

Universidade Federal de Alagoas
Instituto de Computação
Compiladores

Onicla - Gramática Livre de Contexto e Gramática LL(1)

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1. Gramática Livre de Contexto

S = DeclFunction S | DeclId S | ε

DeclFunction = 'Function' FunctionType NameFunctionId '(' ConstDecl ')' InternalDecl

NameFunction = 'id' | 'PR_MAIN'

Parameter = VarType 'id' Parameter | ',' VarType 'id' Parameter | Es Parameter | ',' Es Parameter | ε

AbFecPar = '(' Parameter ')'

FunctionType = 'Integer' | 'Float' | 'Characterarray' | 'Bool' | 'Void' | 'Character' | 'Main'

VarType = 'Integer' | 'Float' | 'Character' | 'CharacterArray' | 'Bool'

InternalDecl = 'Begin' Instructions 'End'

DeclId = VarType 'id' ';' | 'id' | ε

ParamFunction = ParamFunction ',' Ec | Ec | ε

ConstDecl = ConstDecl ',' VarType Id | VarType Id | ε

Id = 'id' '[' Ea ']' | 'id'

IdLL = LId ',' Id '=' Ec | LId ',' Id | Id '=' Ec | Id

VectorType = '[' Es ']' | ε

Atrib = Atrib ',' 'id' '=' Ec ';' | Atrib ',' 'id' '[' Ea ']' '=' Ec ';' | 'id' '=' Ec | 'id' '[' Ea ']' '=' Ec | ε

Instructions = Command Instruction | DeclId Instructions | Id '(' ParamFunction ')' ';' Instructions | 'Refound' Return ';' | ε

Command = 'If' '(' Eb ')' InternalDecl | 'If' '(' Eb ')' InternalDecl 'Else' InternalDecl

Command = 'While' '(' Eb ')' | 'Repeat' '(' 'PR_INT' '=' 'id' ',' 'id' ',' 'id' ')' | 'Input' '(' Id
')' | 'Print' '(' Id ')'

Command = FunctionCall

FunctionCall = 'id' AbFecPar ';' | 'id' '(' ParamFunction ')' ';'

IdFunctionCall = Id | 'id' '(' ParamFunction ')' | 'id'

If = 'If' '(' Eb ')' InternalDecl | 'if' '(' Eb ')' InternalDecl 'Else'

Else = 'Else' 'Begin' Instruction 'End' | ε

PrintParam = ',' Eb PrintParam | ε

InputParam = Id | InputParam

While = 'While' '(' Eb ')' 'Begin' Instruction 'End'

Repeat = 'Repeat' '(' Integer 'id' '=' Ea ',' Ea ')' 'Begin' Instruction 'End'

Refound = 'Refound' Ec ';'

Input = 'Input' '(' 'id' ')' ';'

Print = 'Print' '(' Es ')' ';'

Ec = Ec 'OP_CONCAT' Eb Eb

Eb = Eb 'PR_OR' Tb | Tb

Tb = Tb 'PR_AND' Fb | Fb

Fb = Fb 'OP_REL' Ra | 'OP_NOT' Fb | Ra

Ra = Ra 'OP_REL' Ea | Ea

Ea = Ea 'OP_AD' Ta | Ea 'OP_SUB' Ta | Ta

Ta = Ta 'OP_MULT' Fa | Ta 'OP_DIV' Fa | Fa

Fa = '(' Ec ')' | 'OP_SUB' Fa | IdOrFunCall | 'CTE_INT' | 'CTE_FLOAT' | 'CTE_BOOL'
| 'CTE_CADCHA' | 'CTE_CHAR'

OP_REL = '==' | '!=' | 'OP_GREATER' | 'OP_LESS' | 'OP_GREATEQ' | 'OP_LESSEQ'

2. Gramática LL(1)

S = DeclFunction S | DeclId S | ϵ

DeclFunction = 'Function' FunctionType NameFunctionId '(' ConstDecl ')' InternalDecl

NameFunction = 'id' | 'PR_MAIN'

Parameter = VarType 'id' Parameter | ',' VarType 'id' Parameter | Es Parameter | ',' Es Parameter | ϵ

AbrFecPar = '(' Parameter ')'

Parameter = VarType 'id' Parameter | ',' VarType 'id' Parameter | Es Parameter | ',' Es Parameter | ϵ

FunctionType = 'Integer' | 'Float' | 'Characterarray' | 'Bool' | 'Void' | 'Character' | 'Main'

VarType = 'Integer' | 'Float' | 'Character' | 'CharacterArray' | 'Bool'

InternalDecl = 'FunctionInternDec' 'Begin' LDecl 'End'

DeclId = VarType 'id' ';' | 'id' | ϵ

ParamFunction = Ec ParamFunctionLL | ϵ

ParamFunctionLL = ',' Ec ParamFunctionLL | ϵ

ConstDecl = VarType 'id' VectorType ConstDecl_LL | ϵ

ConstDecl_LL = ',' VarType 'id' VectorType ConstDecl_LL | ϵ

Id = 'id' VectorType

IdLL = Id Atrib Id_LL

Id_LL = ',' Id Atrib IdLL | ϵ

VectorType = '[' Ea ']' | ϵ

Atrib = ',' Id '=' Ec ';' Atrib | ϵ

Instructions = Command Instruction | DeclId Instructions | Id '(' ParamFunction ')' ';' Instructions | 'Refound' Return ';' | ϵ

Command = 'If' '(' Eb ')' InternalDecl | 'If' '(' Eb ')' InternalDecl 'Else' InternalDecl

Command = 'While' '(' Eb ')' | 'Repeat' '(' 'PR_INT' '=' 'id' ',' 'id' ',' 'id' ')' | 'Input' '(' Id ')' | 'Print' '(' Id ')'

Command = FunctionCall

FunctionCall = 'id' AbFecPar ';'

If = 'If' '(' Eb ')' InternalDecl | 'If' '(' Eb ')' InternalDecl 'Else' InternalDecl

Else = 'Else' InternalDecl | ϵ

While = 'While' '(' Eb ')' 'Begin' Instruction 'End'

Repeat = 'Repeat' '(' Integer 'id' '=' Ea ',' Ea ')' 'Begin' Instruction 'End'

Refound = 'Refound' Es ';'

InputParam = 'id' VectorType InputParamLL

InputParamLL = ',' 'id' VectorType InputParamLL | ϵ

PrintParam = ',' Ec PrintParam | ϵ

Ec = Eb EcLL

EcLL = 'OP_CONCAT' Eb EcLL | ϵ

Eb = Tb EbLL

EbLL = 'PR_OR' Tb EbLL | ϵ

Tb = Fb TbLL

TbLL = 'PR_AND' Fb TbLL | ϵ

Fb = 'OP_NOT' Fb | Ra FbLL

FbLL = 'OP_GREATER' Ra FbLL | FbLL = 'OP_LESS' Ra FbLL | 'OP_GREATEREQ'
Ra FbLL | 'OP_LESSEQ' Ra FbLL | ϵ

Ra = Ea RaLL

RaLL = 'OP_REL' Ea RaLL | ϵ

Ea = Ta EaLL

EaLL = 'OP_AD' Ta EaLL | 'OP_SUB' Ta EaLL | ϵ

Ta = Pa TaLL

TaLL = 'OP_MULT' Pa TaLL | 'OP_DIV' Pa TaLL | ϵ

Pa = Fa PaLL

PaLL = 'OP_RES' Fa PaLL | ϵ

Fa = '(' Ec ')' | 'OP_SUB' Fa | IdOrFunCall | 'CTE_INT' | 'CTE_FLOAT' | 'CTE_BOOL'
| 'CTE_CADCHA' | 'CTE_CHAR'

IdFunctionCall = 'id' IdFunctionCall_LL

IdFunctionCall_LL = '(' ParamFunction ')' | '[' Ea ']