

## Gramática LM - LL1 EBNF

MODULE = (1) FUNCTIONS MAIN

FUNCTIONS = (2) 'ID' PARAMS RETURNTYPE ESCAPE FUNCTIONS |  
(3)  $\epsilon$

MAIN = (4) 'MAIN' 'OP' 'CP' 'VOID' ESCAPE

PARAMS = (5) 'OP' PARAMSEXT

PARAMSEXT = (6) 'CP' |  
(7) LISTPARAMS 'CP'

LISTPARAMS = (8) TYPE NAME LISTPARAMSEXT

LISTPARAMSEXT = (9) 'SPTR' LISTPARAMS | (10)  $\epsilon$

TYPE = (11) 'INT' | (12) 'BOOL' | (13) 'CHAR' | (14) 'STRING' | (15) 'FLOAT'

RETURNTYPE = (16) 'VOID' | (17) TYPE RETURNTYPEEXT

RETURNTYPEEXT = (18) 'OB' 'CB' | (19)  $\epsilon$

NAME = (20) 'ID' NAMEEXT

NAMEEXT = (21) 'OB' EA 'CB' | (22)  $\epsilon$

ESCAPE = (25) 'OK' COMMANDS 'CK' 'SCO'

COMMANDS = (26) CMD 'SCO' COMMANDS | (27)  $\epsilon$

CMD = (28) DECLARATION | (29) 'ID' CMDEXT | (30) PRINT | (31) READ | (32) IFELSE |  
(33) WHEN | (34) REPEATER | (35) RETURN

DECLARATION = (36) TYPE NAME

CMDEXT = (37) ATTRIBUTION | (38) FUNCTIONCALL

ATTRIBUTION = (39) NAMEEXT 'ATR' VALUE

VALUE = (40) ARRAY | (41) EA

ARRAY = (42) 'OB' ARRAYEXT

ARRAYEXT = (43) ELEMENTS 'CB' | (44) 'CB'

ELEMENTS = (45) CONSTANT ELEMENTSEXT

ELEMENTSEXT = (46) 'SPTR' ELEMENTS | (47)  $\epsilon$

FUNCTIONCALL = (48) 'OP' LISTPARAMSCALL 'CP'

LISTPARAMSCALL = (49) PARAMITEM LISTPARAMSCALLEXT |  $\epsilon$

LISTPARAMSCALLEXT = (50) 'SPTR' LISTPARAMSCALL | (51)  $\epsilon$

PARAMITEM = (52) CONSTANT | (53) NAME

PRINT = (54) 'PRINT' 'OP' MESSAGE PRINTEXT 'CP'

PRINTEXT = 'SPTR' NAME PRINTEXT |  $\epsilon$

MESSAGE = (55) 'CTESTRING' MESSAGEEXT | (56) NAME MESSAGEEXT

MESSAGEEXT = (57) 'CONCAT' MESSAGE | (58)  $\epsilon$

READ = (59) 'READ' 'OP' READEXT 'CP'

READEXT = (60) NAME READEXTR

READEXTR = (61) 'SPTR' READEXT | (62)  $\epsilon$

IFELSE = (63) IF ELIF ELSE

IF = (64) 'IF' 'OP' EB 'CP' 'OK' COMMANDS 'CK'

ELIF = (65) 'ELIF' 'OP' EB 'CP' 'OK' COMMANDS 'CK' ELIF | (66)  $\epsilon$

ELSE = (67) 'ELSE' 'OK' COMMANDS 'CK' | (68)  $\epsilon$

WHEN = (69) 'WHEN' 'OP' EB 'CP' 'OK' COMMANDS 'CK'

REPEATER = (70) 'REPEATER' 'OP' 'ID' ATTRIBUTION 'SCO' PARAMITEM 'SCO'  
PARAMITEM 'CP' 'OK' COMMANDS 'CK'

RETURN = (71) 'RETURN' RETURNEXT

RETURNEXT = (72) CONSTANT | (73) NAME

## **Gramática sem restrições:**

EB = EB 'OR' TB | TB

TB = TB 'AND' FB | FB

FB = 'NOT' FB | EA EREL

EREL = 'ORC' EA | 'ORE' EA

EA = EA 'OPA' TA | TA

TA = TA 'OPM' PA | PA

PA = FA 'OPE' PA | FA

FA = 'OPU' FA | 'OP' EB 'CP' | CONSTANT | ID

ID = 'ID' | 'ID' 'OB' EA 'CB' | 'ID' 'OP' LISTPARAMSCALL 'CP'

## Gramática com restrições:

$EB = TB \ EBR$

$EBR = 'OR' \ TB \ EBR \mid \varepsilon$

$TB = FB \ TBR$

$TBR = 'AND' \ FB \ TBR \mid \varepsilon$

$FB = 'NOT' \ FB \mid EA \ EREL$

$EREL = 'ORC' \ EA \mid 'ORE' \ EA$

$EA = TA \ EAR$

$EAR = 'OPA' \ TA \ EAR \mid \varepsilon$

$TA = PA \ TAR$

$TAR = 'OPM' \ PA \ TAR \mid \varepsilon$

$PA = FA \ PAFAT$

$PAFAT = 'OPE' \ PA \mid \varepsilon$

$FA = 'OPU' \ FA \mid 'OP' \ EB \ 'CP' \mid \text{CONSTANT} \mid \text{ID}$

$ID = 'ID' \ IDFAT$

$IDFAT = 'OB' \ EA \ 'CB' \mid 'OP' \ \text{LISTPARAMSCALL} \ 'CP' \mid \varepsilon$

$\text{CONSTANT} = (74) \ 'CTEINT' \mid (75) \ 'CTEFLOAT' \mid (76) \ 'CTEBOOL' \mid (77) \ 'CTECHAR' \mid (78) \ 'CTESTRING'$