mcal_time_valid,mcal_day_of_week,%
5268    mcal_date_compare,mcal_next_recurrence,%
5269    mcal_event_set_recur_daily,mcal_event_set_recur_weekly,%
5270    mcal_event_set_recur_monthly_wday,mcal_event_set_recur_yearly,%
5271    mcal_event_add_attribute,mcal_expunge,mcal_week_of_year,%
5272  %--- mcrypt functions
5273    mcrypt_get_cipher_name,mcrypt_get_block_size,%
5274    mcrypt_create_iv,mcrypt_cbc,mcrypt_cfb,mcrypt_ecb,mcrypt_ofb,%
5275    mcrypt_list_modes,mcrypt_get_iv_size,mcrypt_encrypt,%
5276    mcrypt_module_open,mcrypt_module_close,mcrypt_generic_deinit,%
5277    mcrypt_generic,mdecrypt_generic,mcrypt_generic_end,%
5278    mcrypt_enc_is_block_algorithm_mode,%
5279    mcrypt_enc_is_block_mode,mcrypt_enc_get_block_size,%
5280    mcrypt_enc_get_supported_key_sizes,mcrypt_enc_get_iv_size,%
5281    mcrypt_enc_get_modes_name,mcrypt_module_self_test,%
5282    mcrypt_module_is_block_algorithm,mcrypt_module_is_block_mode,%
5283    mcrypt_module_get_algo_key_size,%
5284  %--- mhash functions
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5285    mhash_get_hash_name,mhash_get_block_size,mhash_count,mhash,%
5286  %--- misc functions
5287    connection_aborted,connection_status,connection_timeout,%
5288    define,defined,die,eval,exit,get_browser,highlight_file,%
5289    ignore_user_abort,iptcparse,leak,pack,show_source,sleep,uniqid,%
5290    usleep,%
5291  %--- mnogosearch functions
5292    udm_add_search_limit,udm_alloc_agent,udm_api_version,%
5293    udm_cat_list,udm_clear_search_limits,udm_errno,udm_error,%
5294    udm_free_agent,udm_free_ispell_data,udm_free_res,%
5295    udm_get_res_field,udm_get_res_param,udm_load_ispell_data,%
5296    udm_check_charset,udm_check_stored,udm_close_stored,udm_crc32,%
5297  %--- msession functions
5298    msession_connect,msession_disconnect,msession_count,%
5299    msession_destroy,msession_lock,msession_unlock,msession_set,%
5300    msession_uniq,msession_randstr,msession_find,msession_list,%
5301    msession_set_array,msession_listvar,msession_timeout,%
5302    msession_getdata,msession_setdata,msession_plugin,%
5303  %--- msql functions
5304    msql,msql_affected_rows,msql_close,msql_connect,msql_create_db,%
5305    msql_data_seek,msql_dbname,msql_drop_db,msql_dropdb,msql_error,%
5306    msql_fetch_field,msql_fetch_object,msql_fetch_row,%
5307    msql_field_seek,msql_fieldtable,msql_fieldtype,msql_fieldflags,%
5308    msql_free_result,msql_freeresult,msql_list_fields,%
5309    msql_list_dbs,msql_listdbs,msql_list_tables,msql_listtables,%
5310    msql_num_rows,msql_numfields,msql_numrows,msql_pconnect,%
5311    msql_regcase,msql_result,msql_select_db,msql_selectdb,%
5312  %--- mssql functions
5313    mssql_close,mssql_connect,mssql_data_seek,mssql_fetch_array,%
5314    mssql_fetch_object,mssql_fetch_row,mssql_field_length,%
5315    mssql_field_seek,mssql_field_type,mssql_free_result,%
5316    mssql_min_error_severity,mssql_min_message_severity,%
5317    mssql_num_fields,mssql_num_rows,mssql_pconnect,mssql_query,%
5318    mssql_select_db,mssql_bind,mssql_execute,mssql_fetch_assoc,%
5319    mssql_guid_string,mssql_init,mssql_rows_affected,%
5320  %--- muscat functions
5321    muscat_setup,muscat_setup_net,muscat_give,muscat_get,%
5322  %--- mysql functions
5323    mysql_affected_rows,mysql_change_user,mysql_character_set_name,%
5324    mysql_connect,mysql_create_db,mysql_data_seek,mysql_db_name,%
5325    mysql_drop_db,mysql_errno,mysql_error,mysql_escape_string,%
5326    mysql_fetch_assoc,mysql_fetch_field,mysql_fetch_lengths,%
5327    mysql_fetch_row,mysql_field_flags,mysql_field_name,%
5328    mysql_field_seek,mysql_field_table,mysql_field_type,%
5329    mysql_info,mysql_insert_id,mysql_list_dbs,mysql_list_fields,%
5330    mysql_list_tables,mysql_num_fields,mysql_num_rows,%
5331    mysql_ping,mysql_query,mysql_unbuffered_query,%
5332    mysql_result,mysql_select_db,mysql_tablename,mysql_thread_id,%
5333    mysql_get_host_info,mysql_get_proto_info,mysql_get_server_info,%
5334  %--- network functions
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5335     checkdnsrr,closelog,debugger_off,debugger_on,%
5336     fsockopen,gethostbyaddr,gethostbyname,gethostbynamel,getmxrr,%
5337     getprotobynumber,getservbyname,getservbyport,ip2long,long2ip,%
5338     pfsockopen,socket_get_status,socket_set_blocking,%
5339     syslog,%
5340  %--- nis functions
5341     yp_get_default_domain,yp_order,yp_master,yp_match,yp_first,%
5342     yp_errno,yp_err_string,yp_all,yp_cat,%
5343  %--- oci8 functions
5344     OCIDefineByName,OCIBindByName,OCILogon,OCIPLogon,OCINLogon,%
5345     OCIExecute,OCICommit,OCIRollback,OCINewDescriptor,OCIRowCount,%
5346     OCIResult,OCIFetch,OCIFetchInto,OCIFetchStatement,%
5347     OCIColumnName,OCIColumnSize,OCIColumnType,OCIServerVersion,%
5348     OCINewCursor,OCIFreeStatement,OCIFreeCursor,OCIFreeDesc,%
5349     OCIError,OCIInternalDebug,OCICancel,OCISetPrefetch,%
5350     OCISaveLobFile,OCISaveLob,OCILoadLob,OCIColumnScale,%
5351     OCIColumnTypeRaw,OCINewCollection,OCIFreeCollection,%
5352     OCICollAppend,OCICollAssignElem,OCICollGetElem,OCICollMax,%
5353     OCICollTrim,%
5354  %--- oracle functions
5355     Ora_Bind,Ora_Close,Ora_ColumnName,Ora_ColumnSize,Ora_ColumnType,%
5356     Ora_CommitOff,Ora_CommitOn,Ora_Do,Ora_Error,Ora_ErrorCode,%
5357     Ora_Fetch,Ora_Fetch_Into,Ora_GetColumn,Ora_Logoff,Ora_Logon,%
5358     Ora_Numcols,Ora_Numrows,Ora_Open,Ora_Parse,Ora_Rollback,%
5359  %--- outcontrol functions
5360     flush,ob_start,ob_get_contents,ob_get_length,ob_get_level,%
5361     ob_flush,ob_clean,ob_end_flush,ob_end_clean,ob_implicit_flush,%
5362  %--- ovrimos functions
5363     ovrimos_connect,ovrimos_close,ovrimos_longreadlen,%
5364     ovrimos_execute,ovrimos_cursor,ovrimos_exec,ovrimos_fetch_into,%
5365     ovrimos_result,ovrimos_result_all,ovrimos_num_rows,%
5366     ovrimos_field_name,ovrimos_field_type,ovrimos_field_len,%
5367     ovrimos_free_result,ovrimos_commit,ovrimos_rollback,%
5368  %--- pcntl functions
5369     pcntl_fork,pcntl_signal,pcntl_waitpid,pcntl_wexitstatus,%
5370     pcntl_wifsignaled,pcntl_wifstopped,pcntl_wstopsig,%
5371     pcntl_exec,%
5372  %--- pcre functions
5373     preg_match,preg_match_all,preg_replace,preg_replace_callback,%
5374     preg_quote,preg_grep,Pattern Modifiers,Pattern Syntax,%
5375  %--- pdf functions
5376     pdf_add_annotation,pdf_add_bookmark,pdf_add_launchlink,%
5377     pdf_add_note,pdf_add_outline,pdf_add_pdflink,pdf_add_thumbnail,%
5378     pdf_arc,pdf_arcn,pdf_attach_file,pdf_begin_page,%
5379     pdf_begin_template,pdf_circle,pdf_clip,pdf_close,pdf_closepath,%
5380     pdf_closepath_stroke,pdf_close_image,pdf_close_pdi,%
5381     pdf_concat,pdf_continue_text,pdf_curveto,pdf_delete,%
5382     pdf_endpath,pdf_end_pattern,pdf_end_template,pdf_fill,%
5383     pdf_findfont,pdf_get_buffer,pdf_get_font,pdf_get_fontname,%
5384     pdf_get_image_height,pdf_get_image_width,pdf_get_parameter,%
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5385    pdf_get_pdi_value,pdf_get_majorversion,pdf_get_minorversion,%
5386    pdf_initgraphics,pdf_lineto,pdf_makespotcolor,pdf_moveto,%
5387    pdf_open,pdf_open_CCITT,pdf_open_file,pdf_open_gif,%
5388    pdf_open_image_file,pdf_open_jpeg,pdf_open_memory_image,%
5389    pdf_open_pdi_page,pdf_open_png,pdf_open_tiff,pdf_place_image,%
5390    pdf_rect,pdf_restore,pdf_rotate,pdf_save,pdf_scale,pdf_setcolor,%
5391    pdf_setflat,pdf_setfont,pdf_setgray,pdf_setgray_fill,%
5392    pdf_setlinecap,pdf_setlinejoin,pdf_setlinewidth,pdf_setmatrix,%
5393    pdf_setpolydash,pdf_setrgbcolor,pdf_setrgbcolor_fill,%
5394    pdf_set_border_color,pdf_set_border_dash,pdf_set_border_style,%
5395    pdf_set_duration,pdf_set_font,pdf_set_horiz_scaling,%
5396    pdf_set_info_author,pdf_set_info_creator,pdf_set_info_keywords,%
5397    pdf_set_info_title,pdf_set_leading,pdf_set_parameter,%
5398    pdf_set_text_rendering,pdf_set_text_rise,pdf_set_text_matrix,%
5399    pdf_set_word_spacing,pdf_show,pdf_show_boxed,pdf_show_xy,%
5400    pdf_stringwidth,pdf_stroke,pdf_translate,%
5401 %--- pfpro functions
5402    pfpro_init,pfpro_cleanup,pfpro_process,pfpro_process_raw,%
5403 %--- pgsql functions
5404    pg_close,pg_affected_rows,pg_connect,pg_dbname,pg_end_copy,%
5405    pg_query,pg_fetch_array,pg_fetch_object,pg_fetch_row,%
5406    pg_field_name,pg_field_num,pg_field_prtlen,pg_field_size,%
5407    pg_free_result,pg_last_oid,pg_host,pg_last_notice,pg_lo_close,%
5408    pg_lo_export,pg_lo_import,pg_lo_open,pg_lo_read,pg_lo_seek,%
5409    pg_lo_read_all,pg_lo_unlink,pg_lo_write,pg_num_fields,%
5410    pg_options,pg_pconnect,pg_port,pg_put_line,pg_fetch_result,%
5411    pg_client_encoding,pg_trace,pg_tty,pg_untrace,pg_get_result,%
5412    pg_send_query,pg_cancel_query,pg_connection_busy,%
5413    pg_connection_status,pg_copy_from,pg_copy_to,pg_escape_bytea,%
5414    pg_result_error,%
5415 %--- posix functions
5416    posix_kill,posix_getpid,posix_getppid,posix_getuid,%
5417    posix_getgid,posix_getegid,posix_setuid,posix_seteuid,%
5418    posix_setegid,posix_getgroups,posix_getlogin,posix_getpgrp,%
5419    posix_setpgid,posix_getpgid,posix_getsid,posix_uname,%
5420    posix_ctermid,posix_ttyname,posix_isatty,posix_getcwd,%
5421    posix_getgrnam,posix_getgrgid,posix_getpwnam,posix_getpwuid,%
5422 %--- printer functions
5423    printer_open,printer_abort,printer_close,printer_write,%
5424    printer_set_option,printer_get_option,printer_create_dc,%
5425    printer_start_doc,printer_end_doc,printer_start_page,%
5426    printer_create_pen,printer_delete_pen,printer_select_pen,%
5427    printer_delete_brush,printer_select_brush,printer_create_font,%
5428    printer_select_font,printer_logical_fontheight,%
5429    printer_draw_rectangle,printer_draw_elipse,printer_draw_text,%
5430    printer_draw_chord,printer_draw_pie,printer_draw_bmp,%
5431 %--- pspell functions
5432    pspell_add_to_personal,pspell_add_to_session,pspell_check,%
5433    pspell_config_create,pspell_config_ignore,pspell_config_mode,%
5434    pspell_config_repl,pspell_config_runtogether,%
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5435    pspell_new,pspell_new_config,pspell_new_personal,%
5436    pspell_store_replacement,pspell_suggest,%
5437  %--- qtdom functions
5438    qdom_tree,qdom_error,%
5439  %--- readline functions
5440    readline,readline_add_history,readline_clear_history,%
5441    readline_info,readline_list_history,readline_read_history,%
5442  %--- recode functions
5443    recode_string,recode,recode_file,%
5444  %--- regex functions
5445    ereg,ereg_replace,eregi,eregi_replace,split,spliti,sql_regcase,%
5446  %--- sem functions
5447    sem_get,sem_acquire,sem_release,sem_remove,shm_attach,%
5448    shm_remove,shm_put_var,shm_get_var,shm_remove_var,ftok,%
5449  %--- sesam functions
5450    sesam_connect,sesam_disconnect,sesam_settransaction,%
5451    sesam_rollback,sesam_execimm,sesam_query,sesam_num_fields,%
5452    sesam_diagnostic,sesam_fetch_result,sesam_affected_rows,%
5453    sesam_field_array,sesam_fetch_row,sesam_fetch_array,%
5454    sesam_free_result,%
5455  %--- session functions
5456    session_start,session_destroy,session_name,session_module_name,%
5457    session_id,session_register,session_unregister,session_unset,%
5458    session_get_cookie_params,session_set_cookie_params,%
5459    session_encode,session_set_save_handler,session_cache_limiter,%
5460    session_write_close,%
5461  %--- shmop functions
5462    shmop_open,shmop_read,shmop_write,shmop_size,shmop_delete,%
5463  %--- snmp functions
5464    snmpget,snmpset,snmpwalk,snmpwalkoid,snmp_get_quick_print,%
5465    snmprealwalk,%
5466  %--- strings functions
5467    addcslashes,addslashes,bin2hex,chop,chr,chunk_split,%
5468    count_chars,crc32,crypt,echo,explode,get_html_translation_table,%
5469    hebrev,hebrevc,htmlentities,htmlspecialchars,implode,join,%
5470    localeconv,ltrim,md5,md5_file,metaphone,nl_langinfo,nl2br,ord,%
5471    print,printf,quoted_printable_decode,quotemeta,str_rot13,rtrim,%
5472    setlocale,similar_text,soundex,sprintf,strncasecmp,strcasecmp,%
5473    strcmp,strcoll,strcspn,strip_tags,stripcslashes,stripslashes,%
5474    strlen,strnatcmp,strnatcasecmp,strncmp,str_pad,strpos,strrchr,%
5475    strrev,strrpos,strspn,strstr,strtok,strtolower,strtoupper,%
5476    strtr,substr,substr_count,substr_replace,trim,ucfirst,ucwords,%
5477    vsprintf,wordwrap,%
5478  %--- swf functions
5479    swf_openfile,swf_closefile,swf_labelframe,swf_showframe,%
5480    swf_getframe,swf_mulcolor,swf_addcolor,swf_placeobject,%
5481    swf_removeobject,swf_nextid,swf_startdoaction,%
5482    swf_actiongeturl,swf_actionnextframe,swf_actionprevframe,%
5483    swf_actionstop,swf_actiontogglequality,swf_actionwaitforframe,%
5484    swf_actiongotolabel,swf_enddoaction,swf_defineline,%
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5485    swf_definepoly,swf_startshape,swf_shapelinesolid,%
5486    swf_shapefillsolid,swf_shapefillbitmapclip,%
5487    swf_shapemoveto,swf_shapelineto,swf_shapecurveto,%
5488    swf_shapearc,swf_endshape,swf_definefont,swf_setfont,%
5489    swf_fontslant,swf_fonttracking,swf_getfontinfo,swf_definetext,%
5490    swf_definebitmap,swf_getbitmapinfo,swf_startsymbol,%
5491    swf_startbutton,swf_addbuttonrecord,swf_oncondition,%
5492    swf_viewport,swf_ortho,swf_ortho2,swf_perspective,swf_polarview,%
5493    swf_pushmatrix,swf_popmatrix,swf_scale,swf_translate,swf_rotate,%
5494  %--- sybase functions
5495    sybase_affected_rows,sybase_close,sybase_connect,%
5496    sybase_fetch_array,sybase_fetch_field,sybase_fetch_object,%
5497    sybase_field_seek,sybase_free_result,sybase_get_last_message,%
5498    sybase_min_error_severity,sybase_min_message_severity,%
5499    sybase_num_fields,sybase_num_rows,sybase_pconnect,sybase_query,%
5500    sybase_select_db,%
5501  %--- uodbc functions
5502    odbc_autocommit,odbc_binmode,odbc_close,odbc_close_all,%
5503    odbc_connect,odbc_cursor,odbc_do,odbc_error,odbc_errormsg,%
5504    odbc_execute,odbc_fetch_into,odbc_fetch_row,odbc_fetch_array,%
5505    odbc_fetch_object,odbc_field_name,odbc_field_num,%
5506    odbc_field_len,odbc_field_precision,odbc_field_scale,%
5507    odbc_longreadlen,odbc_num_fields,odbc_pconnect,odbc_prepare,%
5508    odbc_result,odbc_result_all,odbc_rollback,odbc_setoption,%
5509    odbc_tableprivileges,odbc_columns,odbc_columnprivileges,%
5510    odbc_primarykeys,odbc_foreignkeys,odbc_procedures,%
5511    odbc_specialcolumns,odbc_statistics,%
5512  %--- url functions
5513    base64_decode,base64_encode,parse_url,rawurldecode,rawurlencode,%
5514    urlencode,%
5515  %--- var functions
5516    doubleval,empty,floatval,gettype,get_defined_vars,%
5517    import_request_variables,intval,is_array,is_bool,is_double,%
5518    is_int,is_integer,is_long,is_null,is_numeric,is_object,is_real,%
5519    is_scalar,is_string,isset,print_r,serialize,settype,strval,%
5520    unset,var_dump,var_export,is_callable,%
5521  %--- vpopmail functions
5522    vpopmail_add_domain,vpopmail_del_domain,%
5523    vpopmail_add_domain_ex,vpopmail_del_domain_ex,%
5524    vpopmail_add_user,vpopmail_del_user,vpopmail_passwd,%
5525    vpopmail_auth_user,vpopmail_alias_add,vpopmail_alias_del,%
5526    vpopmail_alias_get,vpopmail_alias_get_all,vpopmail_error,%
5527  %--- w32api functions
5528    w32api_set_call_method,w32api_register_function,%
5529    w32api_deftype,w32api_init_dtype,%
5530  %--- wddx functions
5531    wddx_serialize_value,wddx_serialize_vars,wddx_packet_start,%
5532    wddx_add_vars,wddx_deserialize,%
5533  %--- xml functions
5534    xml_parser_create,xml_set_object,xml_set_element_handler,%
```

```
5535    xml_set_processing_instruction_handler,xml_set_default_handler,%
5536    xml_set_notation_decl_handler,%
5537    xml_parse,xml_get_error_code,xml_error_string,%
5538    xml_get_current_column_number,xml_get_current_byte_index,%
5539    xml_parser_free,xml_parser_set_option,xml_parser_get_option,%
5540    utf8_encode,xml_parser_create_ns,%
5541    xml_set_start_namespace_decl_handler,%
5542  %--- xslt functions
5543    xslt_set_log,xslt_create,xslt_errno,xslt_error,xslt_free,%
5544    xslt_set_sax_handler,xslt_set_scheme_handler,%
5545    xslt_set_base,xslt_set_encoding,xslt_set_sax_handlers,%
5546  %--- yaz functions
5547    yaz_addinfo,yaz_close,yaz_connect,yaz_errno,yaz_error,yaz_hits,%
5548    yaz_database,yaz_range,yaz_record,yaz_search,yaz_present,%
5549    yaz_scan,yaz_scan_result,yaz_ccl_conf,yaz_ccl_parse,%
5550    yaz_wait,yaz_sort,%
5551  %--- zip functions
5552    zip_close,zip_entry_close,zip_entry_compressedsize,%
5553    zip_entry_filesize,zip_entry_name,zip_entry_open,zip_entry_read,%
5554    zip_read,%
5555  %--- zlib functions
5556    gzclose,gzeof,gzfile,gzgetc,gzgets,gzgetss,gzopen,gzpassthru,%
5557    gzread,gzrewind,gzseek,gztell,gzwrite,readgzfile,gzcompress,%
5558    gzdeflate,gzinflate,gzencode,},%
5559    sensitive,%
5560    morecomment=[l]\#,%
5561    morecomment=[l]//,%
5562    morecomment=[s]{/*}{*/},%
5563    morestring=[b]",%
5564    morestring=[b]'%
5565  }[keywords,comments,strings]%

5566 ⟨/lang2⟩
```

## 2.59   Plasm

Alessio Pace provided the following definition.

```
5567 ⟨*lang3⟩

5568 \lst@definelanguage{Plasm}%
5569   {sensitive=false,%
5570    morekeywords={aa,abs,ac,acolor,acos,actor,al,alias,align,and,%
5571       animation,animation,appearance,apply,ar,arc,as,asin,assoc,atan,%
5572       axialcamera,axialcameras,basehermite,bbox,bbox,bernstein,%
5573       bernsteinbasis,bezier,beziercurve,beziermanifold,bezierstripe,%
5574       beziersurface,bigger,biggest,bilinearsurface,binormal,%
5575       biquadraticsurface,black,blend,blue,bottom,box,brown,bspize,%
5576       bspline,bsplinebasis,c,cabinet,camera,cart,case,cat,catch,ceil,%
5577       centeredcameras,centralcavalier,char,charseq,choose,circle,%
5578       circumference,class,cmap,color,comp,computecoords,cone,%
```

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```
5579    conicalsurface,cons,control,convexcoords,convexhull,coonspatch,%
5580    copy,cos,cosh,crease,crosspolytope,cube,cubiccardinal,%
5581    cubiccardinalbasis,cubichermite,cubicubspline,cubicubsplinebasis,%
5582    cuboid,curl,curvature,curve2cspath,curve2mapvect,cyan,cylinder,%
5583    cylindricalsurface,d,deboor,def,depol,depth_sort,depth_test,%
5584    derbernstein,derbernsteinbase,derbezier,determinant,difference,%
5585    differencepr,dim,dimetric,dirproject,displaygraph,displaynubspline,%
5586    displaynurbspline,distl,distr,div,divergence,dodecahedron,dot,down,%
5587    dp,drawedges,drawforks,drawtree,ds,dsphere,dump,dumpprep,ellipse,%
5588    embed,end,eq,ex,exp,explode,export,extract_bodies,extract_polygons,%
5589    extract_wires,extrude,extrusion,fact,false,feature,ff,fillcolor,%
5590    filter,finitecone,first,flash,flashani,floor,fontcolor,fontheight,%
5591    fontspacing,fontwidth,fractalsimplex,frame,frame,frameflash,fromto,%
5592    gausscurvature,ge,grad,gradient,gradmap,gray,green,gt,help,hermite,%
5593    hermitebasis,hermitesurface,hexahedron,icosahedron,id,idnt,if,in,%
5594    inarcs,innerprod,inset,insl,insr,intersection,intersectionpr,%
5595    intervals,intmax,intmin,intsto,inv,isa,isanimpol,isbool,ischar,%
5596    isclosedshape,iscloseto,isempty,iseven,isfun,isfunvect,isge,isgt,%
5597    isint,isintneg,isinto,isintpos,isle,islt,ismat,ismatof,isnat,%
5598    isnull,isnum,isnumneg,isnumpos,isodd,isometric,isorthoshape,ispair,%
5599    ispoint,ispointseq,ispol,ispoldim,ispolytope,ispurepol,isreal,%
5600    isrealneg,isrealpos,isrealvect,isseq,isseqof,isshape,issimplex,%
5601    issqrmat,isstring,isvect,iszero,jacobian,join,joints,k,last,le,%
5602    left,leftcavalier,len,less,lesseq,lex,lift,light,linecolor,%
5603    linesize,list,ln,load,loadlib,loop,lt,lxmy,magenta,map,mapshapes,%
5604    markersize,mat,matdotprod,material,mathom,max,mean,meanpoint,med,%
5605    merge,mesh,min,minkowski,mirror,mixedprod,mk,mkframe,mkpol,%
5606    mkvector,mkversork,mod,model,move,mul,multextrude,mxby,mxmy,mxty,%
5607    myfont,n,nat2string,neq,ngon,norm2,normalmap,not,nu_grid,nubspline,%
5608    nubsplineknots,nurbspline,nurbsplineknots,octahedron,offset,%
5609    onepoint,open,optimize,or,orange,ord,ortho,orthoproject,orthox,%
5610    orthoy,orthoz,outarcs,outerloop,outerwarp,pairdiff,parallel,%
5611    pascaltriangle,pdiff,pdifference,permutahedron,permutations,%
5612    perspective,perspective,pi,pivotop,plane,planemapping,pmap,%
5613    points2shape,polar,polyline,polymarker,polypoint,power,powerset,%
5614    presort,principalnormal,print,prism,profileprodsurface,%
5615    progressivesum,project,projection,purple,pyramid,q,quadarray,%
5616    quadmesh,quote,r,raise,range,rationalbezier,rationalblend,%
5617    rationalbspline,rationalize,red,rev,reverse,rgbacolor,right,%
5618    rightcavalier,ring,rn,rotatedtext,rotationalsurface,rotn,rtail,%
5619    ruledsurface,rxmy,s,save,scalarmatprod,scalarvectprod,schlegel2d,%
5620    schlegel3d,sdifference,sdifferencepr,segment,sel,setand,setdiff,%
5621    setfontcolor,setor,setxor,sex,shape_0,shape_1,shape2points,%
5622    shape2pol,shapeclosed,shapecomb,shapediff,shapedist,%
5623    shapeinbetweening,shapeinf,shapejoin,shapelen,shapenorm,%
5624    shapenormal,shapeprod,shaperot,shapesum,shapesup,shapezero,shift,%
5625    showprop,sign,signal,simplex,simplexpile,sin,sinh,size,skeleton,%
5626    skew,smaller,smallest,solidifier,solidify,sort,sphere,spline,%
5627    splinesampling,splitcells,splitpols,sqr,sqrt,star,string,%
5628    stringtokens,struct,sub,svg,sweep,t,tail,tan,tangent,tanh,%
```

```
5629        tensorprodsurface,tetrahedron,text,texture,textwithattributes,%
5630        thinsolid,threepoints,time,tmax,tmin,top,torus,torusmap,trace,%
5631        trans,tree,trianglefan,trianglestripe,trimetric,true,truncone,tt,%
5632        tube,twopoints,uk,ukpol,ukpolf,union,unionpr,unitvect,unprune,up,%
5633        vect2dtoangle,vect2mat,vectdiff,vectnorm,vectprod,vectsum,view,%
5634        viewmodel,viewmodel,vrml,warp,warp,where,white,with,xcavalier,xor,%
5635        xquadarray,xx,ycavalier,yellow},%
5636    moredirectives={loadlib},%
5637    otherkeywords={-,+,*,**,/,~,|,..,^,\&,\&\&,\#,\#\#},%
5638    morecomment=[s]{\%}{\%},%
5639    morestring=[b]',%
5640    literate={~}{{$\sim$}}{1} {^}{$\wedge$}{1},%
5641    }[keywords,directives,comments,strings]%

5642 ⟨/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

```
5643 ⟨*lang3⟩

5644 \lst@definelanguage{PL/I}%
5645    {morekeywords={ABS,ATAN,AUTOMATIC,AUTO,ATAND,BEGIN,BINARY,BIN,BIT,%
5646        BUILTIN,BY,CALL,CHARACTER,CHAR,CHECK,COLUMN,COL,COMPLEX,CPLX,%
5647        COPY,COS,COSD,COSH,DATA,DATE,DECIMAL,DEC,DECLARE,DCL,DO,EDIT,%
5648        ELSE,END,ENDFILE,ENDPAGE,ENTRY,EXP,EXTERNAL,EXT,FINISH,FIXED,%
5649        FIXEDOVERFLOW,FOFL,FLOAT,FORMAT,GET,GO,GOTO,IF,IMAG,INDEX,%
5650        INITIAL,INIT,INTERNAL,INT,LABEL,LENGTH,LIKE,LINE,LIST,LOG,LOG2,%
5651        LOG10,MAIN,MAX,MIN,MOD,NOCHECK,NOFIXEDOVERFLOW,NOFOFL,NOOVERFLOW,%
5652        NOOFL,NOSIZE,NOUNDERFLOW,NOUFL,NOZERODIVIDE,NOZDIV,ON,OPTIONS,%
5653        OVERFLOW,OFL,PAGE,PICTURE,PROCEDURE,PROC,PUT,READ,REPEAT,RETURN,%
5654        RETURNS,ROUND,SIN,SIND,SINH,SIZE,SKIP,SQRT,STATIC,STOP,STRING,%
5655        SUBSTR,SUM,SYSIN,SYSPRINT,TAN,TAND,TANH,THEN,TO,UNDERFLOW,UFL,%
5656        VARYING,WHILE,WRITE,ZERODIVIDE,ZDIV},%
5657    sensitive=f,%
5658    morecomment=[s]{/*}{*/},%
5659    morestring=[d]'%
5660    }[keywords,comments,strings]%

5661 ⟨/lang3⟩
```

## 2.61    PostScript

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

```
5662 ⟨*lang3⟩
```

```
5663 %%
5664 %% PostScript language definition (c) 2005 Christophe Jorssen.
5665 %%
5666 \lst@definelanguage{PostScript}{%
5667   morekeywords={abs,add,aload,anchorsearch,and,arc,arcn,arct,arcto,array,ashow,
5668     astore,atan,awidthshow,begin,bind,bitshift,bytesavailable,cachestatus,
5669     ceiling,charpath,clear,cleartomark,cleardictstack,clip,clippath,closefile,
5670     closepath,colorimage,concat,concatmatrix,condition,copy,copypage,cos,count,
5671     countdictstack,countexecstack,counttomark,cshow,currentblackgeneration,
5672     currentcacheparams,currentcmykcolor,currentcolor,currentcolorrendering,
5673     currentcolorscreen,currentcolorspace,currentcolortransfer,currentcontext,
5674     currentdash,currentdevparams,currentdict,currentfile,currentflat,currentfont,
5675     currentglobal,currentgray,currentgstate,currenthalftone,currenthalftonephase,
5676     currenthsbcolor,currentlinecap,currentlinejoin,currentlinewidth,currentmatrix,
5677     currentmiterlimit,currentobjectformat,currentpacking,currentpagedevice,
5678     currentpoint,currentrgbcolor,currentscreen,currentshared,currentstrokeadjust,
5679     currentsystemparams,currenttransfer,currentundercolorremoval,currentuserparams,
5680     curveto,cvi,cvlit,cvn,cvr,cvrs,cvs,cvx,def,defaultmatrix,definefont,
5681     defineresource,defineusername,defineuserobject,deletefile,detach,deviceinfo,
5682     dict,dictstack,div,dtransform,dup,
5683     echo,eexec,end,eoclip,eofill,eoviewclip,eq,erasepage,errordict,exch,exec,
5684     execform,execstack,execuserobject,executeonly,executive,exit,
5685     exp,false,file,filenameforall,fileposition,fill,filter,findencoding,findfont,
5686     findresource,flattenpath,floor,flush,flushfile,FontDirectory,for,forall,fork,ge,
5687     get,getinterval,globaldict,GlobalFontDirectory,glyphshow,grestore,grestoreall,
5688     gsave,gstate,gt,identmatrix,idiv,idtransform,if,ifelse,image,
5689     imagemask,index,ineofill,infill,initclip,initgraphics,initmatrix,initviewclip,
5690     instroke,internaldict,inueofill,inufill,inustroke,
5691     invertmatrix,ISOLatin1Encoding,itransform,join,kshow,
5692     known,languagelevel,le,length,lineto,ln,load,lock,log,loop,lt,
5693     makefont,makepattern,mark,matrix,maxlength,mod,monitor,moveto,mul,ne,neg,
5694     newpath,noaccess,not,notify,null,nulldevice,or,packedarray,
5695     pathbbox,pathforall,pop,print,printobject,product,prompt,pstack,put,putinterval,
5696     quit,rand,rcurveto,read,readhexstring,readline,readonly,readstring,
5697     realtime,rectclip,rectfill,rectstroke,rectviewclip,renamefile,repeat,resetfile,
5698     resourceforall,resourcestatus,restore,reversepath,revision,rlineto,rmoveto,roll,
5699     rootfont,rotate,round,rrand,run,save,scale,scalefont,scheck,search,selectfont,
5700     serialnumber,setbbox,setblackgeneration,setcachedevice,setcachedevice2,
5701     setcachelimit,setcacheparams,setcharwidth,setcmykcolor,setcolor,
5702     setcolorrendering,setcolorscreen,setcolorspace,setcolortransfer,setdash,
5703     setdevparams,setfileposition,setflat,setfont,setglobal,setgray,setgstate,
5704     sethalftone,sethalftonephase,sethsbcolor,setlinecap,setlinejoin,setlinewidth,
5705     setmatrix,setmiterlimit,setobjectformat,setoverprint,setpacking,setpagedevice,
5706     setpattern,setrgbcolor,setscreen,setshared,setstrokeadjust,setsystemparams,
5707     settransfer,setucacheparams,setundercolorremoval,setuserparams,setvmthreshold,
5708     shareddict,show,showpage,sin,sqrt,srand,stack,
5709     StandardEncoding,start,startjob,status,statusdict,stop,stopped,store,string,
5710     stringwidth,stroke,strokepath,sub,systemdict,transform,
5711     translate,true,truncate,type,token,uappend,ucache,ucachestatus,
5712     ueofill,ufill,undef,
```

```
5713      upath,userdict,UserObjects,
5714      usertime,ustroke,ustrokepath,version,viewclip,viewclippath,vmreclaim,
5715      vmstatus,wait,wcheck,where,widthshow,write,writehexstring,writeobject,
5716      writestring,wtranslation,xcheck,xor,xshow,xyshow,yield,yshow},
5717    sensitive,
5718    morecomment=[l]\%}[keywords,comments]
```

5719 ⟨/lang3⟩

## 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.

5720 ⟨∗lang1⟩

```
5721 %%
5722 %% POV definition (c) 1999 Berthold H\"ollmann
5723 %%
5724 \lst@definelanguage{POV}%
5725    {morekeywords={abs,absorption,acos,acosh,adaptive,adc_bailout,agate,%
5726        agate_turb,all,alpha,ambient,ambient_light,angle,aperture,append,%
5727        arc_angle,area_light,array,asc,asin,asinh,assumed_gamma,atan,%
5728        atan2,atanh,average,background,bezier_spline,bicubic_patch,%
5729        black_hole,blob,blue,blur_samples,bounded_by,box,boxed,bozo,%
5730        break,brick,brick_size,brightness,brilliance,bumps,bump_map,%
5731        bump_size,camera,case,caustics,ceil,checker,chr,clipped_by,clock,%
5732        clock_delta,color,color_map,colour,colour_map,component,%
5733        composite,concat,cone,confidence,conic_sweep,control0,control1,%
5734        cos,cosh,count,crackle,crand,cube,cubic,cubic_spline,cubic_wave,%
5735        cylinder,cylindrical,debug,declare,default,defined,degrees,%
5736        density,density_file,density_map,dents,difference,diffuse,%
5737        dimensions,dimension_size,direction,disc,distance,%
5738        distance_maximum,div,eccentricity,else,emission,end,error,%
5739        error_bound,exp,extinction,fade_distance,fade_power,falloff,%
5740        falloff_angle,false,fclose,file_exists,filter,finish,fisheye,%
5741        flatness,flip,floor,focal_point,fog,fog_alt,fog_offset,fog_type,%
5742        fopen,frequency,gif,global_settings,gradient,granite,%
5743        gray_threshold,green,height_field,hexagon,hf_gray_16,hierarchy,%
5744        hollow,hypercomplex,if,ifdef,iff,ifndef,image_map,include,int,%
5745        interior,interpolate,intersection,intervals,inverse,ior,irid,%
5746        irid_wavelength,jitter,julia_fractal,lambda,lathe,leopard,%
5747        light_source,linear_spline,linear_sweep,local,location,log,%
5748        looks_like,look_at,low_error_factor,macro,mandel,map_type,marble,%
5749        material,material_map,matrix,max,max_intersections,max_iteration,%
5750        max_trace_level,media,media_attenuation,media_interaction,merge,%
5751        mesh,metallic,min,minimum_reuse,mod,mortar,nearest_count,no,%
5752        normal,normal_map,no_shadow,number_of_waves,object,octaves,off,%
5753        offset,omega,omnimax,on,once,onion,open,orthographic,panoramic,%
5754        perspective,pgm,phase,phong,phong_size,pi,pigment,pigment_map,%
```

```
5755      planar,plane,png,point_at,poly,polygon,poly_wave,pot,pow,ppm,%
5756      precision,prism,pwr,quadratic_spline,quadric,quartic,quaternion,%
5757      quick_color,quick_colour,quilted,radial,radians,radiosity,radius,%
5758      rainbow,ramp_wave,rand,range,ratio,read,reciprocal,%
5759      recursion_limit,red,reflection,reflection_exponent,refraction,%
5760      render,repeat,rgb,rgbf,rgbft,rgbt,right,ripples,rotate,roughness,%
5761      samples,scale,scallop_wave,scattering,seed,shadowless,sin,%
5762      sine_wave,sinh,sky,sky_sphere,slice,slope_map,smooth,%
5763      smooth_triangle,sor,specular,sphere,spherical,spiral1,spiral2,%
5764      spotlight,spotted,sqr,sqrt,statistics,str,strcmp,strength,strlen,%
5765      strlwr,strupr,sturm,substr,superellipsoid,switch,sys,t,tan,tanh,%
5766      text,texture,texture_map,tga,thickness,threshold,tightness,tile2,%
5767      tiles,torus,track,transform,translate,transmit,triangle,%
5768      triangle_wave,true,ttf,turbulence,turb_depth,type,u,%
5769      ultra_wide_angle,undef,union,up,use_color,use_colour,use_index,%
5770      u_steps,v,val,variance,vaxis_rotate,vcross,vdot,version,vlength,%
5771      vnormalize,vrotate,v_steps,warning,warp,water_level,waves,while,%
5772      width,wood,wrinkles,write,x,y,yes,z},%
5773    moredirectives={break,case,debug,declare,default,else,end,fclose,%
5774      fopen,local,macro,read,render,statistics,switch,undef,version,%
5775      warning,write},%
5776    moredelim=*[directive]\#,%
5777    sensitive,%
5778    morecomment=[l]//,%
5779    morecomment=[s]{/*}{*/},%
5780    morestring=[d]",%
5781    }[keywords,directives,comments,strings]%

5782  ⟨/lang1⟩
```

## 2.63   Prolog

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

```
5783  ⟨∗lang2⟩

5784  %%
5785  %% Prolog definition (c) 1997 Dominique de Waleffe
5786  %%
5787  \lst@definelanguage{Prolog}%
5788    {morekeywords={op,mod,abort,ancestors,arg,ascii,ask,assert,asserta,%
5789      assertz,atom,atomic,char,clause,close,concat,consult,ed,ef,em,%
5790      eof,fail,file,findall,write,functor,getc,integer,is,length,%
5791      listing,load,name,nl,nonvar,not,numbervars,op,or,pp,prin,print,%
5792      private,prompt,putc,ratom,read,read_from_this_file,rename,repeat,%
5793      retract,retractall,save,see,seeing,seen,sh,skip,statistics,%
5794      subgoal_of,system,tab,tell,telling,time,told,trace,true,unload,%
5795      untrace,var,write},%
5796    sensitive=f,%
5797    morecomment=[l]\%,%
```

```
5798    morecomment=[s]{/*}{*/},%
5799    morestring=[bd]",%
5800    morestring=[bd]'%
5801   }[keywords,comments,strings]%
```

5802 ⟨/lang2⟩

## 2.64   Promela

Thanks to William ThimblebyPromela for this language definition.

5803 ⟨∗lang3⟩

```
5804 %%
5805 %% Promela definition (c) 2004 William Thimbleby
5806 %%
5807 \lst@definelanguage{Promela}
5808   {morekeywords={active,assert,atomic,bit,bool,break,byte,chan,d_step,%
5809       Dproctype,do,else,empty,enabled,fi,full,goto,hidden,if,init,int,%
5810       len,mtype,nempty,never,nfull,od,of,pcvalue,printf,priority,%
5811       proctype,provided,run,short,skip,timeout,typedef,unless,unsigned,%
5812       xr,xs,true,false,inline,eval},%
5813   moredirectives={define,ifdef,ifndef,if,if,else,endif,undef,include},%
5814   moredelim=*[directive]\#,%
5815   morecomment=[s]{/*}{*/},%
5816   morestring=[b]"%
5817   }[keywords,comments,strings,directives]%
```

5818 ⟨/lang3⟩

## 2.65   PSTricks

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

5819 ⟨∗lang3⟩

```
5820 %%
5821 %% PSTricks definition (c) 2006 Herbert Voss
5822 %%
5823 \lst@definelanguage{PSTricks}%
5824   {morekeywords={%
5825     begin,end,definecolor,multido,%
5826     KillGlue,DontKillGlue,pslbrace,bsrbrace,psscalebox,psset,pstVerb,pstverb,%
5827     pst@def,,psframebox,psclip,endclip,endpspicture,psframe,
5828 %%      pspicture,%
5829     multirput,multips,Rput,rput,uput,cput,lput,%
5830     newrgbcolor,newgray,newcmykcolor,
5831 %%
5832 %% pstricks-add
5833     psStep,psgraph,psbrace,psPrintValue,
5834 %%
5835 %% pst-plot
```

```
5836      psvlabel,pshlabel,psplot,psline,pscustom,pscurve,psccurve,%
5837      readdata,savedata,fileplot,dataplot,listplot,%
5838      psecurce,psgraph,parametricplot,%
5839      psellipse,psaxes,ncline,nccurve,psbezier,parabola,%
5840      qdisk,qline,clipbox,endpsclip,%
5841      psgrid,pscircle,pscirclebox,psdiabox,pstribox,%
5842      newpsfontdot,psdot,psdots,%
5843      pspolygon,psdiamond,psoval,pstriangle,%
5844      psarc,psarcn,psellipticarc,psellipticarcn,pswedge,psellipticwedge,
5845      pcline,pcdiag,pcdiagg,pccurve,pccurve,pcecurve,%
5846      scalebox,scaleboxto,psmathboxtrue,everypsbox,psverbboxtrue,overlaybox,%
5847      psoverlay,putoverlaybox,%
5848      newpsstyle,newpsobject,%
5849      moveto,newpath,closepath,stroke,fill,gsave,grestore,msave,mrestore,translate,scale,%
5850      swapaxes,rotate,openshadow,closedshadow,movepath,lineto,rlineto,curveto,rcurveto,%
5851      code,dim,coor,rcoor,file,arrows,setcolor,%
5852      rotateleft,rotateright,rotatedown,%
5853 %%
5854 %% pst-node
5855      nput,naput,nbput,ncput,%
5856      ncarc,ncbox,ncangle,ncangles,ncloop,ncdiag,ncdiagg,ncarcbox,ncbar,%
5857      cnodeput,nccircle,%
5858      pnode,rnode,Rnode,Cnode,cnode,fnode,%
5859      circlenode,ovalnode,trinode,dianode,%
5860      psmatrix,endpsmatrix,psspan,%
5861 %%
5862 %% pst-tree
5863      pstree,Tcircle,TCircle,Ttri,Tn,TC,Tc,Tfan,TR,Tr,Tdia,Toval,Tdot,Tp,Tf,%
5864      skiplevel,skiplevels,endskiplevels,tspace,tlput,%
5865 %%
5866 %% pst-text
5867      pscharpath,pstextpath,
5868 %%
5869 %% pst-barcode
5870      psbarcode,
5871 %%
5872 %% pst-coil
5873      psboxfill,pscoil,psCoil,pszigzag,nccoil,
5874      psshadow,pstilt,psTilt,ThreeDput,
5875 %%
5876 %% pst-gr3d
5877      PstGridThreeDNodeProcessor,%
5878 %%
5879 %% pst-vue3d
5880      PstGridThreeD,
5881      AxesThreeD,LineThreeD,DieThreeD,FrameThreeD,SphereCircleThreeD,SphereMeridienThreeD,
5882      QuadrillageThreeD,TetraedreThreeD,PyramideThreeD,ConeThreeD,CylindreThreeD,
5883      DodecahedronThreeD,ConeThreeD,SphereThreeD,SphereInverseThreeD,DemiSphereThreeD,
5884      SphereCreuseThreeD,SphereCircledThreeD,PortionSphereThreeD,pNodeThreeD,CubeThreeD,%
5885 %%
```

```
5886 %% pst-3dplot
5887     pstThreeDCoor,pstThreeDDot,pstThreeDTriangle,pstThreeDCircle,pstPlanePut,%
5888     pstThreeDBox,pstThreeDEllipse,pstThreeDLine,pstThreeDPut,%
5889     pstThreeDNode,pstThreeDSquare,psplotThreeD,parametricplotThreeD,fileplotThreeD,%
5890     dataplotThreeD,pstScalePoints,%
5891 %%
5892 %% pst-circ
5893     resistor,battery,Ucc,Icc,capacitor,coil,diode,Zener,LED,lamp,switch,wire,tension,
5894     circledipole,multidipole,OA,transistor,Tswitch,potentiometer,transformer,
5895     optoCoupler,logic,
5896 %%
5897 %% pst-eucl
5898     pstTriangle,pstMediatorAB,pstInterLL,pstMiddleAB,pstProjection,pstCircleOA,pstLineAB,%
5899 %%
5900 %% pst-func
5901     psBessel,psPolynomial,psFourier,psGaussI,psGauss,psSi,pssi,psCi,psci,%
5902 %%
5903 %% pst-infixplot
5904     psPlot,
5905 %%
5906 %% pst-ob3d
5907     PstDie,PstCube,
5908 %%
5909 %% pst-poly
5910     PstPolygon,pspolygonbox,
5911 %%
5912 %% pst-bar
5913     psbarchart,readpsbardata,psbarscale,newpsbarstyle,%
5914 %%
5915 %% pst-lens
5916     PstLens,%
5917 %%
5918 %% pst-geo
5919     WorldMap,WorldMapII,WorldMapThreeD,WorldMapThreeDII,pnodeMap,MapPut,%
5920 %%
5921 %% pst-autoseg
5922     asr,firstnode,merge,massoc,labelmerge,%
5923 %%
5924 %% gastex
5925     node,imark,fmark,rmark,drawqbpedge,drawedge,drawloop,%
5926 %%
5927 %% pst-labo
5928     Distillation,Ballon,
5929 %%
5930 %% pst-optic
5931     lens,Transform,%
5932 %%
5933 %% pst-light3d
5934     PstLightThreeDText,%
5935 %%
```

```
5936 %% calendrier
5937    Calendrier,%
5938 %%
5939 %% pst-osci
5940    Oscillo%
5941  },%
5942    sensitive,%
5943    alsoother={0123456789$_},%
5944    morecomment=[l]\% %
5945  }[keywords,comments]%
```

5946 ⟨/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.

5947 ⟨∗lang1⟩

```
5948 %%
5949 %% Python definition (c) 1998 Michael Weber
5950 %% Additional definitions (2013) Alexis Dimitriadis
5951 %%
5952 \lst@definelanguage{Python}%
5953   {morekeywords={access,and,break,class,continue,def,del,elif,else,%
5954       except,exec,finally,for,from,global,if,import,in,is,lambda,not,%
5955       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

```
5956   % Built-ins
5957    morekeywords=[2]{abs,all,any,basestring,bin,bool,bytearray,callable,chr,
5958       classmethod,cmp,compile,complex,delattr,dict,dir,divmod,enumerate,eval,
5959       execfile,file,filter,float,format,frozenset,getattr,globals,hasattr,hash,
5960       help,hex,id,input,int,isinstance,issubclass,iter,len,list,locals,long,map,
5961       max,memoryview,min,next,object,oct,open,ord,pow,property,range,raw_input,
5962       reduce,reload,repr,reversed,round,set,setattr,slice,sorted,staticmethod,str,
5963       sum,super,tuple,type,unichr,unicode,vars,xrange,zip,apply,buffer,coerce,
5964       intern},
5965    sensitive=true,%
5966    morecomment=[l]\#,%
5967    morestring=[b]',%
5968    morestring=[b]",%
```

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

```
5969    morecomment=[s]{'''}{'''},% used for documentation text (mulitiline strings)
5970    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:

```
5971    morestring=[s]{r'}{'},% 'raw' strings
5972    morestring=[s]{r"}{"},%
5973    morestring=[s]{r'''}{'''},%
5974    morestring=[s]{r"""}{"""},%
5975    morestring=[s]{u'}{'},% unicode strings
5976    morestring=[s]{u"}{"},%
5977    morestring=[s]{u'''}{'''},%
5978    morestring=[s]{u"""}{"""}%
5979    }%
```

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.

```
5980  ⟨/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:

```
5981  ⟨∗python-prf⟩

5982  \usepackage{xcolor}
5983  \usepackage{textcomp}
5984
5985  %% Actual colors from idlelib/config-highlight.def --> corrected to ''web-safe''
5986  %% strings  = #00aa00 / 0,170,0      (a darker green)
5987  %% builtins = #900090 / 144,0,144    (purple-ish)
5988  %% keywords = #FF7700 / 255,119,0    (quite close to plain 'orange')
5989  %\definecolor{IDLEorange}{RGB}{255,119,0} % pretty close to real orange
5990  %\definecolor{IDLEpurple}{RGB}{144,0,144}
5991  %\definecolor{IDLEgreen}{RGB}{0,170,0}
5992  %\definecolor{IDLEred}{RGB}{221,0,0}
5993  %% Corrected to ''web-safe''
5994  %\definecolor{orange2}{RGB}{255,102,0}
5995  \definecolor{purple2}{RGB}{153,0,153} % there's actually no standard purple
5996  \definecolor{green2}{RGB}{0,153,0} % a darker green
5997  %\definecolor{red2}{RGB}{221,0,0}
5998
5999  % Except for green and purple, the other colors are pretty good in standard
6000  % hue
6001  \lstdefinestyle{python-idle-code}{%
6002    language=Python,                   % the language
6003    basicstyle=\normalsize\ttfamily,   % size of the fonts for the code
6004    % Color settings to match IDLE style
6005    keywordstyle=\color{orange},       % core keywords
```

```
6006   keywordstyle={[2]\color{purple2}}, % built-ins
6007   stringstyle=\color{green2},
6008   commentstyle=\color{red},
6009   upquote=true,                       % requires textcomp
6010 }
6011 % Unimplemented IDLE syntax: function/class names being defined should be
6012 % blue
```

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

6013 ⟨/python-prf⟩

## 2.67   Rexx

Patrick TJ McPhee provided this definition.

6014 ⟨*lang2⟩

```
6015 %%
6016 %% classic rexx listings definition
6017 %% by Patrick TJ McPhee <ptjm@interlog.com>
6018 %%
6019 \lst@definelanguage{Rexx}
6020   {morekeywords={address,arg,call,do,drop,else,end,exit,if,iterate,%
6021                  interpret,leave,nop,numeric,options,otherwise,parse,%
6022                  procedure,pull,push,queue,return,say,signal,then,to,%
6023                  trace,when},%
6024   sensitive=false,%
6025   morecomment=[n]{/*}{*/},%
6026   morestring=[d]{'},%
6027   morestring=[d]{"},%
6028   }[keywords,comments,strings]%
```

6029 ⟨/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

6030 ⟨*lang2⟩

```
6031 %%
6032 %% REXX keywords from System Product Interpreter Reference, VM/XA SP Release 1
6033 %% and Release 2
6034 \lst@definelanguage[VM/XA]{Rexx}[]{Rexx}{%
6035   morekeywords={all,by,digits,commands,end,engineering,error,errors,expose,%
6036     external,for,form,fuzz,halt,labels,intermediates,negative,normal,novalue,%
6037     on,off,results,scan,scientific,select,source,stream,syntax,until,upper,%
6038     value,var,version,while,with},%
6039   ndkeywords={abbrev,abs,address,bitand,bitor,bitxor,center,centre,
```

```
6040    compare,copies,c2d,c2x,datatype,date,delstr,delword,diag,diagrc,%
6041    d2c,d2x,errortext,externals,find,format,index,insert,justify,%
6042    lastpos,left,length,linesize,max,min,overlay,pos,queued,random,%
6043    reverse,rigth,sign,sourceline,space,storage,strip,substr,subword,%
6044    symbol,time,translate,trunc,userid,value,verify,word,wordindex,%
6045    wordlength,words,xrange,x2c,x2d},%
6046  sensitive=false,%
6047  morestring=[d]",%
6048  morestring=[d]',%
6049  morecomment=[s]{/*}{*/},%
6050  alsoletter={:},%
6051 }[keywords,comments,strings]%

6052 ⟨/lang2⟩
```

### 2.67.2   ooRexx

```
6053 ⟨*lang2⟩

6054 %%
6055 %% ooREXX keywords (http://www.oorexx.org/)
6056 \lst@definelanguage[]{OORexx}[VM/XA]{Rexx}{%
6057   morekeywords={::class, ::method, ::attribute},%
6058 }

6059 ⟨/lang2⟩
```

## 2.68   Reduce

was provided by Geraint Paul Bevan.

```
6060 ⟨*lang3⟩

6061 %%
6062 %% Reduce definition (c) 2002 Geraint Paul Bevan
6063 %%
6064 \lst@definelanguage{Reduce}%
6065   {morekeywords={%
6066 %% reserved identifiers
6067 abs,acos,acosh,acot,acoth,acsc,acsch,%
6068 adjprec,algebraic,algint,allbranch,allfac,and,%
6069 antisymmetric,append,arglength,array,asec,asech,%
6070 asin,asinh,atan,atan2,atanh,begin,bfspace,bye,%
6071 card_no,ceiling,clear,clearrules,coeff,coeffn,%
6072 cofactor,combineexpt,combinelogs,comment,comp,%
6073 complex,conj,cons,cont,cos,cosh,cot,coth,cramer,%
6074 cref,csc,csch,decompose,define,defn,deg,demo,den,%
6075 depend,det,df,difference,dilog,display,div,do,e,%
6076 echo,ed,editdef,ei,end,eps,eq,equal,erf,errcont,%
6077 evallhseqp,eval_mode,even,evenp,exp,expandlogs,%
6078 expr,expt,ezgcd,factor,factorial,factorize,fexpr,%
6079 first,fix,fixp,floor,for,forall,foreach,fort,%
6080 fort_width,freeof,fullroots,g,gcd,geq,go,goto,%
6081 greaterp,high_pow,hypot,i,if,ifactor,impart,in,%
```

```
6082 index,infinity,infix,input,int,integer,interpol,%
6083 intstr,k,korder,lambda,lcm,lcof,length,leq,lessp,%
6084 let,lhs,linear,linelength,lisp,list,listargp,%
6085 listargs,ln,load,load_package,log,log10,logb,%
6086 low_pow,lterm,macro,mainvar,mass,mat,match,%
6087 mateigen,matrix,max,mcd,member,memq,min,minus,mkid,%
6088 modular,msg,mshell,multiplicities,nat,neq,nero,%
6089 nextprime,nil,nodepend,noncom,nonzero,nosplit,%
6090 nospur,nullspace,num,numberp,odd,off,on,operator,%
6091 or,order,ordp,out,output,part,pause,period,pf,pi,%
6092 plus,precedence,precise,precision,pret,pri,primep,%
6093 print_precision,procedure,product,quit,quotient,%
6094 random,random_new_seed,rank,rat,ratarg,rational,%
6095 rationalize,ratpri,real,rederr,reduct,remainder,%
6096 remfac,remind,repart,repeat,rest,resultant,retry,%
6097 return,reverse,revpri,rhs,rlisp88,%
6098 root_multiplicity,round,roundall,roundbf,rounded,%
6099 saveas,savestructr,scalar,sec,sech,second,set,%
6100 setmod,setq,share,showrules,showtime,shut,sign,sin,%
6101 sinh,smacro,solve,solvesingular,spur,sqrt,structr,%
6102 sub,sum,symbolic,symmetric,t,tan,tanh,third,time,%
6103 times,tp,tra,trace,trfac,trigform,trint,until,%
6104 varname,vecdim,vector,weight,when,where,while,%
6105 write,ws,wtlevel,%
6106 %% identifiers with spaces
6107 %% for all,for each,go to,such that,%
6108 },%
6109   sensitive=false,%
6110   morecomment=[l]\%,%
6111   morecomment=[s]{COMMENT}{;},%
6112   morecomment=[s]{COMMENT}{$},%
6113   morestring="%
6114 }[keywords,comments,strings]%

6115 ⟨/lang3⟩
```

## 2.69   RSL

Thanks go to Brian Christensen.

```
6116 ⟨*lang3⟩

6117 %%
6118 %% RSL definition (c) 2004 Brian Christensen
6119 %%
6120 \lst@definelanguage{RSL}%
6121   {morekeywords={Bool,Char,devt_relation,Int,Nat,Real,Text,Unit,abs,any,%
6122       as,axiom,card,case,channel,chaos,class,do,dom,elems,else,elsif,end,%
6123       extend,false,for,hd,hide,if,in,inds,initialise,int,len,let,local,%
6124       object,of,out,post,pre,read,real,rng,scheme,skip,stop,swap,%
6125       test_case,theory,then,tl,true,type,until,use,value,variable,while,%
```

```
6126        with,write},%
6127 literate=%
6128 {<}{$<$}{1}%
6129 {>}{$>$}{1}%
6130 {[}{$[$}{1}%%
6131 {]}{$]$}{1}%%
6132 {^}{{\mbox{$\widehat{\;}$}}}{1}%%
6133 {'}{{\raisebox{1ex}[1ex][0ex]{\protect\scriptsize$\prime$}}}{1}%%
6134 {||}{{\mbox{$\parallel$}}}{2}%%
6135 {|-}{$\vdash$}{1}%%
6136 {|=|}{{\mbox{$\lceil\!\rceil\!\!\!\!\!\!\;\lfloor\!\rfloor$}}}{1}%%
6137 {**}{$\uparrow$}{1}%
6138 {/\\}{$\wedge$}{1}%%
6139 {inter}{$\cap$}{1}%%
6140 {-\\}{$\lambda$}{1}%%
6141 {->}{$\rightarrow$}{1}%%
6142 {-m->}{{\mbox{$\rightarrow \hspace{-2.5\lst@width} _{m}\;$}}}{1}%
6143 {-~m->}{{\mbox{$\stackrel{\sim}{\mbox{$\rightarrow\hspace{-2.5\lst@width} _{m}\;$}}$}}}{1}%
6144 {-~->}{{\mbox{$\stackrel{\sim}{\rightarrow}$}}}{1}%%
6145 {-set}{\bf{-set}}{4}%%
6146 {-list}{{$^{\ast}$}}{1}%%
6147 {-inflist}{$^\omega$}{1}%
6148 {-infset}{{\mbox{{\bf -infset}}}}{7}%
6149 {\#}{$\circ$}{1}%
6150 {:-}{{\raisebox{.4ex}{\tiny $\bullet$}}}{1}%%
6151 {=}{$=$}{1}%%
6152 {==}{$==$}{2}%%
6153 {=>}{$\Rightarrow$}{1}%%
6154 {\ is\protect\^^M}{{$\;\equiv$}}{2}%
6155 {\ is\ }{{$\equiv$}}{3}%%
6156 {\ isin\protect\^^M}{$\;\in$}{2}%%
6157 {~}{$\sim$}{1}%%
6158 {~=}{$\neq$}{1}%%
6159 {~isin}{$\notin$}{1}%%
6160 {+>}{$\mapsto$}{1}%%
6161 {++}{}{1}%
6162 {|^|}{{\mbox{$\lceil\!\rceil$}}}{1}%%
6163 {\\/}{$\vee$}{1}%%
6164 {exists}{$\exists$}{1}%%
6165 {union}{$\cup$}{1}%%
6166 {>=}{$\geq$}{1}%%
6167 {><}{$\times$}{1}%%
6168 {>>}{$\supset$}{1}%
6169 {>>=}{$\supseteq$}{1}%%
6170 {<=}{$\leq$}{1}%%
6171 {<<}{$\subset$}{1}%
6172 {<.}{$\langle$}{1}%%
6173 {<<=}{$\subseteq$}{1}%%
6174 {<->}{$\leftrightarrow$}{1}%%
6175 {[=}{$\sqsubseteq$}{1}%%
```

```
6176 {\\{=}{$\preceq$}{1}%%
6177 {\ all\protect\^^M}{$\forall$}{2}%%
6178 {\ all\ }{$\forall$}{3}%%
6179 {!!}{$\dagger$}{1}%%
6180 {always}{$\Box$}{1}%%
6181 {.>}{$\rangle$}{1}%%
6182 {`alpha}{$\alpha$}{1}%
6183 {`beta}{$\beta$}{1}%
6184 {`gamma}{$\gamma$}{1}%
6185 {`delta}{$\delta$}{1}%
6186 {`epsilon}{$\epsilon$}{1}%
6187 {`zeta}{$\zeta$}{1}%
6188 {`eta}{$\eta$}{1}%
6189 {`theta}{$\theta$}{1}%
6190 {`iota}{$\iota$}{1}%
6191 {`kappa}{$\kappa$}{1}%
6192 {`mu}{$\mu$}{1}%
6193 {`nu}{$\nu$}{1}%
6194 {`xi}{$\xi$}{1}%
6195 {`pi}{$\pi$}{1}%
6196 {`rho}{$\rho$}{1}%
6197 {`sigma}{$\sigma$}{1}%
6198 {`tau}{$\tau$}{1}%
6199 {`upsilon}{$\upsilon$}{1}%
6200 {`phi}{$\phi$}{1}%
6201 {`chi}{$\chi$}{1}%
6202 {`psi}{$\psi$}{1}%
6203 {`omega}{$\omega$}{1}%
6204 {`Gamma}{$\Gamma$}{1}%
6205 {`Delta}{$\Delta$}{1}%
6206 {`Theta}{$\Theta$}{1}%
6207 {`Lambda}{$\Lambda$}{1}%
6208 {`Xi}{$\Xi$}{1}%
6209 {`Pi}{$\Pi$}{1}%
6210 {`Sigma}{$\Sigma$}{1}%
6211 {`Upsilon}{$\Upsilon$}{1}%
6212 {`Phi}{$\Phi$}{1}%
6213 {`Psi}{$\Psi$}{1}%
6214 {`Omega}{$\Omega$}{1},%
6215    sensitive=true,%
6216    morecomment=[l]{--},%
6217    morecomment=[s]{/*}{*/}%
6218   }[keywords,comments]%

6219 ⟨/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.

```
6220 ⟨∗lang2⟩

6221 \lst@definelanguage{Ruby}%
6222   {morekeywords={__FILE__,__LINE__,BEGIN,END,alias,and,begin,break,%
6223       case,class,def,defined?,do,else,elsif,end,ensure,false,for,%
6224       if,in,module,next,nil,not,or,redo,rescue,retry,return,self,%
6225       super,then,true,undef,unless,until,when,while,yield},%
6226   sensitive=true,%
6227   morecomment=[l]\#,%
6228   morecomment=[l]\#\#,%
6229   morecomment=[s]{=BEGIN}{=END},%
6230   morestring=[b]',%
6231   morestring=[b]",%
6232   morestring=[s]{\%q/}{/},%
6233   morestring=[s]{\%q!}{!},%
6234   morestring=[s]{\%q\{}{\}},%
6235   morestring=[s]{\%q(}{)},%
6236   morestring=[s]{\%q[}{]},%
6237   morestring=[s]{\%q-}{-},%
6238   morestring=[s]{\%Q/}{/},%
6239   morestring=[s]{\%Q!}{!},%
6240   morestring=[s]{\%Q\{}{\}},%
6241   morestring=[s]{\%Q(}{)},%
6242   morestring=[s]{\%Q[}{]},%
6243   morestring=[s]{\%Q-}{-}%
6244   }[keywords,comments,strings]%
6245 %    \begin{macrocode}
6246 ⟨/lang2⟩
```

## 2.71   Scilab

Thanks go to Jean-Philippe Grivet.

```
6247 ⟨∗lang1⟩

6248 %%
6249 %% Scilab definition (c) 2002,2003 Jean-Philippe Grivet
6250 %%
6251 \lst@definelanguage{Scilab}%
6252   {morekeywords={abcd,abinv,abort,abs,acoshm,acosh,acosm,acos,addcolor,%
6253       addf,addinter,addmenu,add_edge,add_node,adj2sp,adj_lists,aff2ab,%
6254       amell,analpf,analyze,ans,apropos,arc_graph,arc_number,argn,arhnk,%
6255       arl2,arma2p,armac,armax1,armax,arma,arsimul,artest,articul,ascii,%
6256       asinhm,asinh,asinm,asin,atanhm,atanh,atanm,atan,augment,auread,%
6257       auwrite,balanc,balreal,bandwr,basename,bdiag,besseli,besselj,%
```

```
6258        besselk,bessely,best_match,bezout,bifish,bilin,binomial,black,%
6259        bloc2exp,bloc2ss,bode,bool2s,boolean,boucle,break,bstap,buttmag,%
6260        bvode,cainv,calerf,calfrq,call,canon,casc,case,ccontrg,cdfbet,%
6261        cdfbin,cdfchi,cdfchn,cdffnc,cdff,cdfgam,cdfnbn,cdfnor,cdfpoi,%
6262        cdft,ceil,center,cepstrum,chaintest,chain_struct,champ1,champ,%
6263        chart,chdir,cheb1mag,cheb2mag,check_graph,check_io,chepol,chfact,%
6264        chol,chsolve,circuit,classmarkov,clean,clearfun,clearglobal,%
6265        clear,close,cls2dls,cmb_lin,cmndred,cmoment,code2str,coeff,coffg,%
6266        coff,colcompr,colcomp,colinout,colormap,colregul,companion,comp,%
6267        cond,conj,connex,contour2di,contour2d,contourf,contour,%
6268        contract_edge,contrss,contr,cont_frm,cont_mat,convex_hull,convol,%
6269        convstr,con_nodes,copfac,copy,correl,corr,coshm,cosh,cosm,cos,%
6270        cotg,cothm,coth,covar,csim,cspect,ctr_gram,cumprod,cumsum,%
6271        curblock,cycle_basis,czt,c_link,dasrt,dassl,datafit,date,dbphi,%
6272        dcf,ddp,debug,dec2hex,deff,definedfields,degree,delbpt,%
6273        delete_arcs,delete_nodes,delete,delip,delmenu,demos,denom,%
6274        derivative,derivat,des2ss,des2tf,determ,detr,det,dft,dhinf,%
6275        dhnorm,diag,diary,diff,diophant,dirname,dispbpt,dispfiles,disp,%
6276        dlgamma,double,dragrect,drawaxis,drawlater,drawnow,draw,driver,%
6277        dscr,dsearch,dsimul,dtsi,dt_ility,duplicate,edge_number,%
6278        edit_curv,edit_graph_menus,edit_graph,edit,eigenmarkov,ell1mag,%
6279        elseif,else,emptystr,endfunction,end,eqfir,eqiir,equil1,equil,%
6280        ereduc,erfcx,erfc,erf,errbar,errcatch,errclear,error,eval3dp,%
6281        eval3d,eval,evans,evstr,excel2sci,execstr,exec,exists,exit,expm,%
6282        exp,external,eye,fac3d,factors,faurre,fchamp,fcontour2d,fcontour,%
6283        fec,feedback,feval,ffilt,fftshift,fft,fgrayplot,figure,fileinfo,%
6284        file,filter,findm,findobj,findx0BD,find_freq,find_path,find,%
6285        findABCD,findAC,findBD,findBDK,findR,fit_dat,fix,floor,flts,foo,%
6286        formatman,format,fort,for,fourplan,fplot2d,fplot3d1,fplot3d,%
6287        fprintf,fprintfMat,frep2tf,freq,freson,frexp,frfit,frmag,fscanf,%
6288        fscanfMat,fsfirlin,fsolve,fspecg,fstabst,fstair,ftest,ftuneq,%
6289        fullrfk,fullrf,full,fun2string,funcprot,functions,function,%
6290        funptr,fusee,gainplot,gamitg,gammaln,gamma,gcare,gcd,gcf,%
6291        genfac3d,genlib,genmarkov,gen_net,geom3d,geomean,getblocklabel,%
6292        getcolor,getcurblock,getcwd,getdate,getd,getenv,getfield,getfont,%
6293        getf,getio,getlinestyle,getmark,getpid,getscicosvars,getsymbol,%
6294        getvalue,getversion,get_function_path,get,gfare,gfrancis,girth,%
6295        givens,glever,glist,global,glue,gpeche,graduate,grand,%
6296        graphics_entities,graph_2_mat,graph_center,graph_complement,%
6297        graph_diameter,graph_power,graph_simp,graph_sum,graph_union,%
6298        graph-list,graycolormap,grayplot,graypolarplot,grep,group,%
6299        gr_menu,gschur,gsort,gspec,gstacksize,gtild,g_margin,h2norm,halt,%
6300        hamilton,hankelsv,hank,harmean,havewindow,help,hermit,hess,%
6301        hex2dec,hilb,hinf,hist3d,histplot,horner,host,hotcolormap,%
6302        householder,hrmt,htrianr,hypermat,h_cl,h_inf_st,h_inf,h_norm,%
6303        iconvert,icon_edit,ieee,if,iirgroup,iirlp,iir,ilib_build,%
6304        ilib_compile,ilib_for_link,ilib_gen_gateway,ilib_gen_loader,%
6305        ilib_gen_Make,imag,impl,imrep2ss,imult,im_inv,inistate,input,%
6306        int16,int2d,int32,int3d,int8,intc,intdec,integrate,interpln,%
6307        interp,intersci,intersect,intg,intl,intppty,intsplin,inttrap,%
```

```
6308    inttype,int,invr,invsyslin,inv_coeff,inv,iqr,isdef,isdir,isequal,%
6309    iserror,isglobal,isinf,isnan,isoview,isreal,is_connex,jmat,%
6310    justify,kalm,karmarkar,kernel,keyboard,knapsack,kpure,krac2,%
6311    kroneck,kron,lasterror,lattn,lattp,lcf,lcmdiag,lcm,ldivf,ldiv,%
6312    leastsq,legends,length,leqr,levin,lev,lex_sort,lft,lgfft,library,%
6313    lib,lin2mu,lincos,lindquist,lines,line_graph,linfn,linf,link,%
6314    linmeq,linpro,linsolve,linspace,lin,listfiles,list,lmisolver,%
6315    lmitool,loadmatfile,loadplots,loadwave,load_graph,load,locate,%
6316    log10,log1p,log2,logm,logspace,log,lotest,lqe,lqg2stan,lqg_ltr,%
6317    lqg,lqr,lsq,lsslist,lstcat,lstsize,ltitr,ludel,lufact,luget,%
6318    lusolve,lu,lyap,macglov,macr2lst,macrovar,macro,mad,make_graph,%
6319    make_index,manedit,man,mapsound,markp2ss,matfile2sci,matrix,%
6320    mat_2_graph,maxi,max_cap_path,max_clique,max_flow,max,mclearerr,%
6321    mclose,meanf,mean,median,meof,mese,mesh2d,mfft,mfile2sci,mgeti,%
6322    mgetl,mgetstr,mget,milk_drop,mine,mini,minreal,minss,%
6323    min_lcost_cflow,min_lcost_flow1,min_lcost_flow2,min_qcost_flow,%
6324    min_weight_tree,min,mlist,mode,modulo,moment,mopen,move,%
6325    mps2linpro,mputl,mputstr,mput,mrfit,msd,mseek,mtell,mtlb_load,%
6326    mtlb_mode,mtlb_save,mtlb_sparse,mu2lin,mulf,mvvacov,m_circle,%
6327    names,nand2mean,nanmax,nanmeanf,nanmean,nanmedian,nanmin,%
6328    nanstdev,nansum,narsimul,ndims,nearfloat,nehari,neighbors,%
6329    netclose,netwindows,netwindow,newest,newfun,nextpow2,nf3d,nfreq,%
6330    nlev,nnz,nodes_2_path,nodes_degrees,node_number,noisegen,norm,%
6331    null,numdiff,numer,nyquist,obscont1,obscont,observer,obsvss,%
6332    obsv_mat,obs_gram,odedc,odedi,odeoptions,ode_discrete,ode_root,%
6333    ode,oldload,oldsave,ones,optim,orth,param3d1,param3d,%
6334    paramfplot2d,parrot,part,pathconvert,path_2_nodes,pause,pbig,%
6335    pdiv,pen2ea,pencan,penlaur,perctl,perfect_match,pertrans,pfss,%
6336    phasemag,phc,pinv,pipe_network,playsnd,plot2d1,plot2d2,plot2d3,%
6337    plot2d4,plot2d,plot3d1,plot3d2,plot3d3,plot3d,plotframe,%
6338    plotprofile,plot_graph,plot,plzr,pmodulo,pol2des,pol2str,pol2tex,%
6339    polarplot,polar,polfact,poly,portr3d,portrait,power,ppol,prbs_a,%
6340    predecessors,predef,printf,printing,print,prod,profile,projsl,%
6341    projspec,proj,psmall,pspect,pvm_addhosts,pvm_barrier,pvm_bcast,%
6342    pvm_bufinfo,pvm_config,pvm_delhosts,pvm_error,pvm_exit,%
6343    pvm_f772sci,pvm_getinst,pvm_gettid,pvm_get_timer,pvm_gsize,%
6344    pvm_halt,pvm_joingroup,pvm_kill,pvm_lvgroup,pvm_mytid,pvm_parent,%
6345    pvm_probe,pvm_recv,pvm_reduce,pvm_sci2f77,pvm_send,pvm_set_timer,%
6346    pvm_spawn_independent,pvm_spawn,pvm_start,pvm_tasks,%
6347    pvm_tidtohost,pvm,pwd,p_margin,qassign,qr,quapro,quart,quaskro,%
6348    quit,randpencil,rand,range,rankqr,rank,rat,rcond,rdivf,read4b,%
6349    readb,readc_,readmps,read,real,recur,reglin,regress,remezb,remez,%
6350    repfreq,replot,residu,resume,return,riccati,riccsl,ricc,ric_desc,%
6351    rlist,roots,rotate,round,routh_t,rowcompr,rowcomp,rowinout,%
6352    rowregul,rowshuff,rpem,rref,rtitr,rubberbox,salesman,savewave,%
6353    save_graph,save,scaling,scanf,schur,sci2exp,sci2for,sci2map,%
6354    sciargs,scicosim,scicos,scifunc_block,sd2sci,secto3d,select,%
6355    semidef,sensi,setbpt,seteventhandler,setfield,setmenu,%
6356    setscicosvars,set,sfact,sgrid,shortest_path,showprofile,%
6357    show_arcs,show_graph,show_nodes,sident,signm,sign,simp_mode,simp,%
```

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```
6358        sincd,sinc,sinc,sinhm,sinh,sinm,sin,size,sm2des,sm2ss,smooth,%
6359        solve,sorder,sort,sound,sp2adj,spaninter,spanplus,spantwo,sparse,%
6360        spchol,spcompack,specfact,spec,speye,spget,splin,split_edge,%
6361        spones,sprand,sprintf,spzeros,sqroot,sqrtm,sqrt,squarewave,%
6362        square,srfaur,srkf,ss2des,ss2ss,ss2tf,sscanf,sskf,ssprint,ssrand,%
6363        stabil,stacksize,standard_define,standard_draw,standard_input,%
6364        standard_origin,standard_output,startup,stdevf,stdev,steadycos,%
6365        str2code,strange,strcat,strindex,strings,string,stripblanks,%
6366        strong_connex,strong_con_nodes,strsubst,st_deviation,st_ility,%
6367        subf,subgraph,subplot,successors,sum,supernode,sva,svd,svplot,%
6368        sylm,sylv,sysconv,sysdiag,sysfact,syslin,syssize,systems,system,%
6369        systmat,tabul,tangent,tanhm,tanh,tanm,tan,tdinit,testmatrix,%
6370        texprint,tf2des,tf2ss,then,thrownan,timer,time_id,titlepage,%
6371        tk_getdir,tk_getfile,tlist,toeplitz,tokenpos,tokens,trace,%
6372        translatepaths,trans_closure,trans,trfmod,trianfml,tril,trimmean,%
6373        trisolve,triu,trzeros,typename,typeof,type,uicontrol,uimenu,%
6374        uint16,uint32,uint8,ui_observer,ulink,unglue,union,unique,unix_g,%
6375        unix_s,unix_w,unix_x,unix,unobs,unsetmenu,user,varargin,%
6376        varargout,variancef,variance,varn,warning,wavread,wavwrite,%
6377        wcenter,wfir,what,whereami,whereis,where,while,whos,who_user,who,%
6378        wiener,wigner,window,winsid,with_gtk,with_pvm,with_texmacs,%
6379        with_tk,writb,write4b,write,xarcs,xarc,xarrows,xaxis,xbasc,%
6380        xbasimp,xbasr,xchange,xclear,xclea,xclick,xclip,xdel,xend,xfarcs,%
6381        xfarc,xfpolys,xfpoly,xfrect,xgetech,xgetfile,xgetmouse,xget,%
6382        xgraduate,xgrid,xinfo,xinit,xlfont,xload,xname,xnumb,xpause,%
6383        xpolys,xpoly,xrects,xrect,xrpoly,xs2fig,xs2gif,xs2ppm,xs2ps,%
6384        xsave,xsegs,select,xsetech,xsetm,xset,xstringb,xstringl,xstring,%
6385        xtape,xtitle,x_choices,x_choose,x_dialog,x_matrix,x_mdialog,%
6386        x_message_modeless,x_message,yulewalk,zeropen,zeros,zgrid,zpbutt,%
6387        zpch1,zpch2,zpell,mfprintf,mfscanf,mprintf,mscanf,msprintf,%
6388        msscanf,mucomp,%
6389        ABSBLK_f,AFFICH_f,ANDLOG_f,ANIMXY_f,BIGSOM_f,CLINDUMMY_f,CLKIN_f,%
6390        CLKINV_f,CLKOUT_f,CLKOUTV_f,CLKSOM_f,CLKSOMV_f,CLKSPLIT_f,%
6391        CLOCK_f,CLR_f,CLSS_f,CONST_f,COSBLK_f,CURV_f,DELAY_f,DELAYV_f,%
6392        DEMUX_f,DLR_f,DLRADAPT_f,DLSS_f,EVENTSCOPE_f,EVTDLY_f,EVTGEN_f,%
6393        EXPBLK_f,G_make,GAIN_f,GAINBLK_f,GENERAL_f,GENERIC_f,GENSIN_f,%
6394        GENSQR_f,HALT_f,IFTHEL_f,IN_f,INTEGRAL_f,INTRP2BLK_f,INTRPLBLK_f,%
6395        INVBLK_f,LOGBLK_f,LOOKUP_f,Matplot1,Matplot,MAX_f,MCLOCK_f,%
6396        MFCLCK_f,MIN_f,MUX_f,NDcost,NEGTOPOS_f,OUT_f,POSTONEG_f,POWBLK_f,%
6397        PROD_f,QUANT_f,RAND_f,READC_f,REGISTER_f,RELAY_f,RFILE_f,%
6398        ScilabEval,Sfgrayplot,Sgrayplot,SAMPLEHOLD_f,SAT_f,SAWTOOTH_f,%
6399        SCOPE_f,SCOPXY_f,SELECT_f,SINBLK_f,SOM_f,SPLIT_f,STOP_f,SUPER_f,%
6400        TANBLK_f,TCLSS_f,TEXT_f,TIME_f,TK_EvalFile,TK_EvalStr,TK_GetVar,%
6401        TK_SetVar,TRASH_f,WFILE_f,WRITEC_f,ZCROSS_f,%
6402        \%asn,\%helps,\%k,\%sn},%
6403    alsoletter=\%,% chmod
6404    sensitive,%
6405    morecomment=[l]//,%
6406    morestring=[b]",%
6407    morestring=[m]'%
```

```
6408    }[keywords,comments,strings]%
```

```
6409 ⟨/lang1⟩
```

## 2.72   SHELXL

Thanks to Aidan Philip Heerdegen for mailing this definition.

```
6410 ⟨*lang2⟩
```

```
6411 %%
6412 %% SHELXL definition (c) 1999 Aidan Philip Heerdegen
6413 %%
6414 \lst@definelanguage{SHELXL}%
6415    {morekeywords={TITL,CELL,ZERR,LATT,SYMM,SFAC,DISP,UNIT,LAUE,%
6416        REM,MORE,TIME,END,HKLF,OMIT,SHEL,BASF,TWIN,EXTI,SWAT,%
6417        MERG,SPEC,RESI,MOVE,ANIS,AFIX,HFIX,FRAG,FEND,EXYZ,EADP,%
6418        EQIV,OMIT,CONN,PART,BIND,FREE,DFIX,BUMP,SAME,SADI,CHIV,%
6419        FLAT,DELU,SIMU,DEFS,ISOR,SUMP,L.S.,CGLS,SLIM,BLOC,DAMP,%
6420        WGHT,FVAR,BOND,CONF,MPLA,RTAB,LIST,ACTA,SIZE,TEMP,WPDB,%
6421        FMAP,GRID,PLAN,MOLE},%
6422    sensitive=false,%
6423    alsoother=_,% Makes the syntax highlighting ignore the underscores
6424    morecomment=[l]{! },%
6425    }%
```

```
6426 ⟨/lang2⟩
```

## 2.73   Simula

Took data from

  • Günther Lamprecht: **Introduction to SIMULA 67**; Braunschweig;
    Wiesbaden: Vieweg, 1981

```
6427 ⟨*lang3⟩
```

```
6428 \lst@definelanguage[IBM]{Simula}[DEC]{Simula}{}%
```

```
6429 \lst@definelanguage[DEC]{Simula}[67]{Simula}%
6430    {morekeywords={and,eq,eqv,ge,gt,hidden,imp,le,long,lt,ne,not,%
6431        options,or,protected,short}%
6432    }%
```

```
6433 \lst@definelanguage[CII]{Simula}[67]{Simula}%
6434    {morekeywords={and,equiv,exit,impl,not,or,stop}}%
```

```
6435 \lst@definelanguage[67]{Simula}%
6436    {morekeywords={activate,after,array,at,before,begin,boolean,%
6437        character,class,comment,delay,detach,do,else,end,external,false,%
6438        for,go,goto,if,in,inner,inspect,integer,is,label,name,new,none,%
6439        notext,otherwise,prior,procedure,qua,reactivate,real,ref,resume,%
6440        simset,simulation,step,switch,text,then,this,to,true,until,value,%
6441        virtual,when,while},%
6442    sensitive=f,%
```

```
6443    keywordcommentsemicolon={end}{else,end,otherwise,when}{comment},%
6444    morestring=[d]",%
6445    morestring=[d]'%
6446  }[keywords,keywordcomments,strings]%
```

6447 ⟨/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.

6448 ⟨∗lang3⟩

```
6449 %%
6450 %% SPARQL definition (c) 2006 Christoph Kiefer
6451 %%
6452 \lst@definelanguage{SPARQL}%
6453    {morekeywords={BASE,PREFIX,SELECT,DISTINCT,CONSTRUCT,DESCRIBE,ASK,%
6454        FROM,NAMED,WHERE,ORDER,BY,ASC,DESC,LIMIT,OFFSET,OPTIONAL,%
6455        GRAPH,UNION,FILTER,a,STR,LANG,LANGMATCHES,DATATYPE,BOUND,%
6456        isIRI,isURI,isBLANK,isLITERAL,REGEX,true,false},%
6457    sensitive=false,%
6458    morecomment=[l]\#,%
6459    morestring=[d]',%
6460    morestring=[d]"%
6461  }[keywords,comments,strings]%
```

6462 ⟨/lang3⟩

## 2.75   SQL

Data come from Christian Haul. Neil Conway added some keywords, ditto Torsten Flatter, Robert Frank and Dirk Jesko.

6463 ⟨∗lang1⟩

```
6464 %%
6465 %% SQL definition (c) 1998 Christian Haul
6466 %%              (c) 2002 Neil Conway
6467 %%              (c) 2002 Robert Frank
6468 %%              (c) 2003 Dirk Jesko
6469 %%
6470 \lst@definelanguage{SQL}%
6471    {morekeywords={ABSOLUTE,ACTION,ADD,ALLOCATE,ALTER,ARE,AS,ASSERTION,%
6472        AT,BETWEEN,BIT_LENGTH,BOTH,BY,CASCADE,CASCADED,CASE,CAST,%
6473        CATALOG,CHAR_LENGTH,CHARACTER_LENGTH,CLUSTER,COALESCE,%
6474        COLLATE,COLLATION,COLUMN,CONNECT,CONNECTION,CONSTRAINT,%
6475        CONSTRAINTS,CONVERT,CORRESPONDING,CREATE,CROSS,CURRENT_DATE,%
6476        CURRENT_TIME,CURRENT_TIMESTAMP,CURRENT_USER,DAY,DEALLOCATE,%
6477        DEC,DEFERRABLE,DEFERED,DESCRIBE,DESCRIPTOR,DIAGNOSTICS,%
6478        DISCONNECT,DOMAIN,DROP,ELSE,END,EXEC,EXCEPT,EXCEPTION,EXECUTE,%
```

```
6479        EXTERNAL,EXTRACT,FALSE,FIRST,FOREIGN,FROM,FULL,GET,GLOBAL,%
6480        GRAPHIC,HAVING,HOUR,IDENTITY,IMMEDIATE,INDEX,INITIALLY,INNER,%
6481        INPUT,INSENSITIVE,INSERT,INTO,INTERSECT,INTERVAL,%
6482        ISOLATION,JOIN,KEY,LAST,LEADING,LEFT,LEVEL,LIMIT,LOCAL,LOWER,%
6483        MATCH,MINUTE,MONTH,NAMES,NATIONAL,NATURAL,NCHAR,NEXT,NO,NOT,NULL,%
6484        NULLIF,OCTET_LENGTH,ON,ONLY,ORDER,ORDERED,OUTER,OUTPUT,OVERLAPS,%
6485        PAD,PARTIAL,POSITION,PREPARE,PRESERVE,PRIMARY,PRIOR,READ,%
6486        RELATIVE,RESTRICT,REVOKE,RIGHT,ROWS,SCROLL,SECOND,SELECT,SESSION,%
6487        SESSION_USER,SIZE,SPACE,SQLSTATE,SUBSTRING,SYSTEM_USER,%
6488        TABLE,TEMPORARY,THEN,TIMEZONE_HOUR,%
6489        TIMEZONE_MINUTE,TRAILING,TRANSACTION,TRANSLATE,TRANSLATION,TRIM,%
6490        TRUE,UNIQUE,UNKNOWN,UPPER,USAGE,USING,VALUE,VALUES,%
6491        VARGRAPHIC,VARYING,WHEN,WHERE,WRITE,YEAR,ZONE,%
6492        AND,ASC,avg,CHECK,COMMIT,count,DECODE,DESC,DISTINCT,GROUP,IN,% FF
6493        LIKE,NUMBER,ROLLBACK,SUBSTR,sum,VARCHAR2,% FF
6494        MIN,MAX,UNION,UPDATE,% RF
6495        ALL,ANY,CUBE,CUBE,DEFAULT,DELETE,EXISTS,GRANT,OR,RECURSIVE,% DJ
6496        ROLE,ROLLUP,SET,SOME,TRIGGER,VIEW},% DJ
6497     morendkeywords={BIT,BLOB,CHAR,CHARACTER,CLOB,DATE,DECIMAL,FLOAT,% DJ
6498        INT,INTEGER,NUMERIC,SMALLINT,TIME,TIMESTAMP,VARCHAR},% moved here
6499     sensitive=false,% DJ
6500     morecomment=[l]--,%
6501     morecomment=[s]{/*}{*/},%
6502     morestring=[d]',%
6503     morestring=[d]"%
6504   }[keywords,comments,strings]%

6505 ⟨/lang1⟩
```

## 2.76   Swift

The definition for Swift was provided by Stefan Jager.

```
6506 ⟨*lang3⟩

6507 \lst@definelanguage{Swift}{%
6508     morekeywords={associatedtype,class,deinit,enum,extension,fileprivate,%
6509        func,import,init,inout,internal,let,open,operator,private,protocol,%
6510        public,static,struct,subscript,typealias,var,break,case,continue,%
6511        default,defer,do,else,fallthrough,for,guard,if,in,repeat,return,%
6512        switch,where,while,as,Any,catch,false,is,nil,rethrows,super,self,%
6513        Self,throw,throws,true,try,_,associativity,convenience,dynamic,%
6514        didSet,final,get,infix,indirect,lazy,left,mutating,none,%
6515        nonmutating,optional,override,postfix,precedence,prefix,Protocol,%
6516        required,right,set,Type,unowned,weak,willSet},%
6517     sensitive,%
6518     morecomment=[s]{/*}{*/},%
6519     morecomment=[s]{/**}{*/},%
6520     morecomment=[l]//,%
6521     morecomment=[l]///,%
6522     morestring=[b]",%
```

```
6523   morestring=[b]""",%
6524   moredelim=*[directive]\#,%
6525   moredirectives={available,colorLiteral,column,else,elseif,endif,file,%
6526     fileLiteral,function,if,imageLiteral,line,selector,sourceLocation}%
6527  }[keywords,comments,strings,directives]%
```

6528 ⟨/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.

6529 ⟨∗lang2⟩

```
6530 %%
6531 %% Tcl/Tk definition (c) Gerd Neugebauer
6532 %%
6533 \lst@definelanguage[tk]{tcl}[]{tcl}%
6534   {morekeywords={activate,add,separator,radiobutton,checkbutton,%
6535       command,cascade,all,bell,bind,bindtags,button,canvas,canvasx,%
6536       canvasy,cascade,cget,checkbutton,config,configu,configur,%
6537       configure,clipboard,create,arc,bitmap,image,line,oval,polygon,%
6538       rectangle,text,textwindow,curselection,delete,destroy,end,entry,%
6539       entrycget,event,focus,font,actual,families,measure,metrics,names,%
6540       frame,get,grab,current,release,status,grid,columnconfigure,%
6541       rowconfigure,image,image,create,bitmap,photo,delete,height,types,%
6542       widt,names,index,insert,invoke,itemconfigure,label,listbox,lower,%
6543       menu,menubutton,message,move,option,add,clear,get,readfile,pack,%
6544       photo,place,radiobutton,raise,scale,scroll,scrollbar,search,see,%
6545       selection,send,stdin,stdout,stderr,tag,bind,text,tk,tkerror,%
6546       tkwait,window,variable,visibility,toplevel,unknown,update,winfo,%
6547       class,exists,ismapped,parent,reqwidth,reqheight,rootx,rooty,%
6548       width,height,wm,aspect,client,command,deiconify,focusmodel,frame,%
6549       geometry,group,iconbitmap,iconify,iconmask,iconname,iconposition,%
6550       iconwindow,maxsize,minsize,overrideredirect,positionfrom,%
6551       protocol,sizefrom,state,title,transient,withdraw,xview,yview,%
6552       yposition,%
6553       -accelerator,-activebackground,-activeborderwidth,%
6554       -activeforeground,-after,-anchor,-arrow,-arrowshape,-aspect,%
6555       -async,-background,-before,-bg,-bigincrement,-bitmap,-bordermode,%
6556       -borderwidth,-button,-capstyle,-channel,-class,-closeenough,%
6557       -colormap,-column,-columnspan,-command,-confine,-container,%
```

```
6558        -count,-cursor,-data,-default,-detail,-digits,-direction,%
6559        -displayof,-disableforeground,-elementborderwidth,-expand,%
6560        -exportselection,-extend,-family,-fg,-file,-fill,-focus,-font,%
6561        -fontmap,-foreground,-format,-from,-gamma,-global,-height,%
6562        -highlightbackground,-highlightcolor,-highlightthickness,-icon,%
6563        -image,-in,-insertbackground,-insertborderwidth,-insertofftime,%
6564        -insertontime,-imsertwidth,-ipadx,-ipady,-joinstyle,-jump,%
6565        -justify,-keycode,-keysym,-label,-lastfor,-length,-maskdata,%
6566        -maskfile,-menu,-message,-mode,-offvalue,-onvalue,-orient,%
6567        -outlien,-outlinestipple,-overstrike,-override,-padx,-pady,%
6568        -pageanchor,-pageheight,-pagewidth,-pagey,-pagey,-palette,%
6569        -parent,-place,-postcommand,-relheight,-relief,-relwidth,-relx,%
6570        -rely,-repeatdelay,-repeatinterval,-resolution,-root,-rootx,%
6571        -rooty,-rotate,-row,-rowspan,-screen,-selectcolor,-selectimage,%
6572        -sendevent,-serial,-setgrid,-showvalue,-shrink,-side,-size,%
6573        -slant,-sliderlength,-sliderrelief,-smooth,-splinesteps,-state,%
6574        -sticky,-stipple,-style,-subsample,-subwindow,-tags,-takefocus,%
6575        -tearoff,-tearoffcommand,-text,-textvariable,-tickinterval,-time,%
6576        -title,-to,-troughcolor,-type,-underline,-use,-value,-variable,%
6577        -visual,-width,-wrap,-wraplength,-x,-xscrollcommand,-y,%
6578        -bgstipple,-fgstipple,-lmargin1,-lmargin2,-rmargin,-spacing1,%
6579        -spacing2,-spacing3,-tabs,-yscrollcommand,-zoom,%
6580        activate,add,addtag,bbox,cget,clone,configure,coords,%
6581        curselection,debug,delete,delta,deselect,dlineinfo,dtag,dump,%
6582        entrycget,entryconfigure,find,flash,fraction,get,gettags,handle,%
6583        icursor,identify,index,insert,invoke,itemcget,itemconfigure,mark,%
6584        moveto,own,post,postcascade,postscript,put,redither,ranges,%
6585        scale,select,show,tag,type,unpost,xscrollcommand,xview,%
6586        yscrollcommand,yview,yposition}%
6587    }%
6588 \lst@definelanguage[]{tcl}%
6589    {alsoletter={.:,*=&-},%
6590     morekeywords={after,append,array,names,exists,anymore,donesearch,%
6591        get,nextelement,set,size,startsearch,auto_mkindex,binary,break,%
6592        case,catch,cd,clock,close,concat,console,continue,default,else,%
6593        elseif,eof,error,eval,exec,-keepnewline,exit,expr,fblocked,%
6594        fconfigure,fcopy,file,atime,dirname,executable,exists,extension,%
6595        isdirectory,isfile,join,lstat,mtime,owned,readable,readlink,%
6596        rootname,size,stat,tail,type,writable,-permissions,-group,-owner,%
6597        -archive,-hidden,-readonly,-system,-creator,-type,-force,%
6598        fileevent,flush,for,foreach,format,gets,glob,global,history,if,%
6599        incr,info,argsbody,cmdcount,commands,complete,default,exists,%
6600        globals,level,library,locals,patchlevel,procs,script,tclversion,%
6601        vars,interp,join,lappend,lindex,linsert,list,llength,lrange,%
6602        lreplace,lsearch,-exact,-regexp,-glob,lsort,-ascii,-integer,%
6603        -real,-dictionary,-increasing,-decreasing,-index,-command,load,%
6604        namespace,open,package,forget,ifneeded,provide,require,unknown,%
6605        vcompare,versions,vsatisfies,pid,proc,puts,-nonewline,pwd,read,%
6606        regexp,-indices,regsub,-all,-nocaserename,return,scan,seek,set,%
```

```
6607        socket,source,split,string,compare,first,index,last,length,match,%
6608        range,tolower,toupper,trim,trimleft,trimright,subst,switch,tell,%
6609        time,trace,variable,vdelete,vinfo,unknown,unset,uplevel,upvar,%
6610        vwait,while,acos,asin,atan,atan2,ceil,cos,cosh,exp,floor,fmod,%
6611        hypot,log,log10,pow,sin,sinh,sqrt,tan,tanh,abs,double,int,round%
6612        },%
6613    morestring=[d]",%
6614    morecomment=[f]\#,%
6615    morecomment=[l]{;\#},%
6616    morecomment=[l]{[\#},%
6617    morecomment=[l]{\{\#}%
6618    }[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.

```
6619 ⟨/lang2⟩
```

## 2.78   Statistical languages

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

```
6620 ⟨∗lang3⟩
```

```
6621 \lst@definelanguage{S}[]{R}{}
6622 \lst@definelanguage[PLUS]{S}[]{R}{}
6623 \lst@definelanguage{R}%
6624    {keywords={abbreviate,abline,abs,acos,acosh,action,add1,add,%
6625        aggregate,alias,Alias,alist,all,anova,any,aov,aperm,append,apply,%
6626        approx,approxfun,apropos,Arg,args,array,arrows,as,asin,asinh,%
6627        atan,atan2,atanh,attach,attr,attributes,autoload,autoloader,ave,%
6628        axis,backsolve,barplot,basename,besselI,besselJ,besselK,besselY,%
6629        beta,binomial,body,box,boxplot,break,browser,bug,builtins,bxp,by,%
6630        c,C,call,Call,case,cat,category,cbind,ceiling,character,char,%
6631        charmatch,check,chol,chol2inv,choose,chull,class,close,cm,codes,%
6632        coef,coefficients,co,col,colnames,colors,colours,commandArgs,%
6633        comment,complete,complex,conflicts,Conj,contents,contour,%
6634        contrasts,contr,control,helmert,contrib,convolve,cooks,coords,%
6635        distance,coplot,cor,cos,cosh,count,fields,cov,covratio,wt,CRAN,%
6636        create,crossprod,cummax,cummin,cumprod,cumsum,curve,cut,cycle,D,%
6637        data,dataentry,date,dbeta,dbinom,dcauchy,dchisq,de,debug,%
6638        debugger,Defunct,default,delay,delete,deltat,demo,de,density,%
6639        deparse,dependencies,Deprecated,deriv,description,detach,%
6640        dev2bitmap,dev,cur,deviance,off,prev,,dexp,df,dfbetas,dffits,%
6641        dgamma,dgeom,dget,dhyper,diag,diff,digamma,dim,dimnames,dir,%
6642        dirname,dlnorm,dlogis,dnbinom,dnchisq,dnorm,do,dotplot,double,%
6643        download,dpois,dput,drop,drop1,dsignrank,dt,dummy,dump,dunif,%
6644        duplicated,dweibull,dwilcox,dyn,edit,eff,effects,eigen,else,%
6645        emacs,end,environment,env,erase,eval,equal,evalq,example,exists,%
6646        exit,exp,expand,expression,External,extract,extractAIC,factor,%
6647        fail,family,fft,file,filled,find,fitted,fivenum,fix,floor,for,%
```

```
6648        For,formals,format,formatC,formula,Fortran,forwardsolve,frame,%
6649        frequency,ftable,ftable2table,function,gamma,Gamma,gammaCody,%
6650        gaussian,gc,gcinfo,gctorture,get,getenv,geterrmessage,getOption,%
6651        getwd,gl,glm,globalenv,gnome,GNOME,graphics,gray,grep,grey,grid,%
6652        gsub,hasTsp,hat,heat,help,hist,home,hsv,httpclient,I,identify,if,%
6653        ifelse,Im,image,\%in\%,index,influence,measures,inherits,install,%
6654        installed,integer,interaction,interactive,Internal,intersect,%
6655        inverse,invisible,IQR,is,jitter,kappa,kronecker,labels,lapply,%
6656        layout,lbeta,lchoose,lcm,legend,length,levels,lgamma,library,%
6657        licence,license,lines,list,lm,load,local,locator,log,log10,log1p,%
6658        log2,logical,loglin,lower,lowess,ls,lsfit,lsf,ls,machine,Machine,%
6659        mad,mahalanobis,make,link,margin,match,Math,matlines,mat,matplot,%
6660        matpoints,matrix,max,mean,median,memory,menu,merge,methods,min,%
6661        missing,Mod,mode,model,response,mosaicplot,mtext,mvfft,na,nan,%
6662        names,omit,nargs,nchar,ncol,NCOL,new,next,NextMethod,nextn,%
6663        nlevels,nlm,noquote,NotYetImplemented,NotYetUsed,nrow,NROW,null,%
6664        numeric,\%o\%,objects,offset,old,on,Ops,optim,optimise,optimize,%
6665        options,or,order,ordered,outer,package,packages,page,pairlist,%
6666        pairs,palette,panel,par,parent,parse,paste,path,pbeta,pbinom,%
6667        pcauchy,pchisq,pentagamma,persp,pexp,pf,pgamma,pgeom,phyper,pico,%
6668        pictex,piechart,Platform,plnorm,plogis,plot,pmatch,pmax,pmin,%
6669        pnbinom,pnchisq,pnorm,points,poisson,poly,polygon,polyroot,pos,%
6670        postscript,power,ppoints,ppois,predict,preplot,pretty,Primitive,%
6671        print,prmatrix,proc,prod,profile,proj,prompt,prop,provide,%
6672        psignrank,ps,pt,ptukey,punif,pweibull,pwilcox,q,qbeta,qbinom,%
6673        qcauchy,qchisq,qexp,qf,qgamma,qgeom,qhyper,qlnorm,qlogis,qnbinom,%
6674        qnchisq,qnorm,qpois,qqline,qqnorm,qqplot,qr,Q,qty,qy,qsignrank,%
6675        qt,qtukey,quantile,quasi,quit,qunif,quote,qweibull,qwilcox,%
6676        rainbow,range,rank,rbeta,rbind,rbinom,rcauchy,rchisq,Re,read,csv,%
6677        csv2,fwf,readline,socket,real,Recall,rect,reformulate,regexpr,%
6678        relevel,remove,rep,repeat,replace,replications,report,require,%
6679        resid,residuals,restart,return,rev,rexp,rf,rgamma,rgb,rgeom,R,%
6680        rhyper,rle,rlnorm,rlogis,rm,rnbinom,RNGkind,rnorm,round,row,%
6681        rownames,rowsum,rpois,rsignrank,rstandard,rstudent,rt,rug,runif,%
6682        rweibull,rwilcox,sample,sapply,save,scale,scan,scan,screen,sd,se,%
6683        search,searchpaths,segments,seq,sequence,setdiff,setequal,set,%
6684        setwd,show,sign,signif,sin,single,sinh,sink,solve,sort,source,%
6685        spline,splinefun,split,sqrt,stars,start,stat,stem,step,stop,%
6686        storage,strstrheight,stripplot,strsplit,structure,strwidth,sub,%
6687        subset,substitute,substr,substring,sum,summary,sunflowerplot,svd,%
6688        sweep,switch,symbol,symbols,symnum,sys,status,system,t,table,%
6689        tabulate,tan,tanh,tapply,tempfile,terms,terrain,tetragamma,text,%
6690        time,title,topo,trace,traceback,transform,tri,trigamma,trunc,try,%
6691        ts,tsp,typeof,unclass,undebug,undoc,union,unique,uniroot,unix,%
6692        unlink,unlist,unname,untrace,update,upper,url,UseMethod,var,%
6693        variable,vector,Version,vi,warning,warnings,weighted,weights,%
6694        which,while,window,write,\%x\%,x11,X11,xedit,xemacs,xinch,xor,%
6695        xpdrows,xy,xyinch,yinch,zapsmall,zip},%
6696    otherkeywords={!,!=,~,$,*,\&,\%/\%,\%*\%,\%\%,<-,<<-,_,/},%
6697    alsoother={._$},%
```

```
6698    sensitive,%
6699    morecomment=[l]\#,%
6700    morestring=[d]",%
6701    morestring=[d]'% 2001 Robert Denham
6702    }%
```

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

```
6703 \lst@definelanguage{SAS}%
6704    {procnamekeys={proc},%
6705    morekeywords={DATA,AND,OR,NOT,EQ,GT,LT,GE,LE,NE,INFILE,INPUT,DO,BY,%
6706        TO,SIN,COS,OUTPUT,END,PLOT,RUN,LIBNAME,VAR,TITLE,FIRSTOBS,OBS,%
6707        DELIMITER,DLM,EOF,ABS,DIM,HBOUND,LBOUND,MAX,MIN,MOD,SIGN,SQRT,%
6708        CEIL,FLOOR,FUZZ,INT,ROUND,TRUNC,DIGAMMA,ERF,ERFC,EXP,GAMMA,%
6709        LGAMMA,LOG,LOG2,LOG10,ARCOS,ARSIN,ATAN,COSH,SINH,TANH,TAN,%
6710        POISSON,PROBBETA,PROBBNML,PROBCHI,PROBF,PROBGAM,PROBHYPR,%
6711        PROBNEGB,PROBNORM,PROBT,BETAINV,CINV,FINV,GAMINV,PROBIT,TINV,CSS,%
6712        CV,KURTOSIS,MEAN,NMISS,RANGE,SKEWNESS,STD,STDERR,SUM,USS,NORMAL,%
6713        RANBIN,RANCAU,RANEXP,RANGAM,RANNOR,RANPOI,RANTBL,RANTRI,RANUNI,%
6714        UNIFORM,IF,THEN,ELSE,WHILE,UNTIL,DROP,KEEP,LABEL,DEFAULT,ARRAY,%
6715        MERGE,CARDS,CARDS4,PUT,SET,UPDATE,ABORT,DELETE,DISPLAY,LIST,%
6716        LOSTCARD,MISSING,STOP,WHERE,ARRAY,DROP,KEEP,WINDOW,LENGTH,RENAME,%
6717        RETAIN,MEANS,UNIVARIATE,SUMMARY,TABULATE,CORR,FREQ,FOOTNOTE,NOTE,%
6718        SHOW},%
6719    otherkeywords={!,!=,~,$,*,\&,_,/,<,>=,=<,>},%
6720    morestring=[d]'%
6721    }[keywords,comments,strings,procnames]%
```

6722 ⟨/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.

6723 ⟨*lang3⟩

```
6724 \lst@definelanguage[AlLaTeX]{TeX}[LaTeX]{TeX}%
6725    {moretexcs={AtBeginDocument,AtBeginDvi,AtEndDocument,AtEndOfClass,%
6726        AtEndOfPackage,ClassError,ClassInfo,ClassWarning,%
6727        ClassWarningNoLine,CurrentOption,DeclareErrorFont,%
6728        DeclareFixedFont,DeclareFontEncoding,DeclareFontEncodingDefaults,%
6729        DeclareFontFamily,DeclareFontShape,DeclareFontSubstitution,%
6730        DeclareMathAccent,DeclareMathAlphabet,DeclareMathAlphabet,%
6731        DeclareMathDelimiter,DeclareMathRadical,DeclareMathSizes,%
6732        DeclareMathSymbol,DeclareMathVersion,DeclareOldFontCommand,%
6733        DeclareOption,DeclarePreloadSizes,DeclareRobustCommand,%
6734        DeclareSizeFunction,DeclareSymbolFont,DeclareSymbolFontAlphabet,%
6735        DeclareTextAccent,DeclareTextAccentDefault,DeclareTextCommand,%
6736        DeclareTextCommandDefault,DeclareTextComposite,%
6737        DeclareTextCompositeCommand,DeclareTextFontCommand,%
```

```
6738        DeclareTextSymbol,DeclareTextSymbolDefault,ExecuteOptions,%
6739        GenericError,GenericInfo,GenericWarning,IfFileExists,%
6740        InputIfFileExists,LoadClass,LoadClassWithOptions,MessageBreak,%
6741        OptionNotUsed,PackageError,PackageInfo,PackageWarning,%
6742        PackageWarningNoLine,PassOptionsToClass,PassOptionsToPackage,%
6743        ProcessOptionsProvidesClass,ProvidesFile,ProvidesFile,%
6744        ProvidesPackage,ProvideTextCommand,RequirePackage,%
6745        RequirePackageWithOptions,SetMathAlphabet,SetSymbolFont,%
6746        TextSymbolUnavailable,UseTextAccent,UseTextSymbol},%
6747     morekeywords={array,center,displaymath,document,enumerate,eqnarray,%
6748        equation,flushleft,flushright,itemize,list,lrbox,math,minipage,%
6749        picture,sloppypar,tabbing,tabular,trivlist,verbatim}%
6750    }%
6751 \lst@definelanguage[LaTeX]{TeX}[common]{TeX}%
6752    {moretexcs={a,AA,aa,addcontentsline,addpenalty,addtocontents,%
6753        addtocounter,addtolength,addtoversion,addvspace,alph,Alph,and,%
6754        arabic,array,arraycolsep,arrayrulewidth,arraystretch,author,%
6755        baselinestretch,begin,bezier,bfseries,bibcite,bibdata,bibitem,%
6756        bibliography,bibliographystyle,bibstyle,bigskip,boldmath,%
6757        botfigrule,bottomfraction,Box,caption,center,CheckCommand,circle,%
6758        citation,cite,cleardoublepage,clearpage,cline,columnsep,%
6759        columnseprule,columnwidth,contentsline,dashbox,date,dblfigrule,%
6760        dblfloatpagefraction,dblfloatsep,dbltextfloatsep,dbltopfraction,%
6761        defaultscriptratio,defaultscriptscriptratio,depth,Diamond,%
6762        displaymath,document,documentclass,documentstyle,doublerulesep,%
6763        em,emph,endarray,endcenter,enddisplaymath,enddocument,%
6764        endenumerate,endeqnarray,endequation,endflushleft,endflushright,%
6765        enditemize,endlist,endlrbox,endmath,endminipage,endpicture,%
6766        endsloppypar,endtabbing,endtabular,endtrivlist,endverbatim,%
6767        enlargethispage,ensuremath,enumerate,eqnarray,equation,%
6768        evensidemargin,extracolsep,fbox,fboxrule,fboxsep,filecontents,%
6769        fill,floatpagefraction,floatsep,flushbottom,flushleft,flushright,%
6770        fnsymbol,fontencoding,fontfamily,fontseries,fontshape,fontsize,%
6771        fontsubfuzz,footnotemark,footnotesep,footnotetext,footskip,frac,%
6772        frame,framebox,fussy,glossary,headheight,headsep,height,hline,%
6773        hspace,I,include,includeonly,index,inputlineno,intextsep,%
6774        itemindent,itemize,itemsep,iterate,itshape,Join,kill,label,%
6775        labelsep,labelwidth,LaTeX,LaTeXe,leadsto,lefteqn,leftmargin,%
6776        leftmargini,leftmarginii,leftmarginiii,leftmarginiv,leftmarginv,%
6777        leftmarginvi,leftmark,lhd,lim,linebreak,linespread,linethickness,%
6778        linewidth,list,listfiles,listfiles,listparindent,lrbox,%
6779        makeatletter,makeatother,makebox,makeglossary,makeindex,%
6780        makelabel,MakeLowercase,MakeUppercase,marginpar,marginparpush,%
6781        marginparsep,marginparwidth,markboth,markright,math,mathbf,%
6782        mathellipsis,mathgroup,mathit,mathrm,mathsf,mathsterling,mathtt,%
6783        mathunderscore,mathversion,mbox,mdseries,mho,minipage,%
6784        multicolumn,multiput,NeedsTeXFormat,newcommand,newcounter,%
6785        newenvironment,newfont,newhelp,newlabel,newlength,newline,%
6786        newmathalphabet,newpage,newsavebox,newtheorem,nobreakspace,%
```

```
6787        nobreakspace,nocite,nocorr,nocorrlist,nofiles,nolinebreak,%
6788        nonumber,nopagebreak,normalcolor,normalfont,normalmarginpar,%
6789        numberline,obeycr,oddsidemargin,oldstylenums,onecolumn,oval,%
6790        pagebreak,pagenumbering,pageref,pagestyle,paperheight,paperwidth,%
6791        paragraphmark,parbox,parsep,partopsep,picture,poptabs,pounds,%
6792        protect,pushtabs,put,qbezier,qbeziermax,r,raggedleft,raisebox,%
6793        ref,refstepcounter,renewcommand,renewenvironment,restorecr,%
6794        reversemarginpar,rhd,rightmargin,rightmark,rmfamily,roman,Roman,%
6795        rootbox,rule,samepage,sbox,scshape,secdef,section,sectionmark,%
6796        selectfont,setcounter,settodepth,settoheight,settowidth,sffamily,%
6797        shortstack,showoutput,showoverfull,sloppy,sloppypar,slshape,%
6798        smallskip,sqsubset,sqsupset,SS,stackrel,stepcounter,stop,stretch,%
6799        subparagraphmark,subsectionmark,subsubsectionmark,sum,%
6800        suppressfloats,symbol,tabbing,tabbingsep,tabcolsep,tabular,%
6801        tabularnewline,textasciicircum,textasciitilde,textbackslash,%
6802        textbar,textbf,textbraceleft,textbraceright,textbullet,%
6803        textcircled,textcompwordmark,textdagger,textdaggerdbl,textdollar,%
6804        textellipsis,textemdash,textendash,textexclamdown,textfloatsep,%
6805        textfraction,textgreater,textheight,textit,textless,textmd,%
6806        textnormal,textparagraph,textperiodcentered,textquestiondown,%
6807        textquotedblleft,textquotedblright,textquoteleft,textquoteright,%
6808        textregistered,textrm,textsc,textsection,textsf,textsl,%
6809        textsterling,textsuperscript,texttrademark,texttt,textunderscore,%
6810        textup,textvisiblespace,textwidth,thanks,thefootnote,thempfn,%
6811        thempfn,thempfootnote,thepage,thepage,thicklines,thinlines,%
6812        thispagestyle,title,today,topfigrule,topfraction,topmargin,%
6813        topsep,totalheight,tracingfonts,trivlist,ttfamily,twocolumn,%
6814        typein,typeout,unboldmath,unitlength,unlhd,unrhd,upshape,usebox,%
6815        usecounter,usefont,usepackage,value,vector,verb,verbatim,vline,%
6816        vspace,width,%
6817        normalsize,small,footnotesize,scriptsize,tiny,large,Large,LARGE,%
6818        huge,Huge}%
6819    }%

6820 \lst@definelanguage[plain]{TeX}[common]{TeX}%
6821    {moretexcs={advancepageno,beginsection,bf,bffam,bye,cal,cleartabs,%
6822        columns,dosupereject,endinsert,eqalign,eqalignno,fiverm,fivebf,%
6823        fivei,fivesy,folio,footline,hang,headline,it,itemitem,itfam,%
6824        leqalignno,magnification,makefootline,makeheadline,midinsert,mit,%
6825        mscount,nopagenumbers,normalbottom,of,oldstyle,pagebody,%
6826        pagecontents,pageinsert,pageno,plainoutput,preloaded,proclaim,rm,%
6827        settabs,sevenbf,seveni,sevensy,sevenrm,sl,slfam,supereject,%
6828        tabalign,tabs,tabsdone,tabsyet,tenbf,tenex,teni,tenit,tenrm,%
6829        tensl,tensy,tentt,textindent,topglue,topins,topinsert,tt,ttfam,%
6830        ttraggedright,vfootnote}%
6831    }%
```

The following language is only a helper.

```
6832 \lst@definelanguage[common]{TeX}[primitive]{TeX}
6833    {moretexcs={active,acute,ae,AE,aleph,allocationnumber,allowbreak,%
6834        alpha,amalg,angle,approx,arccos,arcsin,arctan,arg,arrowvert,%
```

```
6835        Arrowvert,ast,asymp,b,backslash,bar,beta,bgroup,big,Big,bigbreak,%
6836        bigcap,bigcirc,bigcup,bigg,Bigg,biggl,Biggl,biggm,Biggm,biggr,%
6837        Biggr,bigl,Bigl,bigm,Bigm,bigodot,bigoplus,bigotimes,bigr,Bigr,%
6838        bigskip,bigskipamount,bigsqcup,bigtriangledown,bigtriangleup,%
6839        biguplus,bigvee,bigwedge,bmod,bordermatrix,bot,bowtie,brace,%
6840        braceld,bracelu,bracerd,braceru,bracevert,brack,break,breve,%
6841        buildrel,bullet,c,cap,cases,cdot,cdotp,cdots,centering,%
6842        centerline,check,chi,choose,circ,clubsuit,colon,cong,coprod,%
6843        copyright,cos,cosh,cot,coth,csc,cup,d,dag,dagger,dashv,ddag,%
6844        ddagger,ddot,ddots,deg,delta,Delta,det,diamond,diamondsuit,dim,%
6845        displaylines,div,do,dospecials,dot,doteq,dotfill,dots,downarrow,%
6846        Downarrow,downbracefill,egroup,eject,ell,empty,emptyset,endgraf,%
6847        endline,enskip,enspace,epsilon,equiv,eta,exists,exp,filbreak,%
6848        flat,fmtname,fmtversion,footins,footnote,footnoterule,forall,%
6849        frenchspacing,frown,gamma,Gamma,gcd,ge,geq,gets,gg,goodbreak,%
6850        grave,H,hat,hbar,heartsuit,hglue,hideskip,hidewidth,hom,%
6851        hookleftarrow,hookrightarrow,hphantom,hrulefill,i,ialign,iff,Im,%
6852        imath,in,inf,infty,int,interdisplaylinepenalty,%
6853        interfootnotelinepenalty,intop,iota,item,j,jmath,joinrel,jot,%
6854        kappa,ker,l,L,lambda,Lambda,land,langle,lbrace,lbrack,lceil,%
6855        ldotp,ldots,le,leavevmode,leftarrow,Leftarrow,leftarrowfill,%
6856        leftharpoondown,leftharpoonup,leftline,leftrightarrow,%
6857        Leftrightarrow,leq,lfloor,lg,lgroup,lhook,lim,liminf,limsup,line,%
6858        ll,llap,lmoustache,ln,lnot,log,longleftarrow,Longleftarrow,%
6859        longleftrightarrow,Longleftrightarrow,longmapsto,longrightarrow,%
6860        Longrightarrow,loop,lor,lq,magstep,magstep,magstephalf,mapsto,%
6861        mapstochar,mathhexbox,mathpalette,mathstrut,matrix,max,maxdimen,%
6862        medbreak,medskip,medskipamount,mid,min,models,mp,mu,multispan,%
6863        nabla,narrower,natural,ne,nearrow,neg,negthinspace,neq,newbox,%
6864        newcount,newdimen,newfam,newif,newinsert,newlanguage,newmuskip,%
6865        newread,newskip,newtoks,newwrite,next,ni,nobreak,nointerlineskip,%
6866        nonfrenchspacing,normalbaselines,normalbaselineskip,%
6867        normallineskip,normallineskiplimit,not,notin,nu,null,nwarrow,o,O,%
6868        oalign,obeylines,obeyspaces,odot,oe,OE,offinterlineskip,oint,%
6869        ointop,omega,Omega,ominus,ooalign,openup,oplus,oslash,otimes,%
6870        overbrace,overleftarrow,overrightarrow,owns,P,parallel,partial,%
6871        perp,phantom,phi,Phi,pi,Pi,pm,pmatrix,pmod,Pr,prec,preceq,prime,%
6872        prod,propto,psi,Psi,qquad,quad,raggedbottom,raggedright,rangle,%
6873        rbrace,rbrack,rceil,Re,relbar,Relbar,removelastskip,repeat,%
6874        rfloor,rgroup,rho,rhook,rightarrow,Rightarrow,rightarrowfill,%
6875        rightharpoondown,rightharpoonup,rightleftharpoons,rightline,rlap,%
6876        rmoustache,root,rq,S,sb,searrow,sec,setminus,sharp,showhyphens,%
6877        sigma,Sigma,sim,simeq,sin,sinh,skew,slash,smallbreak,smallint,%
6878        smallskip,smallskipamount,smash,smile,sp,space,spadesuit,sqcap,%
6879        sqcup,sqrt,sqsubseteq,sqsupseteq,ss,star,strut,strutbox,subset,%
6880        subseteq,succ,succeq,sum,sup,supset,supseteq,surd,swarrow,t,tan,%
6881        tanh,tau,TeX,theta,Theta,thinspace,tilde,times,to,top,tracingall,%
6882        triangle,triangleleft,triangleright,u,underbar,underbrace,%
6883        uparrow,Uparrow,upbracefill,updownarrow,Updownarrow,uplus,%
6884        upsilon,Upsilon,v,varepsilon,varphi,varpi,varrho,varsigma,%
```

```
6885        vartheta,vdash,vdots,vec,vee,vert,Vert,vglue,vphantom,wedge,%
6886        widehat,widetilde,wlog,wp,wr,xi,Xi,zeta}%
6887    }%
```

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

```
6888 \lst@definelanguage[primitive]{TeX}%
6889    {moretexcs={above,abovedisplayshortskip,abovedisplayskip,aftergroup,%
6890        abovewithdelims,accent,adjdemerits,advance,afterassignment,atop,%
6891        atopwithdelims,badness,baselineskip,batchmode,begingroup,%
6892        belowdisplayshortskip,belowdisplayskip,binoppenalty,botmark,box,%
6893        boxmaxdepth,brokenpenalty,catcode,char,chardef,cleaders,closein,%
6894        closeout,clubpenalty,copy,count,countdef,cr,crcr,csname,day,%
6895        deadcycles,def,defaulthyphenchar,defaultskewchar,delcode,%
6896        delimiter,delimiterfactor,delimitershortfall,dimen,dimendef,%
6897        discretionary,displayindent,displaylimits,displaystyle,%
6898        displaywidowpenalty,displaywidth,divide,doublehyphendemerits,dp,%
6899        edef,else,emergencystretch,end,endcsname,endgroup,endinput,%
6900        endlinechar,eqno,errhelp,errmessage,errorcontextlines,%
6901        errorstopmode,escapechar,everycr,everydisplay,everyhbox,everyjob,%
6902        everymath,everypar,everyvbox,exhyphenpenalty,expandafter,fam,fi,%
6903        finalhypendemerits,firstmark,floatingpenalty,font,fontdimen,%
6904        fontname,futurelet,gdef,global,globaldefs,halign,hangafter,%
6905        hangindent,hbadness,hbox,hfil,hfill,hfilneg,hfuzz,hoffset,%
6906        holdinginserts,hrule,hsize,hskip,hss,ht,hyphenation,hyphenchar,%
6907        hyphenpenalty,if,ifcase,ifcat,ifdim,ifeof,iffalse,ifhbox,ifhmode,%
6908        ifinner,ifmmode,ifnum,ifodd,iftrue,ifvbox,ifvmode,ifvoid,ifx,%
6909        ignorespaces,immediate,indent,input,insert,insertpenalties,%
6910        interlinepenalty,jobname,kern,language,lastbox,lastkern,%
6911        lastpenalty,lastskip,lccode,leaders,left,lefthyphenmin,leftskip,%
6912        leqno,let,limits,linepenalty,lineskip,lineskiplimit,long,%
6913        looseness,lower,lowercase,mag,mark,mathaccent,mathbin,mathchar,%
6914        mathchardef,mathchoice,mathclose,mathcode,mathinner,mathop,%
6915        mathopen,mathord,mathpunct,mathrel,mathsurround,maxdeadcycles,%
6916        maxdepth,meaning,medmuskip,message,mkern,month,moveleft,%
6917        moveright,mskip,multiply,muskip,muskipdef,newlinechar,noalign,%
6918        noboundary,noexpand,noindent,nolimits,nonscript,nonstopmode,%
6919        nulldelimiterspace,nullfont,number,omit,openin,openout,or,outer,%
6920        output,outputpenalty,over,overfullrule,overline,overwithdelims,%
6921        pagedepth,pagefilllstretch,pagefillstretch,pagefilstretch,%
6922        pagegoal,pageshrink,pagestretch,pagetotal,par,parfillskip,%
6923        parindent,parshape,parskip,patterns,pausing,penalty,%
6924        postdisplaypenalty,predisplaypenalty,predisplaysize,pretolerance,%
6925        prevdepth,prevgraf,radical,raise,read,relax,relpenalty,right,%
6926        righthyphenmin,rightskip,romannumeral,scriptfont,%
6927        scriptscriptfont,scriptscriptstyle,scriptspace,scriptstyle,%
6928        scrollmode,setbox,setlanguage,sfcode,shipout,show,showbox,%
6929        showboxbreadth,showboxdepth,showlists,showthe,skewchar,skip,%
6930        skipdef,spacefactor,spaceskip,span,special,splitbotmark,%
6931        splitfirstmark,splitmaxdepth,splittopskip,string,tabskip,%
```

```
6932        textfont,textstyle,the,thickmuskip,thinmuskip,time,toks,toksdef,%
6933        tolerance,topmark,topskip,tracingcommands,tracinglostchars,%
6934        tracingmacros,tracingonline,tracingoutput,tracingpages,%
6935        tracingparagraphs,tracingrestores,tracingstats,uccode,uchyph,%
6936        underline,unhbox,unhcopy,unkern,unpenalty,unskip,unvbox,unvcopy,%
6937        uppercase,vadjust,valign,vbadness,vbox,vcenter,vfil,vfill,%
6938        vfilneg,vfuzz,voffset,vrule,vsize,vskip,vsplit,vss,vtop,wd,%
6939        widowpenalty,write,xdef,xleaders,xspaceskip,year},%
6940      sensitive,%
6941      alsoother={0123456789$_},%$ to make Emacs fontlocking happy
6942      morecomment=[l]\%%
6943    }[keywords,tex,comments]%

6944 ⟨/lang3⟩
```

## 2.80   VBScript

Sonja WeidmannVBScript sent me this language definition.

```
6945 ⟨*lang2⟩

6946 %%
6947 %% VBScript definition (c) 2000 Sonja Weidmann
6948 %%
6949 \lst@definelanguage{VBScript}%
6950    {morekeywords={Call,Case,Const,Dim,Do,Each,Else,End,Erase,Error,Exit,%
6951        Explicit,For,Function,If,Loop,Next,On,Option,Private,Public,%
6952        Randomize,ReDim,Rem,Select,Set,Sub,Then,Wend,While,Abs,Array,Asc,%
6953        Atn,CBool,CByte,CCur,CDate,CDbl,Chr,CInt,CLng,Cos,CreateObject,%
6954        CSng,CStr,Date,DateAdd,DateDiff,DatePart,DateSerial,DateValue,%
6955        Day,Exp,Filter,Fix,FormatCurrency,FormatDateTime,FormatNumber,%
6956        FormatPercent,GetObject,Hex,Hour,InputBox,InStr,InStrRev,Int,%
6957        IsArray,IsDate,IsEmpty,IsNull,IsNumeric,IsObject,Join,LBound,%
6958        LCase,Left,Len,LoadPicture,Log,LTrim,Mid,Minute,Month,MonthName,%
6959        MsgBox,Now,Oct,Replace,RGB,Right,Rnd,Round,RTrim,ScriptEngine,%
6960        ScriptEngineBuildVersion,ScriptEngineMajorVersion,%
6961        ScriptEngineMinorVersion,Second,Sgn,Sin,Space,Split,Sqr,StrComp,%
6962        StrReverse,String,Tan,Time,TimeSerial,TimeValue,Trim,TypeName,%
6963        UBound,UCase,VarType,Weekday,WeekdayName,Year, And,Eqv,Imp,Is,%
6964        Mod,Not,Or,Xor,Add,BuildPath,Clear,Close,Copy,CopyFile,%
6965        CopyFolder,CreateFolder,CreateTextFile,Delete,DeleteFile,%
6966        DeleteFolder,Dictionary,Drive,DriveExists,Drives,Err,Exists,File,%
6967        FileExists,FileSystemObject,Files,Folder,FolderExists,Folders,%
6968        GetAbsolutePathName,GetBaseName,GetDrive,GetDriveName,%
6969        GetExtensionName,GetFile,GetFileName,GetFolder,%
6970        GetParentFolderName,GetSpecialFolder,GetTempName,Items,Keys,Move,%
6971        MoveFile,MoveFolder,OpenAsTextStream,OpenTextFile,Raise,Read,%
6972        ReadAll,ReadLine,Remove,RemoveAll,Skip,SkipLine,TextStream,Write,%
6973        WriteBlankLines,WriteLine,Alias,Archive,CDROM,Compressed,%
6974        Directory,Fixed,ForAppending,ForReading,ForWriting,Hidden,Normal,%
6975        RAMDisk,ReadOnly,Remote,Removable,System,SystemFolder,%
```

```
6976        TemporaryFolder,TristateFalse,TristateTrue,TristateUseDefault,%
6977        Unknown,Volume,WindowsFolder,vbAbortRetryIgnore,%
6978        vbApplicationModal,vbArray,vbBinaryCompare,vbBlack,vbBlue,%
6979        vbBoolean,vbByte,vbCr,vbCrLf,vbCritical,vbCurrency,vbCyan,%
6980        vbDataObject,vbDate,vbDecimal,vbDefaultButton1,vbDefaultButton2,%
6981        vbDefaultButton3,vbDefaultButton4,vbDouble,vbEmpty,vbError,%
6982        vbExclamation,vbFirstFourDays,vbFirstFullWeek,vbFirstJan1,%
6983        vbFormFeed,vbFriday,vbGeneralDate,vbGreen,vbInformation,%
6984        vbInteger,vbLf,vbLong,vbLongDate,vbLongTime,vbMagenta,vbMonday,%
6985        vbNewLine,vbNull,vbNullChar,vbNullString,vbOKC,ancel,vbOKOnly,%
6986        vbObject,vbObjectError,vbQuestion,vbRed,vbRetryCancel,vbSaturday,%
6987        vbShortDate,vbShortTime,vbSingle,vbString,vbSunday,vbSystemModal,%
6988        vbTab,vbTextCompare,vbThursday,vbTuesday,vbUseSystem,%
6989        vbUseSystemDayOfWeek,vbVariant,vbVerticalTab,vbWednesday,vbWhite,%
6990        vbYellow,vbYesNo,vbYesNoCancel},%
6991     sensitive=f,%
6992     morecomment=[l]',%
6993     morestring=[d]"%
6994   }[keywords,comments,strings]%
```

6995 ⟨/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.

6996 ⟨∗lang3⟩

```
6997 %%
6998 %% Verilog definition (c) 2003 Cameron H. G. Wright <c.h.g.wright@ieee.org>
6999 %%   Based on the IEEE 1364-2001 Verilog HDL standard
7000 %%   Ref: S. Palnitkar, "Verilog HDL: A Guide to Digital Design and Synthesis,"
7001 %%        Prentice Hall, 2003. ISBN: 0-13-044911-3
7002 %%
7003 \lst@definelanguage{Verilog}%
7004   {morekeywords={% reserved keywords
7005       always,and,assign,automatic,begin,buf,bufif0,bufif1,case,casex,%
7006       casez,cell,cmos,config,deassign,default,defparam,design,disable,%
7007       edge,else,end,endcase,endconfig,endfunction,endgenerate,%
7008       endmodule,endprimitive,endspecify,endtable,endtask,event,for,%
7009       force,forever,fork,function,generate,genvar,highz0,highz1,if,%
7010       ifnone,incdir,include,initial,inout,input,instance,integer,join,%
7011       large,liblist,library,localparam,macromodule,medium,module,nand,%
7012       negedge,nmos,nor,noshowcancelled,not,notif0,notif1,or,output,%
7013       parameter,pmos,posedge,primitive,pull0,pull1,pulldown,pullup,%
7014       pulsestyle_onevent,pulsestyle_ondetect,rcmos,real,realtime,reg,%
7015       release,repeat,rnmos,rpmos,rtran,rtranif0,rtranif1,scalared,%
7016       showcancelled,signed,small,specify,specparam,strong0,strong1,%
7017       supply0,supply1,table,task,time,tran,tranif0,tranif1,tri,tri0,%
```

```
7018      tri1,triand,trior,trireg,unsigned,use,vectored,wait,wand,weak0,%
7019      weak1,while,wire,wor,xnor,xor},%
7020   morekeywords=[2]{% system tasks and functions
7021      $bitstoreal,$countdrivers,$display,$fclose,$fdisplay,$fmonitor,%
7022      $fopen,$fstrobe,$fwrite,$finish,$getpattern,$history,$incsave,%
7023      $input,$itor,$key,$list,$log,$monitor,$monitoroff,$monitoron,%
7024      $nokey},%
7025   morekeywords=[3]{% compiler directives
7026      `accelerate,`autoexpand_vectornets,`celldefine,`default_nettype,%
7027      `define,`else,`elsif,`endcelldefine,`endif,`endprotect,%
7028      `endprotected,`expand_vectornets,`ifdef,`ifndef,`include,%
7029      `no_accelerate,`noexpand_vectornets,`noremove_gatenames,%
7030      `nounconnected_drive,`protect,`protected,`remove_gatenames,%
7031      `remove_netnames,`resetall,`timescale,`unconnected_drive},%
7032   alsoletter=\`,%
7033   sensitive,%
7034   morecomment=[s]{/*}{*/},%
7035   morecomment=[l]//,% nonstandard
7036   morestring=[b]"%
7037   }[keywords,comments,strings]%
```
7038 ⟨/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 Arnaud Tisseranddded three keywords.

7039 ⟨∗lang1⟩

```
7040 %%
7041 %% VHDL definition (c) 1997 Kai Wollenweber
7042 %%
7043 \lst@definelanguage{VHDL}%
7044   {morekeywords={ALL,ARCHITECTURE,ABS,AND,ASSERT,ARRAY,AFTER,ALIAS,%
7045      ACCESS,ATTRIBUTE,BEGIN,BODY,BUS,BLOCK,BUFFER,CONSTANT,CASE,%
7046      COMPONENT,CONFIGURATION,DOWNTO,ELSE,ELSIF,END,ENTITY,EXIT,%
7047      FUNCTION,FOR,FILE,GENERIC,GENERATE,GUARDED,GROUP,IF,IN,INOUT,IS,%
7048      INERTIAL,IMPURE,LIBRARY,LOOP,LABEL,LITERAL,LINKAGE,MAP,MOD,NOT,%
7049      NOR,NAND,NULL,NEXT,NEW,OUT,OF,OR,OTHERS,ON,OPEN,PROCESS,PORT,%
7050      PACKAGE,PURE,PROCEDURE,POSTPONED,RANGE,REM,ROL,ROR,REPORT,RECORD,%
7051      RETURN,REGISTER,REJECT,SIGNAL,SUBTYPE,SLL,SRL,SLA,SRA,SEVERITY,%
7052      SELECT,THEN,TYPE,TRANSPORT,TO,USE,UNITS,UNTIL,VARIABLE,WHEN,WAIT,%
7053      WHILE,XOR,XNOR,%
7054      DISCONNECT,ELIF,WITH},% Arnaud Tisserand
7055   sensitive=f,% 1998 Gaurav Aggarwal
7056   morecomment=[l]--,%
7057   morestring=[d]{"}%
7058   }[keywords,comments,strings]%
```
The VHDL-AMS dialect has been added by Steffen Klupsch.

```
7059 %%
7060 %% VHDL-AMS definition (c) Steffen Klupsch
7061 %%
7062 \lst@definelanguage[AMS]{VHDL}[]{VHDL}%
7063   {morekeywords={ACROSS,ARRAY,BREAK,DISCONNECT,NATURE,NOISE,PORT,%
7064       PROCEDURAL,QUANTITY,SHARED,SPECTRUM,SUBNATURE,TERMINAL,THROUGH,%
7065       TOLERANCE,UNAFFACTED,UNITS}}
```

7066 ⟨/lang1⟩

## 2.83   VRML

This language is due to Oliver Baum VRML.

7067 ⟨∗lang2⟩

```
7068 %%
7069 %% VRML definition (c) 2001 Oliver Baum
7070 %%
7071 \lst@definelanguage[97]{VRML}
7072   {morekeywords={DEF,EXTERNPROTO,FALSE,IS,NULL,PROTO,ROUTE,TO,TRUE,USE,%
7073       eventIn,eventOut,exposedField,field,Introduction,Anchor,%
7074       Appearance,AudioClip,Background,Billboard,Box,Collision,Color,%
7075       ColorInterpolator,Cone,Coordinate,CoordinateInterpolator,%
7076       Cylinder,CylinderSensor,DirectionalLight,ElevationGrid,Extrusion,%
7077       Fog,FontStyle,Group,ImageTexture,IndexedFaceSet,IndexedLineSet,%
7078       Inline,LOD,Material,MovieTexture,NavigationInfo,Normal,%
7079       NormalInterpolator,OrientationInterpolator,PixelTexture,%
7080       PlaneSensor,PointLight,PointSet,PositionInterpolator,%
7081       ProximitySensor,ScalarInterpolator,Script,Shape,Sound,Sphere,%
7082       SphereSensor,SpotLight,Switch,Text,TextureCoordinate,%
7083       TextureTransform,TimeSensor,TouchSensor,Transform,Viewpoint,%
7084       VisibilitySensor,WorldInfo},%
7085    morecomment=[l]\#,% bug: starts comment in the first column
7086    morestring=[b]"%
7087   }[keywords,comments,strings]
```

7088 ⟨/lang2⟩

## 2.84   XML et al

Bernhard Walle provided the following two definitions.

7089 ⟨∗lang1⟩

```
7090 \lst@definelanguage{XSLT}[]{XML}%
7091   {morekeywords={%
7092       % main elements
7093       xsl:stylesheet,xsl:transform,%
7094       % childs of the main element
7095       xsl:apply-imports,xsl:attribute-set,xsl:decimal-format,xsl:import,%
7096       xsl:include,xsl:key,xsl:namespace-alias,xsl:output,xsl:param,%
7097       xsl:preserve-space,xsl:strip-space,xsl:template,xsl:variable,%
```

```
7098        % 21 directives
7099        xsl:apply-imports,xsl:apply-templates,xsl:attribute,%
7100        xsl:call-template,xsl:choose,xsl:comment,xsl:copy,xsl:copy-of,%
7101        xsl:element,xsl:fallback,xsl:for-each,xsl:if,xsl:message,%
7102        xsl:number,xsl:otherwise,xsl:processing-instruction,xsl:text,%
7103        xsl:value-of,xsl:variable,xsl:when,xsl:with-param},%
7104     alsodigit={-},%
7105     }%

7106 \lst@definelanguage{Ant}[]{XML}%
7107     {morekeywords={%
7108        project,target,patternset,include,exclude,excludesfile,includesfile,filterset,%
7109        filter,filtersfile,libfileset,custom,classpath,fileset,none,depend,mapper,%
7110        filename,not,date,contains,selector,depth,or,and,present,majority,size,dirset,%
7111        filelist,pathelement,path,param,filterreader,extension,filterchain,linecontainsregexp,%
7112        regexp,classconstants,headfilter,tabstospaces,striplinebreaks,tailfilter,stripjavacomments
7113        expandproperties,linecontains,replacetokens,token,striplinecomments,comment,prefixlines,%
7114        classfileset,rootfileset,root,description,xmlcatalog,entity,dtd,substitution,%
7115        extensionSet,propertyfile,entry,vsscheckin,sql,transaction,cvspass,csc,%
7116        dirname,wlrun,wlclasspath,p4label,replaceregexp,get,jjtree,sleep,jarlib,%
7117        dependset,targetfileset,srcfileset,srcfilelist,targetfilelist,zip,zipgroupfileset,zipfiles
7118        patch,jspc,webapp,style,test,arg,jvmarg,sysproperty,testlet,env,tstamp,%
7119        format,unwar,vsshistory,icontract,cvschangelog,user,p4submit,ccmcheckin,%
7120        p4change,bzip2,vssadd,javadoc,bottom,source,doctitle,header,excludepackage,bootclasspath,%
7121        doclet,taglet,packageset,sourcepath,link,footer,package,group,title,tag,%
7122        translate,signjar,vajload,vajproject,jarlib,extensionset,WsdlToDotnet,buildnumber,%
7123        jpcovmerge,tomcat,ejbjar,weblogictoplink,jboss,borland,weblogic,iplanet,jonas,%
7124        support,websphere,wasclasspath,war,manifest,attribute,section,metainf,lib,%
7125        classes,webinf,rename,sequential,serverdeploy,generic,property,move,%
7126        copydir,cccheckin,wljspc,fixcrlf,sosget,pathconvert,map,record,p4sync,exec,%
7127        p4edit,maudit,rulespath,searchpath,antlr,netrexxc,jpcovreport,reference,filters,%
7128        coveragepath,execon,targetfile,srcfile,ccmcheckout,ant,xmlvalidate,xslt,%
7129        iplanet,ccmcheckintask,gzip,native2ascii,starteam,ear,archives,input,%
7130        rmic,extdirs,compilerarg,checksum,mail,bcc,message,cc,to,from,loadfile,vsscheckout,%
7131        stylebook,soscheckin,mimemail,stlabel,gunzip,concat,cab,touch,parallel,splash,%
7132        antcall,cccheckout,typedef,p4have,xmlproperty,copy,tomcat,antstructure,ccmcreatetask,%
7133        rpm,delete,replace,replacefilter,replacetoken,replacevalue,mmetrics,waitfor,isfalse,%
7134        equals,available,filepath,os,filesmatch,istrue,isset,socket,http,uptodate,srcfiles,%
7135        untar,loadproperties,echoproperties,vajexport,stcheckout,bunzip2,copyfile,vsscreate,%
7136        ejbc,unjar,tomcat,wsdltodotnet,mkdir,condition,cvs,commandline,marker,argument,%
7137        tempfile,junitreport,report,taskdef,echo,ccupdate,java,renameext,vsslabel,basename,%
7138        javadoc2,vsscp,tar,tarfileset,tomcat,vajimport,setproxy,wlstop,p4counter,ilasm,%
7139        soscheckout,apply,ccuncheckout,jarlib,location,url,cvstagdiff,jlink,mergefiles,%
7140        addfiles,javacc,pvcs,pvcsproject,jarlib,options,depends,chmod,jar,sound,fail,%
7141        success,mparse,blgenclient,genkey,dname,javah,class,ccmreconfigure,unzip,javac,%
7142        src,p4add,soslabel,jpcoverage,triggers,method,vssget,deltree,ddcreator},
7143     deletekeywords={default},%
7144     }

7145 ⟨/lang1⟩
```

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

7146 ⟨∗lang1⟩

```
7147 \lst@definelanguage{XML}%
7148   {keywords={,CDATA,DOCTYPE,ATTLIST,termdef,ELEMENT,EMPTY,ANY,ID,%
7149       IDREF,IDREFS,ENTITY,ENTITIES,NMTOKEN,NMTOKENS,NOTATION,%
7150       INCLUDE,IGNORE,SYSTEM,PUBLIC,NDATA,PUBLIC,%
7151       PCDATA,REQUIRED,IMPLIED,FIXED,%%% preceded by #
7152       xml,xml:space,xml:lang,version,standalone,default,preserve},%
7153   alsoother=$,%
7154   alsoletter=:,%
7155   tag=**[s]<>,%
7156   morestring=[d]",% ??? doubled
7157   morestring=[d]',% ??? doubled
7158   MoreSelectCharTable=%
7159       \lst@CArgX--\relax\lst@DefDelimB{}{}%
7160           {\ifnum\lst@mode=\lst@tagmode\else
7161               \expandafter\@gobblethree
7162           \fi}%
7163           \lst@BeginComment\lst@commentmode{{\lst@commentstyle}}%
7164       \lst@CArgX--\relax\lst@DefDelimE{}{}{}%
7165           \lst@EndComment\lst@commentmode
7166       \lst@CArgX[CDATA[\relax\lst@CDef{}%
7167           {\ifnum\lst@mode=\lst@tagmode
7168               \expandafter\lst@BeginCDATA
7169           \else \expandafter\lst@CArgEmpty
7170           \fi}%
7171           \@empty
7172       \lst@CArgX]]\relax\lst@CDef{}%
7173           {\ifnum\lst@mode=\lst@GPmode
7174               \expandafter\lst@EndComment
7175           \else \expandafter\lst@CArgEmpty
7176           \fi}%
7177           \@empty
7178   }[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.

7179 ⟨/lang1⟩