# Grammar Rules

Group 51
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1 program => moduleDeclarations otherModules1 driverModule otherModules2
2 moduleDeclarations => moduleDeclaration moduleDeclarations1
3 moduleDeclarations => epsilon
4 moduleDeclaration => DECLARE MODULE ID SEMICOL
5 otherModules => module otherModules1
6 otherModules => epsilon
7 driverModule => DRIVERDEF DRIVER PROGRAM DRIVERENDDEF moduleDef
8 module => DEF MODULE ID ENDDEF TAKES INPUT SQBO inputPList SQBC SEMICOL ret moduleDef
9 ret => RETURNS SQBO outputPList SQBC SEMICOL
10 ret => epsilon
11 inputPList => ID COLON dataType iPList2
12 iPList2 => COMMA ID COLON dataType iPList21
13 iPList2 => epsilon
14 outputPList => ID COLON type oPList2
15 oPList2 => COMMA ID COLON type oPList2
16 oPList2 => epsilon
17 dataType => INTEGER
18 dataType => REAL
19 dataType => BOOLEAN
20 dataType => ARRAY SQBO arrRange SQBC OF type
21 arrRange => signedIndex1 RANGEOP signedIndex2
22 type => INTEGER
23 type => REAL
24 type => BOOLEAN
25 moduleDef => START statements END
26 statements => statement statements1
27 statements => epsilon
28 statement => ioStmt
29 statement => simpleStmt
30 statement => declareStmt
31 statement => conditionalStmt
32 statement => iterativeStmt
33 ioStmt => GET_VALUE BO ID BC SEMICOL
34 ioStmt => PRINT BO varPrint BC SEMICOL
35 varPrint => ID arrIndex
36 varPrint => NUM
37 varPrint => RNUM
38 varPrint => boolConst
39 boolConst => TRUE
40 boolConst => FALSE

41 arrIndex => SQBO signedIndex SQBC
42 arrIndex => epsilon
43 simpleStmt => moduleReuseStmt
44 simpleStmt => assignmentStmt
45 assignmentStmt => ID whichStmt
46 whichStmt => lValueIDStmt
47 whichStmt => lValueArrStmt
48 lValueIDStmt => ASSIGNOP expression SEMICOL
49 lValueArrStmt => SQBO indexWithExpressions SQBC ASSIGNOP expression SEMICOL
50 signedIndex => sign index
51 index => NUM
52 index => ID
53 sign => PLUS
54 sign => MINUS
55 sign => epsilon
56 moduleReuseStmt => optional USE MODULE ID WITH PARAMETERS actualPList SEMICOL
57 actualPList => sign param actualPList2
58 actualPList2 => COMMA sign param actualPList21
59 actualPList2 => epsilon
60 param => NUM
61 param => RNUM
62 param => boolConst
63 param => ID arrIndexWithExpressions
64 optional => SQBO idList SQBC ASSIGNOP
65 optional => epsilon
66 idList => ID idList2
67 idList2 => COMMA ID idList21
68 idList2 => epsilon
69 expression => arithmeticOrLogicalExpr
70 expression => unaryOpExpr
71 unaryOpExpr => unaryOp unsignedArithExpr
72 unsignedArithExpr => BO arithmeticExpr BC
73 unsignedArithExpr => varIDNum
74 unaryOp => PLUS
75 unaryOp => MINUS
76 varIDNum => ID
77 varIDNum => NUM
78 varIDNum => RNUM
79 arithmeticOrLogicalExpr => anyTerm logicalOpExpr
80 logicalOpExpr => logicalOp anyTerm logicalOpExpr1
81 logicalOpExpr => epsilon
82 anyTerm => arithmeticExpr relationOpExpr
83 relationOpExpr => relationalOp arithmeticExpr
84 relationOpExpr => epsilon
85 arithmeticExpr => term addSubExpr
86 addSubExpr => addSubOp term addSubExpr1
87 addSubExpr => epsilon
88 term => factor mulDivExpr

89 mulDivExpr => mulDivOp factor mulDivExpr1
90 mulDivExpr => epsilon
91 factor => BO arithmeticOrLogicalExpr BC
92 factor => NUM
93 factor => RNUM
94 factor => boolConst
95 factor => ID arrIndexWithExpressions
96 arrIndexWithExpressions => SQBO indexWithExpressions SQBC
97 arrIndexWithExpressions => epsilon
98 indexWithExpressions => sign arrExpr
99 arrExpr => arrTerm arrAddSubExpr
100 arrAddSubExpr => addSubOp arrTerm arrAddSubExpr1
101 arrAddSubExpr => epsilon
102 arrTerm => arrFactor arrMulDivExpr
103 arrMulDivExpr => mulDivOp arrFactor arrMulDivExpr1
104 arrMulDivExpr => epsilon
105 arrFactor => ID
106 arrFactor => NUM
107 arrFactor => boolConst
108 arrFactor => BO arrExpr BC
109 addSubOp => PLUS
110 addSubOp => MINUS
111 mulDivOp => MUL
112 mulDivOp => DIV
113 logicalOp => AND
114 logicalOp => OR
115 relationalOp => LT
116 relationalOp => LE
117 relationalOp => GT
118 relationalOp => GE
119 relationalOp => EQ
120 relationalOp => NE
121 declareStmt => DECLARE idList COLON dataType SEMICOL
122 conditionalStmt => SWITCH BO ID BC START caseStmts defaultCase END
123 caseStmts => CASE caseValue COLON statements BREAK SEMICOL caseStmts2
124 caseStmts2 => CASE caseValue COLON statements BREAK SEMICOL caseStmts21
125 caseStmts2 => epsilon
126 caseValue => NUM
127 caseValue => boolConst
128 defaultCase => DEFAULT COLON statements BREAK SEMICOL
129 defaultCase => epsilon
130 iterativeStmt => FOR BO ID IN forLoopRange BC START statements END
131 iterativeStmt => WHILE BO arithmeticOrLogicalExpr BC START statements END
132 forLoopRange => forLoopIndex1 RANGEOP forLoopIndex2
133 forLoopIndex => sign NUM