Analisador Descendente Preditivo Tabular

Gramática LL(1)

PROGRAM = **(1)** ‘prDuma’ ‘id’ BEGIN
First (‘prDuma’ CONSTANT BLOCK) = {‘prDuma’} = d1

BEGIN = **(2)** FUNCTIONS INITIUM
First(FUNCTIONS INITIUM) = First(RETURNTYPE) U Follow(FUNCTIONS) = First(TYPE) U {‘prInitials’}= {‘tdInanis’, ‘tdInt’, ‘tdReal’, ‘tdLit’, ‘tdBool’, ‘tdSermo’, ‘prInitials’} = d2

FUNCTIONS = **(3)** RETURNTYPE ‘id’ PARAMS SCOPE FUNCTIONS | **(4)** ε
First(RETURNTYPE ‘id’ PARAMS SCOPE FUNCTIONS) = First(RETURNTYPE) = First(TYPE) = {‘tdInanis’, ‘tdInt’, ‘tdReal’, ‘tdLit’, ‘tdBool’, ‘tdSermo’} = d3
Follow(FUNCTIONS) = {‘prInitials’} = d4 ou ε

INITIUM = **(5)** ‘prInitials’ ‘tdInanis’ ‘prInitium’ ‘paramBegin’ ‘paramEnd’ SCOPE
First (‘prInitials’ ‘tdInanis’ ‘prInitium’ ‘paramBegin’ ‘paramEnd’ SCOPE) = {‘prInitials’} = d5

PARAMS = **(6)** ‘paramBegin’ PARAMSFAT
First(‘paramBegin’ PARAMSFAT) = {‘paramBegin’} = d6

PARAMSFAT = **(7)** ‘paramEnd’ | **(8)** LISTPARAMS ‘paramEnd’
First(‘paramEnd’) = {‘paramEnd’} = d7
First(LISTPARAMS ‘paramEnd’) = First(LISTPARAMS) = First(TYPE) U First(‘prMatrix’) = {‘tdInanis’, ‘tdInt’, ‘tdReal’, ‘tdLit’, ‘tdBool’, ‘tdSermo’, ‘prMatrix’} = d8

LISTPARAMS = **(9)** TYPE NAME LISTPARAMSFAT | **(10)** ‘prMatrix’ TYPE NAME LISTPARAMSFAT
First(TYPE NAME LISTPARAMSFAT) = First(TYPE) = {‘tdInanis’, ‘tdInt’, ‘tdReal’, ‘tdLit’, ‘tdBool’, ‘tdSermo’} = d9
First(‘prMatrix’ TYPE NAME LISTPARAMSFAT) = {‘prMatrix’} = d10

LISTPARAMSFAT = **(11)** ‘sepVirg’ LISTPARAMS | **(12)** ε
First(‘sepVirg’ LISTPARAMS) = {‘sepVirg’} = d11
Follow(LISTPARAMSFAT) = {‘paramEnd’} = d12

RETURNTYPE = **(13)** TYPE | **(14)** ‘prMatrix’ TYPE
First(TYPE) = {‘tdInanis’, ‘tdInt’, ‘tdReal’, ‘tdLit’, ‘tdBool’, ‘tdSermo’} = d13
First(‘prMatrix’ TYPE) = {‘prMatrix’} = d14

TYPE = **(15)** ‘tdInanis’ | **(16)** ‘tdInt’ | **(17)** ‘tdReal’ | **(18)** ‘tdLit’ | **(19)** ‘tdBool’ | **(20)** ‘tdSermo’
First(‘tdInanis’) = {‘tdInanis’} = d15
First(‘tdInt’) = {‘tdInt’} = d16
First(‘tdReal’) = {‘tdReal’} = d17
First(‘tdLit’) = {‘tdLit’} = d18
First(‘tdBool’) = {‘tdBool’} = d19
First(‘tdSermo’) = {‘tdSermo’} = d20

CONSTANT = **(21)** ‘cteNumInt’ | **(22)** ‘cteNumReal’ | **(23)** ‘cteLit’ | **(24)** ‘cteSermo’ | **(25)** ‘cteBool’
First(‘cteNumInt’) = {‘cteNumInt’} = d21
First(‘cteNumReal’) = {‘cteNumReal’} = d22
First(‘cteLit’) = {‘cteLit’} = d23
First(‘cteSermo’) = {‘cteSermo’} = d24
First(‘cteBool’) = {‘cteBool’} = d25

NAME = (**26**) ‘id’ NAMEFAT
First(‘id’ NAMEFAT) = {‘id’} = d26

NAMEFAT = **(27)** ‘vetBegin’ Eb ‘vetEnd’ | **(28)** ε
First(‘vetBegin’ A ‘vetEnd’) = {‘vetBegin’} = d27
Follow(NAMEFAT) = {‘termCmd’, ‘opCon’, ‘paramEnd’, ‘sepVirg’, ‘instAtrib’} = d28

SCOPE = **(29)** ‘escBegin’ COMMANDS ‘escEnd’ ‘termCmd’
First(‘escBegin’ COMMANDS ‘escEnd’) = {‘escBegin’} = d29

COMMANDS = **(30)** CMD ‘termCmd’ COMMANDS | **(31)** ε
First(CMD ‘termCmd’ COMMANDS) = First(CMD) = First(DECLARATION) U First(‘id’ CMDFAT) U First(WRITE) U First(READ) U First(IFELSE) U First(WHILE) U First(DOWHILE) U First(FOR) U First(RETURN) = {‘tdInanis’, ‘tdInt’, ‘tdReal’, ‘tdLit’, ‘tdBool’, ‘tdSermo’, ‘prMatrix’} U {‘id} U {‘prScribo’} U {‘prLectio’} U {‘selSi’} U {‘repDum’} U {‘repFacite’} U {‘repQuia’} U {‘prReditus’} = d30
Follow(COMMANDS) = {‘escEnd’} = d31 ou ε

CMD = **(32)** DECLARATION | **(33)** ‘id’ CMDFAT | **(34)** WRITE | **(35)** READ | **(36)** IFELSE
| **(37)** WHILE | **(38)** DOWHILE | **(39)** FOR | **(40)** RETURN
First(DECLARATION) = {‘tdInanis’, ‘tdInt’, ‘tdReal’, ‘tdLit’, ‘tdBool’, ‘tdSermo’, ‘prMatrix’} = d32
First(‘id’ CMDFAT) = {‘id} = d33
First(WRITE) = {‘prScribo’} = d34
First(READ) = {‘prLectio’} = d35
First(IFELSE) = {‘selSi’} = d36
First(WHILE) = {‘repDum’} = d37
First(DOWHILE) = {‘repFacite’} = d38
First(FOR) = {‘repQuia’} = d39

First(RETURN) = {‘prReditus’} = d40

DECLARATION = **(41)** TYPE NAME | **(42)** ‘prMatrix’ TYPE NAME
First(TYPE NAME) = First(TYPE) = {‘tdInanis’, ‘tdInt’, ‘tdReal’, ‘tdLit’, ‘tdBool’, ‘tdSermo’} = d41
First(‘prMatrix’ TYPE NAME) = First(‘prMatrix’) = {‘prMatrix’} = d42

CMDFAT = **(43)** ATTRIBUTION | **(44)** FUNCCALL
First(ATTRIBUTION) = First(NAMEFAT) U Follow(NAMEFAT) = {‘vetBegin’} U {‘sepVirg’, ‘instAtrib’, ‘termCmd’, ’opCon’, ‘paramEnd’} = d43
First(FUNCCALL) = {‘paramBegin’} = d44

ATTRIBUTION = **(45)** NAMEFAT ‘instAtrib’ VALUE
First(NAMEFAT ‘instAtrib’ VALUE) = First(NAMEFAT) U Follow(NAMEFAT) = {‘vetBegin’} U {‘sepVirg’, ‘termCmd’, ‘opCon’, ‘paramEnd’, ‘instAtrib’} = d45

VALUE = **(46)** ARRAY | **(47)** Eb
First(ARRAY) = {‘vetBegin’} = d46
First(Eb) = First(Tb) = First(Fb) = First(Erel2) = First(Erel1) = First(Ea) = First(Ta) U First(Fa) = {‘opLogNeg’,’opAritUn’, ‘paramBegin’, ‘cteNumInt’, ‘cteNumReal’, ‘cteBool’, ‘cteLit’, ‘cteSermo’, ’id’} = d47

ARRAY = **(48)** ‘vetBegin’ ARRAYFAT
First(‘vetBegin’ ARRAYFAT) = {‘vetBegin’} = d48

ARRAYFAT = **(49)** ELEMENTS ‘vetEnd’ | **(50)** ‘vetEnd’
First(ELEMENTS ‘vetEnd’) = First(ELEMENTS) = First(CONSTANT) = {‘cteNumInt’, ‘cteNumReal’, ‘cteBool’, ‘cteLit’, ‘cteSermo’} = d49
First(‘vetEnd’) = {‘vetEnd’} = d50

ELEMENTS = **(51)** CONSTANT ELEMENTSFAT
First(CONSTANT ELEMENTSFAT) = First(CONSTANT) = {‘cteNumInt’, ‘cteNumReal’, ‘cteBool’, ‘cteLit’, ‘cteSermo’} = d51

ELEMENTSFAT = **(52)** ‘sepVirg’ ELEMENTS | **(53)** ε
First(‘sepVirg’ ELEMENTS) = {‘sepVirg’} = d52
Follow(ELEMENTSFAT) = {‘vetEnd’} = d53

FUNCCALL = **(54)** ‘paramBegin’ LISTPARAMSCALL ‘paramEnd’
First(‘paramBegin’ LISTPARAMSCALL ‘paramEnd’) = {‘paramBegin’} = d54

LISTPARAMSCALL = **(55)** ITEMPARAM LISTPARAMSCALLFAT
First(ITEMPARAM LISTPARAMSCALLFAT) = First(ITEMPARAM) = First(CONSTANT) U First(NAME) = {‘cteNumInt’, ‘cteNumReal’, ‘cteBool’, ‘cteLit’, ‘cteSermo’} U {‘id, ‘termCmd’} = d55

LISTPARAMSCALLFAT = **(56)** ‘sepVirg’ LISTPARAMSCALL | **(57)** Ɛ
First(‘sepVirg’ LISTPARAMSCALL) = {‘sepVirg’} = d56
Follow(LISTPARAMSCALLFAT) = {‘paramEnd’} = d57

ITEMPARAM = **(58)** CONSTANT | **(59)** NAME
First(CONSTANT) = {‘cteNumInt’, ‘cteNumReal’, ‘cteBool’, ‘cteLit’, ‘cteSermo’} = d58
First(NAME) = {‘id’} = d59

WRITE = **(60)** ‘prScribo’ ‘paramBegin’ MESSAGE ‘paramEnd’
First(‘prScribo’ ‘paramBegin’ MESSAGE ‘paramEnd’) = {‘prScribo’} = d60

MESSAGE = **(61)** ‘cteSermo’ MESSAGEFAT | **(62)** NAME MESSAGEFAT
First(‘cteSermo’ MESSAGEFAT) = {‘cteSermo’} = d61
First(NAME MESSAGEFAT) = {‘id’} = d62

MESSAGEFAT = **(63)** ‘opCon’ MESSAGE | **(64)** Ɛ
First(‘opCon’ MESSAGE) = {‘opCon’} = d63
Follow(MESSAGEFAT) = {‘paramEnd’} = d64

READ = **(65)** ‘prLectio’ ‘paramBegin’ NAME ‘paramEnd’
First(‘prLectio’ ‘paramBegin’ NAME ‘paramEnd’) = {‘prLectio’} = d65

IFELSE = **(66)** IF ELSEIF ELSE
First(IF ELSEIF ELSE) = First(IF) = {‘selSi’} = d66

IF = **(67)** ‘selSi’ ‘paramBegin’ Eb ‘paramEnd’ SCOPE
First(‘selSi’ ‘paramBegin’ A ‘paramEnd’ SCOPE) = {‘selSi’} = d67

ELSEIF = **(68)** ‘selSialiud’ ‘paramBegin’ Eb ‘paramEnd’ ‘escBegin’ COMMANDS ‘escEnd’ ELSEIF | **(69)** Ɛ
First(‘selSialiud’ ‘paramBegin’ A ‘paramEnd’ SCOPE ELSEIF) = {‘selSialiud’} = d68
Follow(ELSEIF) = {‘selAliud’, ‘termCmd’} = d69

ELSE = **(70)** ‘selAliud’ ‘escBegin’ COMMANDS ‘escEnd’| **(71)** Ɛ
First(‘selAliud’ SCOPE) = {‘selAliud’} = d70
Follow(ELSE) = {‘termCmd’} = d71

WHILE = **(72)** ‘repDum’ ‘paramBegin’ Eb ‘paramEnd’ ‘escBegin’ COMMANDS ‘escEnd’
First(‘repDum’ ‘paramBegin’ A ‘paramEnd’ SCOPE) = {‘repDum’} = d72

DOWHILE = **(73)** ‘repFacite’ ‘escBegin’ COMMANDS ‘escEnd’
‘repDum’ ‘paramBegin’ Eb ‘paramEnd’
First(‘repFacite’ SCOPE ‘repDum’ ‘paramBegin’ A ‘paramEnd’) = {‘repFacite’} = d73

FOR = **(74)** ‘repQuia’ ‘id’ ‘repIn’ ‘repSpatium’ ‘paramBegin’ ITEMPARAM ‘sepVirg’ ITEMPARAM ‘sepVirg’ ITEMPARAM ‘paramEnd’ ‘escBegin’ COMMANDS ‘escEnd’
First(‘repQuia’ ‘id’ ‘repIn’ ‘repSpatium’ ‘paramBegin’ ITEMPARAM ‘sepVirg’ ITEMPARAM ‘sepVirg’ ITEMPARAM ‘paramEnd’ SCOPE) = {‘repQuia’} = d74

RETURN = **(75)** ‘prReditus’ RETURNFAT
First(‘prReditus’ RETURNFAT) = {‘prReditus’} = d75

RETURNFAT = **(76)** CONSTANT | **(77)** NAME
First(CONSTANT) = {‘cteNumInt’, ‘cteNumReal’, ‘cteBool’, ‘cteLit’, ‘cteSermo’} = d76
First(NAME) = {‘id’} = d77

Eb = **(78)** Tb Ebr
Ebr = **(79)** 'opLogOr' Tb Ebr | **(80)** Ɛ
First(Tb Ebr) = First(Tb) = First(Fb) = First(Erel2) = First(Erel1) = First(Ea) = First(Ta) U
First(Fa) = {‘opLogNeg’,’opAritUn’, ‘paramBegin’, ‘cteNumInt’, ‘cteNumReal’, ‘cteBool’, ‘cteLit’, ‘cteSermo’, ’id’} = d78
First('opLogOr' Tb Ebr) = {‘opLogOr’} = d79
Follow(Ebr) = {‘paramEnd’, ‘termCmd’,’vetEnd’} = d80

Tb = **(81)** Fb Tbr
Tbr = **(82)** 'opLogAnd' Fb Tbr | **(83)** Ɛ
First(Fb Tbr) = {‘‘opLogNeg’,’opAritUn’, ‘paramBegin’, ‘cteNumInt’, ‘cteNumReal’, ‘cteBool’, ‘cteLit’, ‘cteSermo’, ’id’} = d81
First('opLogAnd' Fb Tbr) = {‘opLogAnd’} = d82
Follow(Tbr) = {‘opLogOr’, ‘paramEnd’, ‘termCmd’,’vetEnd’} = d83

Fb = **(84)** Erel2 Fbr
Fbr = **(85)** 'opRel2' Erel2 Fbr | **(86)** Ɛ
First(Erel2 Fbr) = {‘‘opLogNeg’,’opAritUn’, ‘paramBegin’, ‘cteNumInt’, ‘cteNumReal’, ‘cteBool’, ‘cteLit’, ‘cteSermo’, ’id’} = d84
First('opRel2' Erel2 Fbr) = {‘opRel2’} = d85
Follow(Cr) = {‘opLogAnd’, ‘opLogOr’, ‘paramEnd’, ‘termCmd’,’vetEnd’} = d86

Erel2 = **(87)** Erel1 Erel2r
Erel2r = **(88)** 'opRel1' Erel1 Erel2r | **(89)** Ɛ
First(Erel1 Erel2r) = {‘‘opLogNeg’,’opAritUn’, ‘paramBegin’, ‘cteNumInt’, ‘cteNumReal’, ‘cteBool’, ‘cteLit’, ‘cteSermo’, ’id’} = d87
First('opRel1' Erel1 Erel2r) = {‘opRel1’} = d88
Follow(Erel2r) = {‘opRel2’, ‘opLogAnd’, ‘opLogOr’, ‘paramEnd’, ‘termCmd’,’vetEnd’} = d89

Erel1 = **(90)** Ea Erel1r
Erel1r =**(91)** 'opAritAd' Ea Erel1r | **(92)** ℇ
First(Ea Erel1r) = {‘‘opLogNeg’,’opAritUn’, ‘paramBegin’, ‘cteNumInt’, ‘cteNumReal’, ‘cteBool’, ‘cteLit’, ‘cteSermo’, ’id’} = d90
First('opAritAd' Ea Erel1r) = {‘opAritAd’} = d91
Follow(Erel1r) = {‘opRel1‘, opRel2’, ‘opLogAnd’, ‘opLogOr’, ‘paramEnd’, ‘termCmd’,’vetEnd’} = d92

Ea = **(93)** Ta Ear
Ear = **(94)** 'opAritMul' Ta Ear | **(95)** ℇ
First(Ta Ear) = {‘opLogNeg,’opAritUn’, ‘paramBegin’, ‘cteNumInt’, ‘cteNumReal’, ‘cteBool’, ‘cteLit’, ‘cteSermo’, ’id’} = d93
First('opAritMul' Ta Ear) = {‘opAritMul’} = d94
Follow(Ear) = {‘opAritAd’, ‘opRel1‘, opRel2’, ‘opLogAnd’, ‘opLogOr’, ‘paramEnd’, ‘termCmd’,’vetEnd’} = d95

Ta = **(96)** ‘opAritUn’ Ta | **(97)** ‘opLogNeg’ Ta | **(98)** Fa
First(‘opAritUn’ Ta) = {‘opAritUn’} = d96
First(‘opLogNeg’ Ta) = {‘opLogNeg’} = d97
First(Fa) = {‘paramBegin’, ‘cteNumInt’, ‘cteNumReal’, ‘cteBool’, ‘cteLit’, ‘cteSermo’, ’id’} = d98

Fa = **(99)** ‘paramBegin’ Eb ‘paramEnd’
First(‘paramBegin’ Eb ‘paramEnd’) = {‘paramBegin’} = d99

Fa = **(100)** CONSTANT
First(CONSTANT) = {‘cteNumInt’, ‘cteNumReal’, ‘cteBool’, ‘cteLit’, ‘cteSermo’} = d100

Fa = **(101)** ’id’ Far
First(’id’ Far) = {‘id’} = d101

Far = **(102)** ‘vetBegin’ Eb ‘vetEnd’ | **(103)** ℇ
First(‘vetBegin’ Eb ‘vetEnd’) = {‘vetBegin’} = d102
Follow(Far) = Follow(Fa) = {‘opAritMul’, ‘opAritAd’, ‘opRel1‘, opRel2’, ‘opLogAnd’, ‘opLogOr’, ‘paramEnd’, ‘termCmd’,’vetEnd’} = d103

Gramática normal que não está na forma LL(1)

PROGRAM = **(1)** ‘prDuma’ ‘id’ BEGIN

BEGIN = **(2)** FUNCTIONS INITIUM

FUNCTIONS = **(3)** RETURNTYPE ‘id’ PARAMS SCOPE FUNCTIONS | **(4)** Ɛ

INITIUM = **(5)** ‘prInitials’ ‘tdInanis’ ‘prInitium’ ‘paramBegin’ ‘paramEnd’ SCOPE

PARAMS = (6) ‘paramBegin’ | (7) ‘paramEnd’ | (8) LISTPARAMS ‘paramEnd’

LISTPARAMS = (9) TYPE NAME ‘sepVirg’ LISTPARAMS | (10) TYPE NAME | (11) ‘prMatrix’ TYPE NAME | (12) ‘prMatrix’ TYPE NAME ‘sepVirg’ LISTPARAMS

RETURNTYPE = (13) TYPE | (14) ‘prMatrix’ TYPE

TYPE = (15) ‘tdInanis’ | (16) ‘tdInt’ | (17) ‘tdReal’ | (18) ‘tdLit’ | (19) ‘tdBool’ | (20) ‘tdSermo’

CONSTANT = (21) ‘cteNumInt’ | (22) ‘cteNumReal’ | (23) ‘cteLit’ | (24) ‘cteSermo’ | (25) ‘cteBool’

NAME = (26) ‘id’ ‘vetBegin’ Eb ‘vetEnd’ | (27) ‘id’

SCOPE = (28) ‘escBegin’ COMMANDS ‘escEnd’ ‘termCmd’

COMMANDS = (29) CMD ‘termCmd’ COMMANDS | (30) Ɛ

CMD = (31) DECLARATION | (32) ‘id’ ATTRIBUTION | (33) ‘id’ FUNCCALL | (34) WRITE | (35) READ | (36) IFELSE | (37) WHILE | (38) DOWHILE | (39) FOR | (40) RETURN

DECLARATION = (41) TYPE NAME | (42) ‘prMatrix’ TYPE NAME

ATTRIBUTION = (43) ‘vetBegin’ Eb ‘vetEnd’ ‘instAtrib’ VALUE

VALUE = (44) ARRAY | (45) Eb

ARRAY = (46) ‘vetBegin’ ELEMENTS ‘vetEnd’ | (47) ‘vetBegin’ ‘vetEnd’

ELEMENTS = (48) CONSTANT ‘sepVirg’ ELEMENTS | (49) CONSTANT

FUNCCALL = (50) ‘paramBegin’ LISTPARAMSCALL ‘paramEnd’

LISTPARAMSCALL = (51) ITEMPARAM ‘sepVirg’ LISTPARAMSCALL | (52) ITEMPARAM

ITEMPARAM = (53) CONSTANT | (54) NAME

WRITE = (55) ‘prScribo’ ‘paramBegin’ MESSAGE ‘paramEnd’

MESSAGE = (56) ‘cteSermo’ | (57) ‘cteSermo’ ‘opCon’ MESSAGE | (58) NAME | (59) NAME ‘opCon’ MESSAGE

READ = (60) ‘prLectio’ ‘paramBegin’ NAME ‘paramEnd’

IFELSE = (61) IF ELSEIF ELSE

IF = (62) ‘selSi’ ‘paramBegin’ A ‘paramEnd’ ‘escBegin’ COMMANDS ‘escEnd’

ELSEIF = (63) ‘selSialiud’ ‘paramBegin’ Eb ‘paramEnd’ ‘escBegin’ COMMANDS ‘escEnd’ ELSEIF | (64) Ɛ

ELSE = (65) ‘selAliud’ ‘escBegin’ COMMANDS ‘escEnd’ | (66) Ɛ

WHILE = (67) ‘repDum’ ‘paramBegin’ A ‘paramEnd’ ‘escBegin’ COMMANDS ‘escEnd’

DOWHILE = (68) ‘repFacite’ ‘escBegin’ COMMANDS ‘escEnd’
‘repDum’ ‘paramBegin’ Eb ‘paramEnd’

FOR = (69) ‘repQuia’ ‘id’ ‘repIn’ ‘repSpatium’ ‘paramBegin’ ITEMPARAM ‘sepVirg’ ITEMPARAM ‘sepVirg’ ITEMPARAM ‘paramEnd’ ‘escBegin’ COMMANDS ‘escEnd’

RETURN = (70) ‘prReditus’ CONSTANT | (71) ‘prReditus’ NAME

Eb = (72) Eb ‘opLogOr’ Tb | (73) Tb

Tb = (74) Tb ‘opLogAnd’ Fb | (75) Fb

Fb = (76) Fb ‘opRel2’ Erel2 | (77) Erel2

Erel2 = (78) Erel2 ‘opRel1’ Erel1 | (79) Erel1

Erel1 = (80) Erel1 ‘opAritAd’ Ea | (81) Ea

Ea = (82) Ea ‘opAritMul’ Ta | (83) Ta

Ta = (84) ‘opAritUn’ Ta | (85) Fa

Ta = (86) ‘opLogNeg’ Ta | (87) Fa

Fa = (88) ‘paramBegin’ Eb ‘paramEnd’

Fa = (89) CONSTANT

Fa = (90) ’id’

Fa = (91) ‘id’ ‘vetBegin’ A ‘vetEnd’