

## Gramática da Linguagem GF

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PROGRAM = FUNCTIONS MAINFUNC

PROGRAM = DECL 'endLine' GLDECL FUNCTIONS MAINFUNC

GLDECL = DECL 'endLine' GLDECL

GLDECL =  $\epsilon$

FUNCTIONS = 'funDecl' 'id' PARAMS RETURNTYPE BLOCK FUNCTIONS

FUNCTIONS =  $\epsilon$

MAINFUNC = 'main' 'paramBeg' 'paramEnd' TYPE BLOCK

PARAMS = 'paramBeg' LISTPARAMS 'paramEnd'

LISTPARAMS = TYPE NAME

LISTPARAMS = LISTPARAMS 'commaSep' TYPE NAME

LISTPARAMS =  $\epsilon$

TYPE = 'typeInt'

TYPE = 'typeFloat'

TYPE = 'typeBool'

TYPE = 'typeChar'

TYPE = 'typeString'

TYPE = 'typeEmpty'

TYPE = 'typeNull'

RETURNTYPE = TYPE

RETURNTYPE = TYPE 'arrayBeg' 'arrayEnd'

NAME = 'id'

NAME = 'id' 'arrayBeg' EXPR 'arrayEnd'

NAME = 'id' 'arrayBeg' 'arrayEnd'

BLOCK = 'blockBeg' CMDS 'blockEnd'

CMDS = CMDS CMD

CMDS = CMD

CMD = DECL 'endLine'  
CMD = 'id' ASSG 'endLine'  
CMD = 'id' 'arrayBeg' EXPR 'arrayEnd' ASSG 'endLine'  
CMD = 'id' FUNCCALL 'endLine'  
CMD = PRINT 'endLine'  
CMD = READ 'endLine'  
CMD = IFELSE  
CMD = WHILE  
CMD = REPEAT  
CMD = RETURN 'endLine'

DECL = 'varDecl' TYPE NAME  
DECL = 'varDecl' TYPE NAME ASSG

ASSG = 'opAssign' VALUE

VALUE = ARRAY  
VALUE = EXPR

ARRAY = 'arrayValBeg' ELEMENTS 'arrayValEnd'

ELEMENTS = EXPR  
ELEMENTS = ELEMENTS 'commaSep' EXPR

CONSTANT = 'constNumInt'  
CONSTANT = 'constNumFloat'  
CONSTANT = 'constBool'  
CONSTANT = 'constChar'  
CONSTANT = 'constString'

FUNCCALL = 'paramBeg' LISTPARAMSCALL 'paramEnd'

LISTPARAMSCALL = PARAMITEM  
LISTPARAMSCALL = LISTPARAMSCALL 'commaSep' PARAMITEM

PARAMITEM = CONSTANT  
PARAMITEM = NAME  
PARAMITEM = NAME FUNCCALL  
PARAMITEM =  $\epsilon$

PRINT = 'cmdPrint' 'paramBeg' EXPR 'paramEnd'

READ = 'cmdRead' 'paramBeg' NAME 'paramEnd'

IFELSE = IF ELIF ELSE

IF = 'cmdIf' 'paramBeg' EXPR 'paramEnd' BLOCK

ELIF = 'cmdElif' 'paramBeg' EXPR 'paramEnd' BLOCK ELIF

ELIF =  $\epsilon$

ELSE = 'cmdElse' BLOCK

ELSE =  $\epsilon$

WHILE = 'cmdWhile' 'paramBeg' EXPR 'paramEnd' BLOCK

REPEAT = 'cmdRepeat' 'id' 'cmdIn' 'paramBeg' EXPR 'commaSep'  
EXPR 'commaSep' EXPR 'paramEnd' BLOCK

REPEAT = 'cmdRepeat' 'id' 'cmdIn' 'paramBeg' EXPR 'commaSep'  
EXPR 'paramEnd' BLOCK

RETURN = 'cmdReturn' EXPR

EXPR = EXPROR

EXPROR = EXPROR 'opOr' EXPRAND

EXPROR = EXPRAND

EXPRAND = EXPRAND 'opAnd' EXPREQUALS

EXPRAND = EXPREQUALS

EXPREQUALS = EXPRREL 'opEquals' EXPRREL

EXPREQUALS = EXPRREL

EXPRREL = EXPRADD 'opRel' EXPRADD

EXPRREL = EXPRADD

EXPRADD = EXPRADD 'opAditiv' EXPRAMULT

EXPRADD = EXPRAMULT

EXPRAMULT = EXPRAMULT 'opMult' EXPRUN

EXPRAMULT = EXPRUN

EXPRUN = 'opUnaryNeg' EXPRUN

**EXPRUN = EXPRPARAM**

**EXPRPARAM = 'paramBeg' EXPR 'paramEnd'**

**EXPRPARAM = EXPRVALUES**

**EXPRVALUES = 'id'**

**EXPRVALUES = 'constNumInt'**

**EXPRVALUES = 'constNumFloat'**

**EXPRVALUES = 'constBool'**

**EXPRVALUES = 'constChar'**

**EXPRVALUES = 'constString'**

**EXPRVALUES = 'constString' CONCAT**

**EXPRVALUES = 'id' 'arrayBeg' EXPR 'arrayEnd' ARRCONCAT**

**EXPRVALUES = 'id' FUNCCALL**

**EXPRVALUES = 'id' CONCAT**

**ARRCONCAT = CONCAT**

**ARRCONCAT =  $\epsilon$**

**CONCAT = 'opConcat' 'constString'**

**CONCAT = 'opConcat' 'id'**