Info file generated by Happy Version 1.19.5 from parser/Grammar.y

state 6 contains 1 shift/reduce conflicts. state 7 contains 1 shift/reduce conflicts.
state 8 contains 1 shift/reduce conflicts.

Grammar

Grammar

%start_parser -> Prog (0) Prog -> Dcls (1) Ins -> (2) Ins -> Ins PRINT “(” STRING PrntArgs “)” “;” (3) Ins -> Ins READ “(” ID “)” “;” (4) Ins -> Ins WRITE “(” ID “)” “;” (5) Ins -> Ins ID “=” Exp “;” (6) Ins -> Ins ID “*=" Exp “;” (7) Ins -> Ins ID “+=” Exp “;” (8) Ins -> Ins BREAK “;” (9) Ins -> Ins CONTINUE “;” (10) Ins -> Ins RETURN “;” (11) Ins -> Ins EXIT “;” (12) Ins -> Ins FREE “(” ID “)” “;” (13) Ins -> Ins FREE “(” DATAID “)” “;” (14) Ins -> Ins READ “(” DATAID “)” “;” (15) Ins -> Ins IF “:” SmplDcls Ins NextIf Else END (16) Ins -> Ins WHILE Exp “:” SmplDcls Ins END (17) Ins -> Ins FOR ID “=” INT “|” INT “|” INT “:” SmplDcls Ins END (18) Ins -> Ins FOR ID “=” INT “|” INT “:” SmplDcls Ins END (19) Ins -> Ins FOR ID “=” ENUM “|” ENUM “:” SmplDcls Ins END (20) Ins -> Ins BEGIN SmplDcls Ins END (21) PrntArgs -> (22) PrntArgs -> PrntArgs “,” Exp (23) NextIf -> (24) NextIf -> NextIf ELIF “:” Ins (25) Else -> (26) Else -> ELSE “:” Ins (27) SmplDcls -> (28) SmplDcls -> SmplDcls IsGlob PrimType Ptrs ID “;” (29) SmplDcls -> SmplDcls IsGlob PrimType EmptyArrs ID “;” (30) SmplDcls -> SmplDcls IsGlob PrimType StaticArrs ID “;” (31) SmplDcls -> SmplDcls IsGlob PrimType ID “;” (32) Dcls -> (33) Dcls -> Dcls FUNC PrimType ID “(” Parameter “)” “:” SmplDcls Ins END (34) Dcls -> Dcls IsGlob PrimType Ptrs ID “;” (35) Dcls -> Dcls IsGlob PrimType EmptyArrs ID “;” (36) Dcls -> Dcls IsGlob PrimType StaticArrs ID “;” (37) Dcls -> Dcls IsGlob PrimType ID “;” (38) Dcls -> Dcls DataType DATAID “;” (39) Dcls -> Dcls ENUMDEC DATAID “{” EnumConsList “}” (40) Dcls -> Dcls STRUCTDEC DATAID “{” FieldsList “}” (41) Dcls -> Dcls UNIONDEC DATAID “{” FieldsList “}” (42) IsGlob -> (43) IsGlob -> GLOBAL (44) PrimType -> INTDEC (45) PrimType -> BOOLDEC (46) PrimType -> CHARDEC (47) PrimType -> VOIDDEC (48) PrimType -> FLOATDEC (49) DataType -> ENUMDEC (50) DataType -> STRUCTDEC (51) DataType -> UNIONDEC (52) Parameter -> (53) Parameter -> Parameters PrimType ID (54) Parameter -> Parameters DataType DATAID (55) Parameters -> (56) Parameters -> Parameters PrimType ID “,” (57) Parameters -> Parameters DataType DATAID “,” (58) EnumConsList -> ENUM (59) EnumConsList -> EnumConsList “,” ENUM (60) FieldsList -> ID “::” PrimType (61) FieldsList -> DATAID “::” DATAID (62) FieldsList -> FieldsList “,” ID “::” PrimType (63) FieldsList -> FieldsList “,” DATAID “::” DATAID (64) Ptrs -> “*" (65) Ptrs -> Ptrs “*" (66) EmptyArrs -> “[" “]” (67) EmptyArrs -> EmptyArrs “[" “]” (68) StaticArrs -> “[" INT “]” (69) StaticArrs -> StaticArrs “[" INT “]” (70) Exp -> Exp “+” Exp (71) Exp -> Exp “-” Exp (72) Exp -> Exp “^” Exp (73) Exp -> Exp “*" Exp (74) Exp -> Exp “/” Exp (75) Exp -> Exp “//” Exp (76) Exp -> Exp “%” Exp (77) Exp -> “-” Exp (78) Exp -> Exp OR Exp (79) Exp -> Exp “||” Exp (80) Exp -> Exp AND Exp (81) Exp -> Exp “&&” Exp (82) Exp -> “!” Exp (83) Exp -> Exp “<” Exp (84) Exp -> Exp “<=” Exp (85) Exp -> Exp “>” Exp (86) Exp -> Exp “>=” Exp (87) Exp -> Exp “==” Exp (88) Exp -> Exp “!=” Exp (89) Exp -> Exp “!!” Exp (90) Exp -> Exp “:” Exp (91) Exp -> ID “[" Exp “]” (92) Exp -> ID “(” Exp “)” (93) Exp -> “*" Exp (94) Exp -> “(” Exp “)” (95) Exp -> Term (96) Exp -> MALLOC “(” Exp “)” (97) Exp -> SIZEOF “(” Exp “)” (98) Exp -> SIZEOF “(” PrimType “)” (99) Exp -> GET “(” ENUM “)” (100) Term -> TRUE (101) Term -> FALSE (102) Term -> ID (103) Term -> DATAID (104) Term -> FLOAT (105) Term -> INT (106) Term -> CHAR (107)

Terminals

```
ID              { TkId       _ _ }
DATAID          { TkDId      _ _ }
INTDEC          { TkInt      _ }
BOOLDEC         { TkBool     _ }
CHARDEC         { TkChar     _ }
VOIDDEC         { TkVoid     _ }
FLOATDEC        { TkFloat    _ }
STRUCTDEC       { TkStruct   _ }
UNIONDEC        { TkUnion    _ }
ENUMDEC         { TkEnum     _ }
GLOBAL          { TKGlobal   _ }
"["             { TkLBracket   _ }
"]"             { TkRBracket   _ }
"{"             { TkLCurly   _ }
"}"             { TkRCurly   _ }
"("             { TkLRound   _ }
")"             { TkRRound   _ }
"|"             { TkPipe   _ }
"::"            { TkDColon   _ }
":"             { TkColon   _ }
";"             { TkSColon   _ }
","             { TkComma    _ }
"*="            { TkTEQ      _ }
"+="            { TkPEQ      _ }
"."             { TkDot      _ }
"!"             { TkExcMark  _ }
"!!"            { TkExcArr   _ }
"!="            { TkNEQ      _ }
"&&"            { TkDAmp     _ }
"||"            { TkPOr      _ }
AND             { TkAnd      _ }
OR              { TkOr       _ }
">="            { TkGE   _ }
"<="            { TkLE   _ }
">"             { TkGT   _ }
"<"             { TkLT   _ }
"/"             { TkIDiv   _ }
"//"            { TkDiv   _ }
"+"             { TkSum   _ }
"-"             { TkMin   _ }
```

```
"^"             { TkPower   _ }
"*"             { TkTimes   _ }
"%"             { TkMod   _ }
"=="            { TkEq   _ }
"="             { TkAssign   _ }
FUNC            { TkFunc _ }
IF              { TkIf _ }
ELIF            { TkElif _ }
ELSE            { TkElse _ }
END             { TkEnd _ }
WHILE           { TkWhile _ }
FOR             { TkFor _ }
BEGIN           { TkBegin _ }
BREAK           { TkBreak _ }
CONTINUE        { TkContinue _ }
RETURN          { TkReturn _ }
EXIT            { TkExit _ }
READ            { TkRead _ }
WRITE           { TkWrite _ }
PRINT           { TkPrint _ }
MALLOC          { TkAlloc _ }
FREE            { TkFree _ }
SIZEOF          { TkSizeOf _ }
GET             { TkGet _ }
TRUE            { TkTrue _ }
FALSE           { TkFalse   _ }
CHAR            { TkCharVal _ _ }
STRING          { TkString _ _ }
INT             { TkNum _ _ }
FLOAT           { TkFloatVal _ _ }
ENUM            { TkEnumCons _ _ }
```

Non-terminals
%start_parser rule 0 Prog rule 1 Ins rules 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21 PrntArgs rules 22, 23 NextIf rules 24, 25 Else rules 26, 27 SmplDcls rules 28, 29, 30, 31, 32 Dcls rules 33, 34, 35, 36, 37, 38, 39, 40, 41, 42 IsGlob rules 43, 44 PrimType rules 45, 46, 47, 48, 49 DataType rules 50, 51, 52 Parameter rules 53, 54, 55 Parameters rules 56, 57, 58 EnumConsList rules 59, 60 FieldsList rules 61, 62, 63, 64 Ptrs rules 65, 66 EmptyArrs rules 67, 68 StaticArrs rules 69, 70 Exp rules 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100 Term rules 101, 102, 103, 104, 105, 106, 107

States

State 0

```
INTDEC          reduce using rule 33
BOOLDEC         reduce using rule 33
CHARDEC         reduce using rule 33
VOIDDEC         reduce using rule 33
FLOATDEC        reduce using rule 33
STRUCTDEC       reduce using rule 33
UNIONDEC        reduce using rule 33
ENUMDEC         reduce using rule 33
GLOBAL          reduce using rule 33
FUNC            reduce using rule 33
%eof            reduce using rule 33

Prog            goto state 3
Dcls            goto state 2
```

State 1

```
Dcls            goto state 2
```

State 2

```
Prog -> Dcls .                                      (rule 1)
Dcls -> Dcls . FUNC PrimType ID "(" Parameter ")" ":" SmplDcls Ins END    (rule 34)
Dcls -> Dcls . IsGlob PrimType Ptrs ID ";"          (rule 35)
Dcls -> Dcls . IsGlob PrimType EmptyArrs ID ";"     (rule 36)
Dcls -> Dcls . IsGlob PrimType StaticArrs ID ";"    (rule 37)
Dcls -> Dcls . IsGlob PrimType ID ";"               (rule 38)
Dcls -> Dcls . DataType DATAID ";"                  (rule 39)
Dcls -> Dcls . ENUMDEC DATAID "{" EnumConsList "}"    (rule 40)
Dcls -> Dcls . STRUCTDEC DATAID "{" FieldsList "}"    (rule 41)
Dcls -> Dcls . UNIONDEC DATAID "{" FieldsList "}"    (rule 42)

INTDEC          reduce using rule 43
BOOLDEC         reduce using rule 43
CHARDEC         reduce using rule 43
VOIDDEC         reduce using rule 43
FLOATDEC        reduce using rule 43
STRUCTDEC       shift, and enter state 6
UNIONDEC        shift, and enter state 7
ENUMDEC         shift, and enter state 8
```

```
GLOBAL          shift, and enter state 9
FUNC            shift, and enter state 10
%eof            reduce using rule 1

IsGlob          goto state 4
DataType        goto state 5
```

State 3

```
%start_parser -> Prog .                                 (rule 0)

%eof            accept
```

State 4

```
Dcls -> Dcls IsGlob . PrimType Ptrs ID ";"              (rule 35)
Dcls -> Dcls IsGlob . PrimType EmptyArrs ID ";"         (rule 36)
Dcls -> Dcls IsGlob . PrimType StaticArrs ID ";"        (rule 37)
Dcls -> Dcls IsGlob . PrimType ID ";"                   (rule 38)

INTDEC          shift, and enter state 12
BOOLDEC         shift, and enter state 13
CHARDEC         shift, and enter state 14
VOIDDEC         shift, and enter state 15
FLOATDEC        shift, and enter state 16

PrimType        goto state 21
```

State 5

```
Dcls -> Dcls DataType . DATAID ";"                      (rule 39)

DATAID          shift, and enter state 20
```

State 6

```
Dcls -> Dcls STRUCTDEC . DATAID "{" FieldsList "}"      (rule 41)
DataType -> STRUCTDEC .                                 (rule 51)

DATAID          shift, and enter state 19
        (reduce using rule 51)
```

State 7

```
Dcls -> Dcls UNIONDEC . DATAID "{" FieldsList "}"    (rule 42)
DataType -> UNIONDEC .                               (rule 52)

DATAID          shift, and enter state 18
        (reduce using rule 52)
```

State 8

```
Dcls -> Dcls ENUMDEC . DATAID "{" EnumConsList "}"    (rule 40)
DataType -> ENUMDEC .                                (rule 50)

DATAID          shift, and enter state 17
        (reduce using rule 50)
```

State 9

```
IsGlob -> GLOBAL .                                   (rule 44)

INTDEC          reduce using rule 44
BOOLDEC         reduce using rule 44
CHARDEC         reduce using rule 44
VOIDDEC         reduce using rule 44
FLOATDEC        reduce using rule 44
```

State 10

```
Dcls -> Dcls FUNC . PrimType ID "(" Parameter ")" ":" SmplDcls Ins END    (rule 34)

INTDEC          shift, and enter state 12
BOOLDEC         shift, and enter state 13
CHARDEC         shift, and enter state 14
VOIDDEC         shift, and enter state 15
FLOATDEC        shift, and enter state 16

PrimType        goto state 11
```

State 11

```
Dcls -> Dcls FUNC PrimType . ID "(" Parameter ")" ":" SmplDcls Ins END    (rule 34)

ID              shift, and enter state 32
```

State 12

```
PrimType -> INTDEC .                                    (rule 45)

ID              reduce using rule 45
"["             reduce using rule 45
"}"             reduce using rule 45
")"             reduce using rule 45
","             reduce using rule 45
"*"             reduce using rule 45
```

State 13

```
PrimType -> BOOLDEC .                                   (rule 46)

ID              reduce using rule 46
"["             reduce using rule 46
"}"             reduce using rule 46
")"             reduce using rule 46
","             reduce using rule 46
"*"             reduce using rule 46
```

State 14

```
PrimType -> CHARDEC .                                   (rule 47)

ID              reduce using rule 47
"["             reduce using rule 47
"}"             reduce using rule 47
")"             reduce using rule 47
","             reduce using rule 47
"*"             reduce using rule 47
```

State 15

```
PrimType -> VOIDDEC .                                   (rule 48)

ID              reduce using rule 48
"["             reduce using rule 48
"}"             reduce using rule 48
")"             reduce using rule 48
","             reduce using rule 48
"*"             reduce using rule 48
```

State 16

```
PrimType -> FLOATDEC .                                (rule 49)

ID              reduce using rule 49
"["             reduce using rule 49
"}"             reduce using rule 49
")"             reduce using rule 49
","             reduce using rule 49
"*"             reduce using rule 49
```

State 17

```
Dcls -> Dcls ENUMDEC DATAID . "{" EnumConsList "}"    (rule 40)

"{"             shift, and enter state 31
```

State 18

```
Dcls -> Dcls UNIONDEC DATAID . "{" FieldsList "}"    (rule 42)

"{"             shift, and enter state 30
```

State 19

```
Dcls -> Dcls STRUCTDEC DATAID . "{" FieldsList "}"    (rule 41)

"{"             shift, and enter state 29
```

State 20

```
Dcls -> Dcls DataType DATAID . ";"                    (rule 39)

";"             shift, and enter state 28
```

State 21

```
Dcls -> Dcls IsGlob PrimType . Ptrs ID ";"            (rule 35)
Dcls -> Dcls IsGlob PrimType . EmptyArrs ID ";"       (rule 36)
Dcls -> Dcls IsGlob PrimType . StaticArrs ID ";"      (rule 37)
Dcls -> Dcls IsGlob PrimType . ID ";"                 (rule 38)

ID              shift, and enter state 25
"["             shift, and enter state 26
"*"             shift, and enter state 27
```

```
Ptrs           goto state 22
EmptyArrs      goto state 23
StaticArrs     goto state 24
```

State 22

```
Dcls -> Dcls IsGlob PrimType Ptrs . ID ";"          (rule 35)
Ptrs -> Ptrs . "*"                                  (rule 66)

ID             shift, and enter state 47
"*"            shift, and enter state 48
```

State 23

```
Dcls -> Dcls IsGlob PrimType EmptyArrs . ID ";"     (rule 36)
EmptyArrs -> EmptyArrs . "[" "]"                    (rule 68)

ID             shift, and enter state 45
"["            shift, and enter state 46
```

State 24

```
Dcls -> Dcls IsGlob PrimType StaticArrs . ID ";"    (rule 37)
StaticArrs -> StaticArrs . "[" INT "]"              (rule 70)

ID             shift, and enter state 43
"["            shift, and enter state 44
```

State 25

```
Dcls -> Dcls IsGlob PrimType ID . ";"               (rule 38)

";"            shift, and enter state 42
```

State 26

```
EmptyArrs -> "[" . "]"                              (rule 67)
StaticArrs -> "[" . INT "]"                         (rule 69)

"]"            shift, and enter state 40
INT            shift, and enter state 41
```

State 27

```
Ptrs -> "*" .                                          (rule 65)

ID              reduce using rule 65
"*"             reduce using rule 65
```

State 28

```
Dcls -> Dcls DataType DATAID ";" .                     (rule 39)

INTDEC          reduce using rule 39
BOOLDEC         reduce using rule 39
CHARDEC         reduce using rule 39
VOIDDEC         reduce using rule 39
FLOATDEC        reduce using rule 39
STRUCTDEC       reduce using rule 39
UNIONDEC        reduce using rule 39
ENUMDEC         reduce using rule 39
GLOBAL          reduce using rule 39
FUNC            reduce using rule 39
%eof            reduce using rule 39
```

State 29

```
Dcls -> Dcls STRUCTDEC DATAID "{" . FieldsList "}"    (rule 41)

ID              shift, and enter state 37
DATAID          shift, and enter state 38

FieldsList      goto state 39
```

State 30

```
Dcls -> Dcls UNIONDEC DATAID "{" . FieldsList "}"    (rule 42)

ID              shift, and enter state 37
DATAID          shift, and enter state 38

FieldsList      goto state 36
```

State 31

```
Dcls -> Dcls ENUMDEC DATAID "{" . EnumConsList "}"    (rule 40)

ENUM           shift, and enter state 35

EnumConsList   goto state 34
```

State 32

```
Dcls -> Dcls FUNC PrimType ID . "(" Parameter ")" ":" SmplDcls Ins END    (rule 34)

"("            shift, and enter state 33
```

State 33

```
Dcls -> Dcls FUNC PrimType ID "(" . Parameter ")" ":" SmplDcls Ins END    (rule 34)

INTDEC         reduce using rule 56
BOOLDEC        reduce using rule 56
CHARDEC        reduce using rule 56
VOIDDEC        reduce using rule 56
FLOATDEC       reduce using rule 56
STRUCTDEC      reduce using rule 56
UNIONDEC       reduce using rule 56
ENUMDEC        reduce using rule 56
")"            reduce using rule 53

Parameter      goto state 62
Parameters     goto state 63
```

State 34

```
Dcls -> Dcls ENUMDEC DATAID "{" EnumConsList . "}"    (rule 40)
EnumConsList -> EnumConsList . "," ENUM             (rule 60)

"}"            shift, and enter state 60
","            shift, and enter state 61
```

State 35

```
EnumConsList -> ENUM .                              (rule 59)

"}"            reduce using rule 59
","            reduce using rule 59
```

State 36

```
Dcls -> Dcls UNIONDEC DATAID "{" FieldsList . "}"    (rule 42)
FieldsList -> FieldsList . "," ID "::" PrimType     (rule 63)
FieldsList -> FieldsList . "," DATAID "::" DATAID    (rule 64)

"}"            shift, and enter state 59
","            shift, and enter state 56
```

State 37

```
FieldsList -> ID . "::" PrimType                    (rule 61)

"::"           shift, and enter state 58
```

State 38

```
FieldsList -> DATAID . "::" DATAID                  (rule 62)

"::"           shift, and enter state 57
```

State 39

```
Dcls -> Dcls STRUCTDEC DATAID "{" FieldsList . "}"    (rule 41)
FieldsList -> FieldsList . "," ID "::" PrimType     (rule 63)
FieldsList -> FieldsList . "," DATAID "::" DATAID    (rule 64)

"}"            shift, and enter state 55
","            shift, and enter state 56
```

State 40

```
EmptyArrs -> "[" "]" .                              (rule 67)

ID             reduce using rule 67
"["            reduce using rule 67
```

State 41

```
StaticArrs -> "[" INT . "]"                         (rule 69)

"]"            shift, and enter state 54
```

State 42

```
Dcls -> Dcls IsGlob PrimType ID ";" .              (rule 38)

INTDEC          reduce using rule 38
BOOLDEC         reduce using rule 38
CHARDEC         reduce using rule 38
VOIDDEC         reduce using rule 38
FLOATDEC        reduce using rule 38
STRUCTDEC       reduce using rule 38
UNIONDEC        reduce using rule 38
ENUMDEC         reduce using rule 38
GLOBAL          reduce using rule 38
FUNC            reduce using rule 38
%eof            reduce using rule 38
```

State 43

```
Dcls -> Dcls IsGlob PrimType StaticArrs ID . ";"    (rule 37)

";"             shift, and enter state 53
```

State 44

```
StaticArrs -> StaticArrs "[" . INT "]"              (rule 70)

INT             shift, and enter state 52
```

State 45

```
Dcls -> Dcls IsGlob PrimType EmptyArrs ID . ";"     (rule 36)

";"             shift, and enter state 51
```

State 46

```
EmptyArrs -> EmptyArrs "[" . "]"                    (rule 68)

"]"             shift, and enter state 50
```

State 47

```
Dcls -> Dcls IsGlob PrimType Ptrs ID . ";"          (rule 35)

";"            shift, and enter state 49
```

State 48

```
Ptrs -> Ptrs "*" .                                  (rule 66)

ID             reduce using rule 66
"*"            reduce using rule 66
```

State 49

```
Dcls -> Dcls IsGlob PrimType Ptrs ID ";" .          (rule 35)

INTDEC         reduce using rule 35
BOOLDEC        reduce using rule 35
CHARDEC        reduce using rule 35
VOIDDEC        reduce using rule 35
FLOATDEC       reduce using rule 35
STRUCTDEC      reduce using rule 35
UNIONDEC       reduce using rule 35
ENUMDEC        reduce using rule 35
GLOBAL         reduce using rule 35
FUNC           reduce using rule 35
%eof           reduce using rule 35
```

State 50

```
EmptyArrs -> EmptyArrs "[" "]" .                    (rule 68)

ID             reduce using rule 68
"["            reduce using rule 68
```

State 51

```
Dcls -> Dcls IsGlob PrimType EmptyArrs ID ";" .     (rule 36)

INTDEC         reduce using rule 36
BOOLDEC        reduce using rule 36
CHARDEC        reduce using rule 36
VOIDDEC        reduce using rule 36
FLOATDEC       reduce using rule 36
STRUCTDEC      reduce using rule 36
```

```
UNIONDEC        reduce using rule 36
ENUMDEC         reduce using rule 36
GLOBAL          reduce using rule 36
FUNC            reduce using rule 36
%eof            reduce using rule 36
```

State 52

```
StaticArrs -> StaticArrs "[" INT . "]"              (rule 70)

"]"             shift, and enter state 75
```

State 53

```
Dcls -> Dcls IsGlob PrimType StaticArrs ID ";" .    (rule 37)

INTDEC          reduce using rule 37
BOOLDEC         reduce using rule 37
CHARDEC         reduce using rule 37
VOIDDEC         reduce using rule 37
FLOATDEC        reduce using rule 37
STRUCTDEC       reduce using rule 37
UNIONDEC        reduce using rule 37
ENUMDEC         reduce using rule 37
GLOBAL          reduce using rule 37
FUNC            reduce using rule 37
%eof            reduce using rule 37
```

State 54

```
StaticArrs -> "[" INT "]" .                         (rule 69)

ID              reduce using rule 69
"["             reduce using rule 69
```

State 55

```
Dcls -> Dcls STRUCTDEC DATAID "{" FieldsList "}" .    (rule 41)

INTDEC          reduce using rule 41
BOOLDEC         reduce using rule 41
CHARDEC         reduce using rule 41
VOIDDEC         reduce using rule 41
FLOATDEC        reduce using rule 41
```

```
STRUCTDEC       reduce using rule 41
UNIONDEC        reduce using rule 41
ENUMDEC         reduce using rule 41
GLOBAL          reduce using rule 41
FUNC            reduce using rule 41
%eof            reduce using rule 41
```

State 56

```
FieldsList -> FieldsList "," . ID "::" PrimType     (rule 63)
FieldsList -> FieldsList "," . DATAID "::" DATAID    (rule 64)

ID              shift, and enter state 73
DATAID          shift, and enter state 74
```

State 57

```
FieldsList -> DATAID "::" . DATAID                  (rule 62)

DATAID          shift, and enter state 72
```

State 58

```
FieldsList -> ID "::" . PrimType                    (rule 61)

INTDEC          shift, and enter state 12
BOOLDEC         shift, and enter state 13
CHARDEC         shift, and enter state 14
VOIDDEC         shift, and enter state 15
FLOATDEC        shift, and enter state 16

PrimType        goto state 71
```

State 59

```
Dcls -> Dcls UNIONDEC DATAID "{" FieldsList "}" .    (rule 42)

INTDEC          reduce using rule 42
BOOLDEC         reduce using rule 42
CHARDEC         reduce using rule 42
VOIDDEC         reduce using rule 42
FLOATDEC        reduce using rule 42
STRUCTDEC       reduce using rule 42
UNIONDEC        reduce using rule 42
```

```
ENUMDEC         reduce using rule 42
GLOBAL          reduce using rule 42
FUNC            reduce using rule 42
%eof            reduce using rule 42
```

State 60

```
Dcls -> Dcls ENUMDEC DATAID "{" EnumConsList "}" .    (rule 40)

INTDEC          reduce using rule 40
BOOLDEC         reduce using rule 40
CHARDEC         reduce using rule 40
VOIDDEC         reduce using rule 40
FLOATDEC        reduce using rule 40
STRUCTDEC       reduce using rule 40
UNIONDEC        reduce using rule 40
ENUMDEC         reduce using rule 40
GLOBAL          reduce using rule 40
FUNC            reduce using rule 40
%eof            reduce using rule 40
```

State 61

```
EnumConsList -> EnumConsList "," . ENUM             (rule 60)

ENUM            shift, and enter state 70
```

State 62

```
Dcls -> Dcls FUNC PrimType ID "(" Parameter . ")" ":" SmplDcls Ins END    (rule 34)

")"             shift, and enter state 69
```

State 63

```
Parameter -> Parameters . PrimType ID               (rule 54)
Parameter -> Parameters . DataType DATAID           (rule 55)
Parameters -> Parameters . PrimType ID ","          (rule 57)
Parameters -> Parameters . DataType DATAID ","      (rule 58)

INTDEC          shift, and enter state 12
BOOLDEC         shift, and enter state 13
CHARDEC         shift, and enter state 14
VOIDDEC         shift, and enter state 15
```

```
FLOATDEC        shift, and enter state 16
STRUCTDEC       shift, and enter state 66
UNIONDEC        shift, and enter state 67
ENUMDEC         shift, and enter state 68

PrimType        goto state 64
DataType        goto state 65
```

State 64

```
Parameter -> Parameters PrimType . ID                (rule 54)
Parameters -> Parameters PrimType . ID ","           (rule 57)

ID              shift, and enter state 80
```

State 65

```
Parameter -> Parameters DataType . DATAID            (rule 55)
Parameters -> Parameters DataType . DATAID ","       (rule 58)

DATAID          shift, and enter state 79
```

State 66

```
DataType -> STRUCTDEC .                              (rule 51)

DATAID          reduce using rule 51
```

State 67

```
DataType -> UNIONDEC .                               (rule 52)

DATAID          reduce using rule 52
```

State 68

```
DataType -> ENUMDEC .                                (rule 50)

DATAID          reduce using rule 50
```

State 69

```
Dcls -> Dcls FUNC PrimType ID "(" Parameter ")" . ":" SmplDcls Ins END    (rule 34)

":"            shift, and enter state 78
```

State 70

```
EnumConsList -> EnumConsList "," ENUM .             (rule 60)

"}"            reduce using rule 60
","            reduce using rule 60
```

State 71

```
FieldsList -> ID "::" PrimType .                    (rule 61)

"}"            reduce using rule 61
","            reduce using rule 61
```

State 72

```
FieldsList -> DATAID "::" DATAID .                  (rule 62)

"}"            reduce using rule 62
","            reduce using rule 62
```

State 73

```
FieldsList -> FieldsList "," ID . "::" PrimType     (rule 63)

"::"           shift, and enter state 77
```

State 74

```
FieldsList -> FieldsList "," DATAID . "::" DATAID    (rule 64)

"::"           shift, and enter state 76
```

State 75

```
StaticArrs -> StaticArrs "[" INT "]" .              (rule 70)

ID             reduce using rule 70
"["            reduce using rule 70
```

State 76

```
FieldsList -> FieldsList "," DATAID "::" . DATAID    (rule 64)

DATAID          shift, and enter state 85
```

State 77

```
FieldsList -> FieldsList "," ID "::" . PrimType     (rule 63)

INTDEC          shift, and enter state 12
BOOLDEC         shift, and enter state 13
CHARDEC         shift, and enter state 14
VOIDDEC         shift, and enter state 15
FLOATDEC        shift, and enter state 16

PrimType        goto state 84
```

State 78

```
Dcls -> Dcls FUNC PrimType ID "(" Parameter ")" ":" . SmplDcls Ins END    (rule 34)

ID              reduce using rule 28
INTDEC          reduce using rule 28
BOOLDEC         reduce using rule 28
CHARDEC         reduce using rule 28
VOIDDEC         reduce using rule 28
FLOATDEC        reduce using rule 28
GLOBAL          reduce using rule 28
IF              reduce using rule 28
END             reduce using rule 28
WHILE           reduce using rule 28
FOR             reduce using rule 28
BEGIN           reduce using rule 28
BREAK           reduce using rule 28
CONTINUE        reduce using rule 28
RETURN          reduce using rule 28
EXIT            reduce using rule 28
READ            reduce using rule 28
WRITE           reduce using rule 28
PRINT           reduce using rule 28
FREE            reduce using rule 28

SmplDcls        goto state 83
```

State 79

```
Parameter -> Parameters DataType DATAID .           (rule 55)
Parameters -> Parameters DataType DATAID . ","      (rule 58)

")"            reduce using rule 55
","            shift, and enter state 82
```

State 80

```
Parameter -> Parameters PrimType ID .               (rule 54)
Parameters -> Parameters PrimType ID . ","          (rule 57)

")"            reduce using rule 54
","            shift, and enter state 81
```

State 81

```
Parameters -> Parameters PrimType ID "," .          (rule 57)

INTDEC         reduce using rule 57
BOOLDEC        reduce using rule 57
CHARDEC        reduce using rule 57
VOIDDEC        reduce using rule 57
FLOATDEC       reduce using rule 57
STRUCTDEC      reduce using rule 57
UNIONDEC       reduce using rule 57
ENUMDEC        reduce using rule 57
```

State 82

```
Parameters -> Parameters DataType DATAID "," .      (rule 58)

INTDEC         reduce using rule 58
BOOLDEC        reduce using rule 58
CHARDEC        reduce using rule 58
VOIDDEC        reduce using rule 58
FLOATDEC       reduce using rule 58
STRUCTDEC      reduce using rule 58
UNIONDEC       reduce using rule 58
ENUMDEC        reduce using rule 58
```

State 83

```
SmplDcls -> SmplDcls . IsGlob PrimType Ptrs ID ";"    (rule 29)
SmplDcls -> SmplDcls . IsGlob PrimType EmptyArrs ID ";"    (rule 30)
SmplDcls -> SmplDcls . IsGlob PrimType StaticArrs ID ";"    (rule 31)
SmplDcls -> SmplDcls . IsGlob PrimType ID ";"       (rule 32)
Dcls -> Dcls FUNC PrimType ID "(" Parameter ")" ":" SmplDcls . Ins END    (rule 34)

ID              reduce using rule 2
INTDEC          reduce using rule 43
BOOLDEC         reduce using rule 43
CHARDEC         reduce using rule 43
VOIDDEC         reduce using rule 43
FLOATDEC        reduce using rule 43
GLOBAL          shift, and enter state 9
IF              reduce using rule 2
END             reduce using rule 2
WHILE           reduce using rule 2
FOR             reduce using rule 2
BEGIN           reduce using rule 2
BREAK           reduce using rule 2
CONTINUE        reduce using rule 2
RETURN          reduce using rule 2
EXIT            reduce using rule 2
READ            reduce using rule 2
WRITE           reduce using rule 2
PRINT           reduce using rule 2
FREE            reduce using rule 2

Ins             goto state 86
IsGlob          goto state 87
```

State 84

```
FieldsList -> FieldsList "," ID "::" PrimType .     (rule 63)

"}"             reduce using rule 63
","             reduce using rule 63
```

State 85

```
FieldsList -> FieldsList "," DATAID "::" DATAID .    (rule 64)

"}"             reduce using rule 64
","             reduce using rule 64
```

State 86

```
Ins -> Ins . PRINT "(" STRING PrntArgs ")" ";"      (rule 3)
Ins -> Ins . READ "(" ID ")" ";"                    (rule 4)
Ins -> Ins . WRITE "(" ID ")" ";"                   (rule 5)
Ins -> Ins . ID "=" Exp ";"                         (rule 6)
Ins -> Ins . ID "*=" Exp ";"                        (rule 7)
Ins -> Ins . ID "+=" Exp ";"                        (rule 8)
Ins -> Ins . BREAK ";"                              (rule 9)
Ins -> Ins . CONTINUE ";"                           (rule 10)
Ins -> Ins . RETURN ";"                             (rule 11)
Ins -> Ins . EXIT ";"                               (rule 12)
Ins -> Ins . FREE "(" ID ")" ";"                    (rule 13)
Ins -> Ins . FREE "(" DATAID ")" ";"                (rule 14)
Ins -> Ins . READ "(" DATAID ")" ";"                (rule 15)
Ins -> Ins . IF ":" SmplDcls Ins NextIf Else END    (rule 16)
Ins -> Ins . WHILE Exp ":" SmplDcls Ins END         (rule 17)
Ins -> Ins . FOR ID "=" INT "|" INT "|" INT ":" SmplDcls Ins END    (rule 18)
Ins -> Ins . FOR ID "=" INT "|" INT ":" SmplDcls Ins END    (rule 19)
Ins -> Ins . FOR ID "=" ENUM "|" ENUM ":" SmplDcls Ins END    (rule 20)
Ins -> Ins . BEGIN SmplDcls Ins END                 (rule 21)
Dcls -> Dcls FUNC PrimType ID "(" Parameter ")" ":" SmplDcls Ins . END    (rule 34)

ID              shift, and enter state 89
IF              shift, and enter state 90
END             shift, and enter state 91
WHILE           shift, and enter state 92
FOR             shift, and enter state 93
BEGIN           shift, and enter state 94
BREAK           shift, and enter state 95
CONTINUE        shift, and enter state 96
RETURN          shift, and enter state 97
EXIT            shift, and enter state 98
READ            shift, and enter state 99
WRITE           shift, and enter state 100
PRINT           shift, and enter state 101
FREE            shift, and enter state 102
```

State 87

```
SmplDcls -> SmplDcls IsGlob . PrimType Ptrs ID ";"    (rule 29)
SmplDcls -> SmplDcls IsGlob . PrimType EmptyArrs ID ";"    (rule 30)
SmplDcls -> SmplDcls IsGlob . PrimType StaticArrs ID ";"    (rule 31)
SmplDcls -> SmplDcls IsGlob . PrimType ID ";"       (rule 32)

INTDEC          shift, and enter state 12
BOOLDEC         shift, and enter state 13
```

```
CHARDEC        shift, and enter state 14
VOIDDEC        shift, and enter state 15
FLOATDEC       shift, and enter state 16

PrimType       goto state 88
```

State 88

```
SmplDcls -> SmplDcls IsGlob PrimType . Ptrs ID ";"    (rule 29)
SmplDcls -> SmplDcls IsGlob PrimType . EmptyArrs ID ";"    (rule 30)
SmplDcls -> SmplDcls IsGlob PrimType . StaticArrs ID ";"    (rule 31)
SmplDcls -> SmplDcls IsGlob PrimType . ID ";"       (rule 32)

ID             shift, and enter state 136
"["            shift, and enter state 26
"*"            shift, and enter state 27

Ptrs           goto state 133
EmptyArrs      goto state 134
StaticArrs     goto state 135
```

State 89

```
Ins -> Ins ID . "=" Exp ";"                         (rule 6)
Ins -> Ins ID . "*=" Exp ";"                        (rule 7)
Ins -> Ins ID . "+=" Exp ";"                        (rule 8)

"*="           shift, and enter state 130
"+="           shift, and enter state 131
"="            shift, and enter state 132
```

State 90

```
Ins -> Ins IF . ":" SmplDcls Ins NextIf Else END    (rule 16)

":"            shift, and enter state 129
```

State 91

```
Dcls -> Dcls FUNC PrimType ID "(" Parameter ")" ":" SmplDcls Ins END .    (rule 34)

INTDEC         reduce using rule 34
BOOLDEC        reduce using rule 34
CHARDEC        reduce using rule 34
```

```
VOIDDEC         reduce using rule 34
FLOATDEC        reduce using rule 34
STRUCTDEC       reduce using rule 34
UNIONDEC        reduce using rule 34
ENUMDEC         reduce using rule 34
GLOBAL          reduce using rule 34
FUNC            reduce using rule 34
%eof            reduce using rule 34
```

State 92

```
Ins -> Ins WHILE . Exp ":" SmplDcls Ins END         (rule 17)

ID              shift, and enter state 115
DATAID          shift, and enter state 116
"("             shift, and enter state 117
"!"             shift, and enter state 118
"-"             shift, and enter state 119
"*"             shift, and enter state 120
MALLOC          shift, and enter state 121
SIZEOF          shift, and enter state 122
GET             shift, and enter state 123
TRUE            shift, and enter state 124
FALSE           shift, and enter state 125
CHAR            shift, and enter state 126
INT             shift, and enter state 127
FLOAT           shift, and enter state 128

Exp             goto state 113
Term            goto state 114
```

State 93

```
Ins -> Ins FOR . ID "=" INT "|" INT "|" INT ":" SmplDcls Ins END    (rule 18)
Ins -> Ins FOR . ID "=" INT "|" INT ":" SmplDcls Ins END    (rule 19)
Ins -> Ins FOR . ID "=" ENUM "|" ENUM ":" SmplDcls Ins END    (rule 20)

ID              shift, and enter state 112
```

State 94

```
Ins -> Ins BEGIN . SmplDcls Ins END                 (rule 21)

ID              reduce using rule 28
```

```
INTDEC          reduce using rule 28
BOOLDEC         reduce using rule 28
CHARDEC         reduce using rule 28
VOIDDEC         reduce using rule 28
FLOATDEC        reduce using rule 28
GLOBAL          reduce using rule 28
IF              reduce using rule 28
END             reduce using rule 28
WHILE           reduce using rule 28
FOR             reduce using rule 28
BEGIN           reduce using rule 28
BREAK           reduce using rule 28
CONTINUE        reduce using rule 28
RETURN          reduce using rule 28
EXIT            reduce using rule 28
READ            reduce using rule 28
WRITE           reduce using rule 28
PRINT           reduce using rule 28
FREE            reduce using rule 28

SmplDcls        goto state 111
```

State 95

```
Ins -> Ins BREAK . ";"                              (rule 9)

";"             shift, and enter state 110
```

State 96

```
Ins -> Ins CONTINUE . ";"                           (rule 10)

";"             shift, and enter state 109
```

State 97

```
Ins -> Ins RETURN . ";"                             (rule 11)

";"             shift, and enter state 108
```

State 98

```
Ins -> Ins EXIT . ";"                               (rule 12)

";"             shift, and enter state 107
```

State 99

```
Ins -> Ins READ . "(" ID ")" ";"                    (rule 4)
Ins -> Ins READ . "(" DATAID ")" ";"                (rule 15)

"("             shift, and enter state 106
```

State 100

```
Ins -> Ins WRITE . "(" ID ")" ";"                   (rule 5)

"("             shift, and enter state 105
```

State 101

```
Ins -> Ins PRINT . "(" STRING PrntArgs ")" ";"      (rule 3)

"("             shift, and enter state 104
```

State 102

```
Ins -> Ins FREE . "(" ID ")" ";"                    (rule 13)
Ins -> Ins FREE . "(" DATAID ")" ";"                (rule 14)

"("             shift, and enter state 103
```

State 103

```
Ins -> Ins FREE "(" . ID ")" ";"                    (rule 13)
Ins -> Ins FREE "(" . DATAID ")" ";"                (rule 14)

ID              shift, and enter state 180
DATAID          shift, and enter state 181
```

State 104

```
Ins -> Ins PRINT "(" . STRING PrntArgs ")" ";"      (rule 3)

STRING          shift, and enter state 179
```

State 105

```
Ins -> Ins WRITE "(" . ID ")" ";"                    (rule 5)

ID              shift, and enter state 178
```

State 106

```
Ins -> Ins READ "(" . ID ")" ";"                     (rule 4)
Ins -> Ins READ "(" . DATAID ")" ";"                 (rule 15)

ID              shift, and enter state 176
DATAID          shift, and enter state 177
```

State 107

```
Ins -> Ins EXIT ";" .                                (rule 12)

ID              reduce using rule 12
IF              reduce using rule 12
ELIF            reduce using rule 12
ELSE            reduce using rule 12
END             reduce using rule 12
WHILE           reduce using rule 12
FOR             reduce using rule 12
BEGIN           reduce using rule 12
BREAK           reduce using rule 12
CONTINUE        reduce using rule 12
RETURN          reduce using rule 12
EXIT            reduce using rule 12
READ            reduce using rule 12
WRITE           reduce using rule 12
PRINT           reduce using rule 12
FREE            reduce using rule 12
```

State 108

```
Ins -> Ins RETURN ";" .                              (rule 11)

ID              reduce using rule 11
IF              reduce using rule 11
ELIF            reduce using rule 11
ELSE            reduce using rule 11
END             reduce using rule 11
WHILE           reduce using rule 11
FOR             reduce using rule 11
```

```
BEGIN          reduce using rule 11
BREAK          reduce using rule 11
CONTINUE       reduce using rule 11
RETURN         reduce using rule 11
EXIT           reduce using rule 11
READ           reduce using rule 11
WRITE          reduce using rule 11
PRINT          reduce using rule 11
FREE           reduce using rule 11
```

State 109

```
Ins -> Ins CONTINUE ";" .                              (rule 10)

ID             reduce using rule 10
IF             reduce using rule 10
ELIF           reduce using rule 10
ELSE           reduce using rule 10
END            reduce using rule 10
WHILE          reduce using rule 10
FOR            reduce using rule 10
BEGIN          reduce using rule 10
BREAK          reduce using rule 10
CONTINUE       reduce using rule 10
RETURN         reduce using rule 10
EXIT           reduce using rule 10
READ           reduce using rule 10
WRITE          reduce using rule 10
PRINT          reduce using rule 10
FREE           reduce using rule 10
```

State 110

```
Ins -> Ins BREAK ";" .                                 (rule 9)

ID             reduce using rule 9
IF             reduce using rule 9
ELIF           reduce using rule 9
ELSE           reduce using rule 9
END            reduce using rule 9
WHILE          reduce using rule 9
FOR            reduce using rule 9
BEGIN          reduce using rule 9
BREAK          reduce using rule 9
CONTINUE       reduce using rule 9
```

```
RETURN          reduce using rule 9
EXIT            reduce using rule 9
READ            reduce using rule 9
WRITE           reduce using rule 9
PRINT           reduce using rule 9
FREE            reduce using rule 9
```

State 111

```
Ins -> Ins BEGIN SmplDcls . Ins END                 (rule 21)
SmplDcls -> SmplDcls . IsGlob PrimType Ptrs ID ";"    (rule 29)
SmplDcls -> SmplDcls . IsGlob PrimType EmptyArrs ID ";"    (rule 30)
SmplDcls -> SmplDcls . IsGlob PrimType StaticArrs ID ";"    (rule 31)
SmplDcls -> SmplDcls . IsGlob PrimType ID ";"       (rule 32)

ID              reduce using rule 2
INTDEC          reduce using rule 43
BOOLDEC         reduce using rule 43
CHARDEC         reduce using rule 43
VOIDDEC         reduce using rule 43
FLOATDEC        reduce using rule 43
GLOBAL          shift, and enter state 9
IF              reduce using rule 2
END             reduce using rule 2
WHILE           reduce using rule 2
FOR             reduce using rule 2
BEGIN           reduce using rule 2
BREAK           reduce using rule 2
CONTINUE        reduce using rule 2
RETURN          reduce using rule 2
EXIT            reduce using rule 2
READ            reduce using rule 2
WRITE           reduce using rule 2
PRINT           reduce using rule 2
FREE            reduce using rule 2

Ins             goto state 175
IsGlob          goto state 87
```

State 112

```
Ins -> Ins FOR ID . "=" INT "|" INT "|" INT ":" SmplDcls Ins END    (rule 18)
Ins -> Ins FOR ID . "=" INT "|" INT ":" SmplDcls Ins END    (rule 19)
Ins -> Ins FOR ID . "=" ENUM "|" ENUM ":" SmplDcls Ins END    (rule 20)

"="             shift, and enter state 174
```

State 113

```
Ins -> Ins WHILE Exp . ":" SmplDcls Ins END        (rule 17)
Exp -> Exp . "+" Exp                               (rule 71)
Exp -> Exp . "-" Exp                               (rule 72)
Exp -> Exp . "^" Exp                               (rule 73)
Exp -> Exp . "*" Exp                               (rule 74)
Exp -> Exp . "/" Exp                               (rule 75)
Exp -> Exp . "//" Exp                              (rule 76)
Exp -> Exp . "%" Exp                               (rule 77)
Exp -> Exp . OR Exp                                (rule 79)
Exp -> Exp . "||" Exp                              (rule 80)
Exp -> Exp . AND Exp                               (rule 81)
Exp -> Exp . "&&" Exp                              (rule 82)
Exp -> Exp . "<" Exp                               (rule 84)
Exp -> Exp . "<=" Exp                              (rule 85)
Exp -> Exp . ">" Exp                               (rule 86)
Exp -> Exp . ">=" Exp                              (rule 87)
Exp -> Exp . "==" Exp                              (rule 88)
Exp -> Exp . "!=" Exp                              (rule 89)
Exp -> Exp . "!!" Exp                              (rule 90)
Exp -> Exp . "." Exp                               (rule 91)

":"            shift, and enter state 154
"."            shift, and enter state 155
"!!"           shift, and enter state 156
"!="           shift, and enter state 157
"&&"           shift, and enter state 158
"||"           shift, and enter state 159
AND            shift, and enter state 160
OR             shift, and enter state 161
">="           shift, and enter state 162
"<="           shift, and enter state 163
">"            shift, and enter state 164
"<"            shift, and enter state 165
"/"            shift, and enter state 166
"//"           shift, and enter state 167
"+"            shift, and enter state 168
"-"            shift, and enter state 169
"^"            shift, and enter state 170
"*"            shift, and enter state 171
"%"            shift, and enter state 172
"=="           shift, and enter state 173
```

State 114

```
Exp -> Term .                                          (rule 96)

"]"             reduce using rule 96
")"             reduce using rule 96
":"             reduce using rule 96
";"             reduce using rule 96
","             reduce using rule 96
"."             reduce using rule 96
"!!"            reduce using rule 96
"!="            reduce using rule 96
"&&"            reduce using rule 96
"||"            reduce using rule 96
AND             reduce using rule 96
OR              reduce using rule 96
">="            reduce using rule 96
"<="            reduce using rule 96
">"             reduce using rule 96
"<"             reduce using rule 96
"/"             reduce using rule 96
"//"            reduce using rule 96
"+"             reduce using rule 96
"-"             reduce using rule 96
"^"             reduce using rule 96
"*"             reduce using rule 96
"%"             reduce using rule 96
"=="            reduce using rule 96
```

State 115

```
Exp -> ID . "[" Exp "]"                                (rule 92)
Exp -> ID . "(" Exp ")"                                (rule 93)
Term -> ID .                                           (rule 103)

"["             shift, and enter state 152
"]"             reduce using rule 103
"("             shift, and enter state 153
")"             reduce using rule 103
":"             reduce using rule 103
";"             reduce using rule 103
","             reduce using rule 103
"."             reduce using rule 103
"!!"            reduce using rule 103
"!="            reduce using rule 103
"&&"            reduce using rule 103
"||"            reduce using rule 103
```

```
AND             reduce using rule 103
OR              reduce using rule 103
">="            reduce using rule 103
"<="            reduce using rule 103
">"             reduce using rule 103
"<"             reduce using rule 103
"/"             reduce using rule 103
"//"            reduce using rule 103
"+"             reduce using rule 103
"-"             reduce using rule 103
"^"             reduce using rule 103
"*"             reduce using rule 103
"%"             reduce using rule 103
"=="            reduce using rule 103
```

State 116

```
Term -> DATAID .                                        (rule 104)

"]"             reduce using rule 104
")"             reduce using rule 104
":"             reduce using rule 104
";"             reduce using rule 104
","             reduce using rule 104
"."             reduce using rule 104
"!!"            reduce using rule 104
"!="            reduce using rule 104
"&&"            reduce using rule 104
"||"            reduce using rule 104
AND             reduce using rule 104
OR              reduce using rule 104
">="            reduce using rule 104
"<="            reduce using rule 104
">"             reduce using rule 104
"<"             reduce using rule 104
"/"             reduce using rule 104
"//"            reduce using rule 104
"+"             reduce using rule 104
"-"             reduce using rule 104
"^"             reduce using rule 104
"*"             reduce using rule 104
"%"             reduce using rule 104
"=="            reduce using rule 104
```

State 117

```
Exp -> "(" . Exp ")"                                    (rule 95)

ID              shift, and enter state 115
DATAID          shift, and enter state 116
"("             shift, and enter state 117
"!"             shift, and enter state 118
"-"             shift, and enter state 119
"*"             shift, and enter state 120
MALLOC          shift, and enter state 121
SIZEOF          shift, and enter state 122
GET             shift, and enter state 123
TRUE            shift, and enter state 124
FALSE           shift, and enter state 125
CHAR            shift, and enter state 126
INT             shift, and enter state 127
FLOAT           shift, and enter state 128

Exp             goto state 151
Term            goto state 114
```

State 118

```
Exp -> "!" . Exp                                        (rule 83)

ID              shift, and enter state 115
DATAID          shift, and enter state 116
"("             shift, and enter state 117
"!"             shift, and enter state 118
"-"             shift, and enter state 119
"*"             shift, and enter state 120
MALLOC          shift, and enter state 121
SIZEOF          shift, and enter state 122
GET             shift, and enter state 123
TRUE            shift, and enter state 124
FALSE           shift, and enter state 125
CHAR            shift, and enter state 126
INT             shift, and enter state 127
FLOAT           shift, and enter state 128

Exp             goto state 150
Term            goto state 114
```

State 119

```
Exp -> "-" . Exp                                        (rule 78)
```

```
ID              shift, and enter state 115
DATAID          shift, and enter state 116
"("             shift, and enter state 117
"!"             shift, and enter state 118
"-"             shift, and enter state 119
"*"             shift, and enter state 120
MALLOC          shift, and enter state 121
SIZEOF          shift, and enter state 122
GET             shift, and enter state 123
TRUE            shift, and enter state 124
FALSE           shift, and enter state 125
CHAR            shift, and enter state 126
INT             shift, and enter state 127
FLOAT           shift, and enter state 128

Exp             goto state 149
Term            goto state 114
```

State 120

```
Exp -> "*" . Exp                                    (rule 94)

ID              shift, and enter state 115
DATAID          shift, and enter state 116
"("             shift, and enter state 117
"!"             shift, and enter state 118
"-"             shift, and enter state 119
"*"             shift, and enter state 120
MALLOC          shift, and enter state 121
SIZEOF          shift, and enter state 122
GET             shift, and enter state 123
TRUE            shift, and enter state 124
FALSE           shift, and enter state 125
CHAR            shift, and enter state 126
INT             shift, and enter state 127
FLOAT           shift, and enter state 128

Exp             goto state 148
Term            goto state 114
```

State 121

```
Exp -> MALLOC . "(" Exp ")"                         (rule 97)

"("             shift, and enter state 147
```

State 122

```
Exp -> SIZEOF . "(" Exp ")"                          (rule 98)
Exp -> SIZEOF . "(" PrimType ")"                     (rule 99)

"("            shift, and enter state 146
```

State 123

```
Exp -> GET . "(" ENUM ")"                            (rule 100)

"("            shift, and enter state 145
```

State 124

```
Term -> TRUE .                                       (rule 101)

"]"            reduce using rule 101
")"            reduce using rule 101
":"            reduce using rule 101
";"            reduce using rule 101
","            reduce using rule 101
"."            reduce using rule 101
"!!"           reduce using rule 101
"!="           reduce using rule 101
"&&"           reduce using rule 101
"||"           reduce using rule 101
AND            reduce using rule 101
OR             reduce using rule 101
">="           reduce using rule 101
"<="           reduce using rule 101
">"            reduce using rule 101
"<"            reduce using rule 101
"/"            reduce using rule 101
"//"           reduce using rule 101
"+"            reduce using rule 101
"-"            reduce using rule 101
"^"            reduce using rule 101
"*"            reduce using rule 101
"%"            reduce using rule 101
"=="           reduce using rule 101
```

State 125

```
Term -> FALSE .                                          (rule 102)

"]"             reduce using rule 102
")"             reduce using rule 102
":"             reduce using rule 102
";"             reduce using rule 102
","             reduce using rule 102
"."             reduce using rule 102
"!!"            reduce using rule 102
"!="            reduce using rule 102
"&&"            reduce using rule 102
"||"            reduce using rule 102
AND             reduce using rule 102
OR              reduce using rule 102
">="            reduce using rule 102
"<="            reduce using rule 102
">"             reduce using rule 102
"<"             reduce using rule 102
"/"             reduce using rule 102
"//"            reduce using rule 102
"+"             reduce using rule 102
"-"             reduce using rule 102
"^"             reduce using rule 102
"*"             reduce using rule 102
"%"             reduce using rule 102
"=="            reduce using rule 102
```

State 126

```
Term -> CHAR .                                           (rule 107)

"]"             reduce using rule 107
")"             reduce using rule 107
":"             reduce using rule 107
";"             reduce using rule 107
","             reduce using rule 107
"."             reduce using rule 107
"!!"            reduce using rule 107
"!="            reduce using rule 107
"&&"            reduce using rule 107
"||"            reduce using rule 107
AND             reduce using rule 107
OR              reduce using rule 107
">="            reduce using rule 107
"<="            reduce using rule 107
```

```
">"             reduce using rule 107
"<"             reduce using rule 107
"/"             reduce using rule 107
"//"            reduce using rule 107
"+"             reduce using rule 107
"-"             reduce using rule 107
"^"             reduce using rule 107
"*"             reduce using rule 107
"%"             reduce using rule 107
"=="            reduce using rule 107
```

State 127

```
Term -> INT .                                           (rule 106)

"]"             reduce using rule 106
")"             reduce using rule 106
":"             reduce using rule 106
";"             reduce using rule 106
","             reduce using rule 106
"."             reduce using rule 106
"!!"            reduce using rule 106
"!="            reduce using rule 106
"&&"            reduce using rule 106
"||"            reduce using rule 106
AND             reduce using rule 106
OR              reduce using rule 106
">="            reduce using rule 106
"<="            reduce using rule 106
">"             reduce using rule 106
"<"             reduce using rule 106
"/"             reduce using rule 106
"//"            reduce using rule 106
"+"             reduce using rule 106
"-"             reduce using rule 106
"^"             reduce using rule 106
"*"             reduce using rule 106
"%"             reduce using rule 106
"=="            reduce using rule 106
```

State 128

```
Term -> FLOAT .                                         (rule 105)

"]"             reduce using rule 105
```

```
")"             reduce using rule 105
":"             reduce using rule 105
";"             reduce using rule 105
","             reduce using rule 105
"."             reduce using rule 105
"!!"            reduce using rule 105
"!="            reduce using rule 105
"&&"            reduce using rule 105
"||"            reduce using rule 105
AND             reduce using rule 105
OR              reduce using rule 105
">="            reduce using rule 105
"<="            reduce using rule 105
">"             reduce using rule 105
"<"             reduce using rule 105
"/"             reduce using rule 105
"//"            reduce using rule 105
"+"             reduce using rule 105
"-"             reduce using rule 105
"^"             reduce using rule 105
"*"             reduce using rule 105
"%"             reduce using rule 105
"=="            reduce using rule 105
```

State 129

```
Ins -> Ins IF ":" . SmplDcls Ins NextIf Else END    (rule 16)

ID              reduce using rule 28
INTDEC          reduce using rule 28
BOOLDEC         reduce using rule 28
CHARDEC         reduce using rule 28
VOIDDEC         reduce using rule 28
FLOATDEC        reduce using rule 28
GLOBAL          reduce using rule 28
IF              reduce using rule 28
ELIF            reduce using rule 28
ELSE            reduce using rule 28
END             reduce using rule 28
WHILE           reduce using rule 28
FOR             reduce using rule 28
BEGIN           reduce using rule 28
BREAK           reduce using rule 28
CONTINUE        reduce using rule 28
RETURN          reduce using rule 28
```

```
EXIT            reduce using rule 28
READ            reduce using rule 28
WRITE           reduce using rule 28
PRINT           reduce using rule 28
FREE            reduce using rule 28

SmplDcls        goto state 144
```

State 130

```
Ins -> Ins ID "*=" . Exp ";"                          (rule 7)

ID              shift, and enter state 115
DATAID          shift, and enter state 116
"("             shift, and enter state 117
"!"             shift, and enter state 118
"-"             shift, and enter state 119
"*"             shift, and enter state 120
MALLOC          shift, and enter state 121
SIZEOF          shift, and enter state 122
GET             shift, and enter state 123
TRUE            shift, and enter state 124
FALSE           shift, and enter state 125
CHAR            shift, and enter state 126
INT             shift, and enter state 127
FLOAT           shift, and enter state 128

Exp             goto state 143
Term            goto state 114
```

State 131

```
Ins -> Ins ID "+=" . Exp ";"                          (rule 8)

ID              shift, and enter state 115
DATAID          shift, and enter state 116
"("             shift, and enter state 117
"!"             shift, and enter state 118
"-"             shift, and enter state 119
"*"             shift, and enter state 120
MALLOC          shift, and enter state 121
SIZEOF          shift, and enter state 122
GET             shift, and enter state 123
TRUE            shift, and enter state 124
FALSE           shift, and enter state 125
```

```
CHAR            shift, and enter state 126
INT             shift, and enter state 127
FLOAT           shift, and enter state 128

Exp             goto state 142
Term            goto state 114
```

State 132

```
Ins -> Ins ID "=" . Exp ";"                          (rule 6)

ID              shift, and enter state 115
DATAID          shift, and enter state 116
"("             shift, and enter state 117
"!"             shift, and enter state 118
"-"             shift, and enter state 119
"*"             shift, and enter state 120
MALLOC          shift, and enter state 121
SIZEOF          shift, and enter state 122
GET             shift, and enter state 123
TRUE            shift, and enter state 124
FALSE           shift, and enter state 125
CHAR            shift, and enter state 126
INT             shift, and enter state 127
FLOAT           shift, and enter state 128

Exp             goto state 141
Term            goto state 114
```

State 133

```
SmplDcls -> SmplDcls IsGlob PrimType Ptrs . ID ";"    (rule 29)
Ptrs -> Ptrs . "*"                                   (rule 66)

ID              shift, and enter state 140
"*"             shift, and enter state 48
```

State 134

```
SmplDcls -> SmplDcls IsGlob PrimType EmptyArrs . ID ";"    (rule 30)
EmptyArrs -> EmptyArrs . "[" "]"                     (rule 68)

ID              shift, and enter state 139
"["             shift, and enter state 46
```

State 135

```
SmplDcls -> SmplDcls IsGlob PrimType StaticArrs . ID ";"    (rule 31)
StaticArrs -> StaticArrs . "[" INT "]"              (rule 70)

ID              shift, and enter state 138
"["             shift, and enter state 44
```

State 136

```
SmplDcls -> SmplDcls IsGlob PrimType ID . ";"       (rule 32)

";"             shift, and enter state 137
```

State 137

```
SmplDcls -> SmplDcls IsGlob PrimType ID ";" .       (rule 32)

ID              reduce using rule 32
INTDEC          reduce using rule 32
BOOLDEC         reduce using rule 32
CHARDEC         reduce using rule 32
VOIDDEC         reduce using rule 32
FLOATDEC        reduce using rule 32
GLOBAL          reduce using rule 32
IF              reduce using rule 32
ELIF            reduce using rule 32
ELSE            reduce using rule 32
END             reduce using rule 32
WHILE           reduce using rule 32
FOR             reduce using rule 32
BEGIN           reduce using rule 32
BREAK           reduce using rule 32
CONTINUE        reduce using rule 32
RETURN          reduce using rule 32
EXIT            reduce using rule 32
READ            reduce using rule 32
WRITE           reduce using rule 32
PRINT           reduce using rule 32
FREE            reduce using rule 32
```

State 138

```
SmplDcls -> SmplDcls IsGlob PrimType StaticArrs ID . ";"    (rule 31)

";"             shift, and enter state 224
```

State 139

```
SmplDcls -> SmplDcls IsGlob PrimType EmptyArrs ID . ";"    (rule 30)

";"            shift, and enter state 223
```

State 140

```
SmplDcls -> SmplDcls IsGlob PrimType Ptrs ID . ";"    (rule 29)

";"            shift, and enter state 222
```

State 141

```
Ins -> Ins ID "=" Exp . ";"                          (rule 6)
Exp -> Exp . "+" Exp                                 (rule 71)
Exp -> Exp . "-" Exp                                 (rule 72)
Exp -> Exp . "^" Exp                                 (rule 73)
Exp -> Exp . "*" Exp                                 (rule 74)
Exp -> Exp . "/" Exp                                 (rule 75)
Exp -> Exp . "//" Exp                                (rule 76)
Exp -> Exp . "%" Exp                                 (rule 77)
Exp -> Exp . OR Exp                                  (rule 79)
Exp -> Exp . "||" Exp                                (rule 80)
Exp -> Exp . AND Exp                                 (rule 81)
Exp -> Exp . "&&" Exp                                (rule 82)
Exp -> Exp . "<" Exp                                 (rule 84)
Exp -> Exp . "<=" Exp                                (rule 85)
Exp -> Exp . ">" Exp                                 (rule 86)
Exp -> Exp . ">=" Exp                                (rule 87)
Exp -> Exp . "==" Exp                                (rule 88)
Exp -> Exp . "!=" Exp                                (rule 89)
Exp -> Exp . "!!" Exp                                (rule 90)
Exp -> Exp . "." Exp                                 (rule 91)

";"            shift, and enter state 221
"."            shift, and enter state 155
"!!"           shift, and enter state 156
"!="           shift, and enter state 157
"&&"           shift, and enter state 158
"||"           shift, and enter state 159
AND            shift, and enter state 160
OR             shift, and enter state 161
">="           shift, and enter state 162
```

```
"<="            shift, and enter state 163
">"             shift, and enter state 164
"<"             shift, and enter state 165
"/"             shift, and enter state 166
"//"            shift, and enter state 167
"+"             shift, and enter state 168
"-"             shift, and enter state 169
"^"             shift, and enter state 170
"*"             shift, and enter state 171
"%"             shift, and enter state 172
"=="            shift, and enter state 173
```

State 142

```
Ins -> Ins ID "+=" Exp . ";"                        (rule 8)
Exp -> Exp . "+" Exp                                (rule 71)
Exp -> Exp . "-" Exp                                (rule 72)
Exp -> Exp . "^" Exp                                (rule 73)
Exp -> Exp . "*" Exp                                (rule 74)
Exp -> Exp . "/" Exp                                (rule 75)
Exp -> Exp . "//" Exp                               (rule 76)
Exp -> Exp . "%" Exp                                (rule 77)
Exp -> Exp . OR Exp                                 (rule 79)
Exp -> Exp . "||" Exp                               (rule 80)
Exp -> Exp . AND Exp                                (rule 81)
Exp -> Exp . "&&" Exp                               (rule 82)
Exp -> Exp . "<" Exp                                (rule 84)
Exp -> Exp . "<=" Exp                               (rule 85)
Exp -> Exp . ">" Exp                                (rule 86)
Exp -> Exp . ">=" Exp                               (rule 87)
Exp -> Exp . "==" Exp                               (rule 88)
Exp -> Exp . "!=" Exp                               (rule 89)
Exp -> Exp . "!!" Exp                               (rule 90)
Exp -> Exp . "." Exp                                (rule 91)

";"             shift, and enter state 220
"."             shift, and enter state 155
"!!"            shift, and enter state 156
"!="            shift, and enter state 157
"&&"            shift, and enter state 158
"||"            shift, and enter state 159
AND             shift, and enter state 160
OR              shift, and enter state 161
">="            shift, and enter state 162
"<="            shift, and enter state 163
```

```
">"             shift, and enter state 164
"<"             shift, and enter state 165
"/"             shift, and enter state 166
"//"            shift, and enter state 167
"+"             shift, and enter state 168
"-"             shift, and enter state 169
"^"             shift, and enter state 170
"*"             shift, and enter state 171
"%"             shift, and enter state 172
"=="            shift, and enter state 173
```

State 143

```
Ins -> Ins ID "*=" Exp . ";"                        (rule 7)
Exp -> Exp . "+" Exp                                (rule 71)
Exp -> Exp . "-" Exp                                (rule 72)
Exp -> Exp . "^" Exp                                (rule 73)
Exp -> Exp . "*" Exp                                (rule 74)
Exp -> Exp . "/" Exp                                (rule 75)
Exp -> Exp . "//" Exp                               (rule 76)
Exp -> Exp . "%" Exp                                (rule 77)
Exp -> Exp . OR Exp                                 (rule 79)
Exp -> Exp . "||" Exp                               (rule 80)
Exp -> Exp . AND Exp                                (rule 81)
Exp -> Exp . "&&" Exp                               (rule 82)
Exp -> Exp . "<" Exp                                (rule 84)
Exp -> Exp . "<=" Exp                               (rule 85)
Exp -> Exp . ">" Exp                                (rule 86)
Exp -> Exp . ">=" Exp                               (rule 87)
Exp -> Exp . "==" Exp                               (rule 88)
Exp -> Exp . "!=" Exp                               (rule 89)
Exp -> Exp . "!!" Exp                               (rule 90)
Exp -> Exp . "." Exp                                (rule 91)

";"             shift, and enter state 219
"."             shift, and enter state 155
"!!"            shift, and enter state 156
"!="            shift, and enter state 157
"&&"            shift, and enter state 158
"||"            shift, and enter state 159
AND             shift, and enter state 160
OR              shift, and enter state 161
">="            shift, and enter state 162
"<="            shift, and enter state 163
">"             shift, and enter state 164
```

```
"<"             shift, and enter state 165
"/"             shift, and enter state 166
"//"            shift, and enter state 167
"+"             shift, and enter state 168
"-"             shift, and enter state 169
"^"             shift, and enter state 170
"*"             shift, and enter state 171
"%"             shift, and enter state 172
"=="            shift, and enter state 173
```

State 144

```
Ins -> Ins IF ":" SmplDcls . Ins NextIf Else END    (rule 16)
SmplDcls -> SmplDcls . IsGlob PrimType Ptrs ID ";"    (rule 29)
SmplDcls -> SmplDcls . IsGlob PrimType EmptyArrs ID ";"    (rule 30)
SmplDcls -> SmplDcls . IsGlob PrimType StaticArrs ID ";"    (rule 31)
SmplDcls -> SmplDcls . IsGlob PrimType ID ";"       (rule 32)

ID              reduce using rule 2
INTDEC          reduce using rule 43
BOOLDEC         reduce using rule 43
CHARDEC         reduce using rule 43
VOIDDEC         reduce using rule 43
FLOATDEC        reduce using rule 43
GLOBAL          shift, and enter state 9
IF              reduce using rule 2
ELIF            reduce using rule 2
ELSE            reduce using rule 2
END             reduce using rule 2
WHILE           reduce using rule 2
FOR             reduce using rule 2
BEGIN           reduce using rule 2
BREAK           reduce using rule 2
CONTINUE        reduce using rule 2
RETURN          reduce using rule 2
EXIT            reduce using rule 2
READ            reduce using rule 2
WRITE           reduce using rule 2
PRINT           reduce using rule 2
FREE            reduce using rule 2

Ins             goto state 218
IsGlob          goto state 87
```

State 145

```
Exp -> GET "(" . ENUM ")"                              (rule 100)

ENUM            shift, and enter state 217
```

State 146

```
Exp -> SIZEOF "(" . Exp ")"                            (rule 98)
Exp -> SIZEOF "(" . PrimType ")"                       (rule 99)

ID              shift, and enter state 115
DATAID          shift, and enter state 116
INTDEC          shift, and enter state 12
BOOLDEC         shift, and enter state 13
CHARDEC         shift, and enter state 14
VOIDDEC         shift, and enter state 15
FLOATDEC        shift, and enter state 16
"("             shift, and enter state 117
"!"             shift, and enter state 118
"-"             shift, and enter state 119
"*"             shift, and enter state 120
MALLOC          shift, and enter state 121
SIZEOF          shift, and enter state 122
GET             shift, and enter state 123
TRUE            shift, and enter state 124
FALSE           shift, and enter state 125
CHAR            shift, and enter state 126
INT             shift, and enter state 127
FLOAT           shift, and enter state 128

PrimType        goto state 215
Exp             goto state 216
Term            goto state 114
```

State 147

```
Exp -> MALLOC "(" . Exp ")"                            (rule 97)

ID              shift, and enter state 115
DATAID          shift, and enter state 116
"("             shift, and enter state 117
"!"             shift, and enter state 118
"-"             shift, and enter state 119
"*"             shift, and enter state 120
MALLOC          shift, and enter state 121
SIZEOF          shift, and enter state 122
```

```
GET             shift, and enter state 123
TRUE            shift, and enter state 124
FALSE           shift, and enter state 125
CHAR            shift, and enter state 126
INT             shift, and enter state 127
FLOAT           shift, and enter state 128

Exp             goto state 214
Term            goto state 114
```

State 148

```
Exp -> Exp . "+" Exp                                    (rule 71)
Exp -> Exp . "-" Exp                                    (rule 72)
Exp -> Exp . "^" Exp                                    (rule 73)
Exp -> Exp . "*" Exp                                    (rule 74)
Exp -> Exp . "/" Exp                                    (rule 75)
Exp -> Exp . "//" Exp                                   (rule 76)
Exp -> Exp . "%" Exp                                    (rule 77)
Exp -> Exp . OR Exp                                     (rule 79)
Exp -> Exp . "||" Exp                                   (rule 80)
Exp -> Exp . AND Exp                                    (rule 81)
Exp -> Exp . "&&" Exp                                   (rule 82)
Exp -> Exp . "<" Exp                                    (rule 84)
Exp -> Exp . "<=" Exp                                   (rule 85)
Exp -> Exp . ">" Exp                                    (rule 86)
Exp -> Exp . ">=" Exp                                   (rule 87)
Exp -> Exp . "==" Exp                                   (rule 88)
Exp -> Exp . "!=" Exp                                   (rule 89)
Exp -> Exp . "!!" Exp                                   (rule 90)
Exp -> Exp . "." Exp                                    (rule 91)
Exp -> "*" Exp .                                        (rule 94)

"]"             reduce using rule 94
")"             reduce using rule 94
":"             reduce using rule 94
";"             reduce using rule 94
","             reduce using rule 94
"."             reduce using rule 94
"!!"            reduce using rule 94
"!="            reduce using rule 94
"&&"            reduce using rule 94
"||"            reduce using rule 94
AND             reduce using rule 94
OR              reduce using rule 94
```

```
">="           reduce using rule 94
"<="           reduce using rule 94
">"            reduce using rule 94
"<"            reduce using rule 94
"/"            reduce using rule 94
"//"           reduce using rule 94
"+"            reduce using rule 94
"-"            reduce using rule 94
"^"            reduce using rule 94
"*"            reduce using rule 94
"%"            reduce using rule 94
"=="           reduce using rule 94
```

State 149

```
Exp -> Exp . "+" Exp                                (rule 71)
Exp -> Exp . "-" Exp                                (rule 72)
Exp -> Exp . "^" Exp                                (rule 73)
Exp -> Exp . "*" Exp                                (rule 74)
Exp -> Exp . "/" Exp                                (rule 75)
Exp -> Exp . "//" Exp                               (rule 76)
Exp -> Exp . "%" Exp                                (rule 77)
Exp -> "-" Exp .                                    (rule 78)
Exp -> Exp . OR Exp                                 (rule 79)
Exp -> Exp . "||" Exp                               (rule 80)
Exp -> Exp . AND Exp                                (rule 81)
Exp -> Exp . "&&" Exp                               (rule 82)
Exp -> Exp . "<" Exp                                (rule 84)
Exp -> Exp . "<=" Exp                               (rule 85)
Exp -> Exp . ">" Exp                                (rule 86)
Exp -> Exp . ">=" Exp                               (rule 87)
Exp -> Exp . "==" Exp                               (rule 88)
Exp -> Exp . "!=" Exp                               (rule 89)
Exp -> Exp . "!!" Exp                               (rule 90)
Exp -> Exp . "." Exp                                (rule 91)

"]"            reduce using rule 78
")"            reduce using rule 78
":"            reduce using rule 78
";"            reduce using rule 78
","            reduce using rule 78
"."            shift, and enter state 155
"!!"           shift, and enter state 156
"!="           reduce using rule 78
"&&"           reduce using rule 78
```

```
"||"            reduce using rule 78
AND             reduce using rule 78
OR              reduce using rule 78
">="            reduce using rule 78
"<="            reduce using rule 78
">"             reduce using rule 78
"<"             reduce using rule 78
"/"             reduce using rule 78
"//"            reduce using rule 78
"+"             reduce using rule 78
"-"             reduce using rule 78
"^"             reduce using rule 78
"*"             reduce using rule 78
"%"             reduce using rule 78
"=="            reduce using rule 78
```

State 150

```
Exp -> Exp . "+" Exp                                (rule 71)
Exp -> Exp . "-" Exp                                (rule 72)
Exp -> Exp . "^" Exp                                (rule 73)
Exp -> Exp . "*" Exp                                (rule 74)
Exp -> Exp . "/" Exp                                (rule 75)
Exp -> Exp . "//" Exp                               (rule 76)
Exp -> Exp . "%" Exp                                (rule 77)
Exp -> Exp . OR Exp                                 (rule 79)
Exp -> Exp . "||" Exp                               (rule 80)
Exp -> Exp . AND Exp                                (rule 81)
Exp -> Exp . "&&" Exp                               (rule 82)
Exp -> "!" Exp .                                    (rule 83)
Exp -> Exp . "<" Exp                                (rule 84)
Exp -> Exp . "<=" Exp                               (rule 85)
Exp -> Exp . ">" Exp                                (rule 86)
Exp -> Exp . ">=" Exp                               (rule 87)
Exp -> Exp . "==" Exp                               (rule 88)
Exp -> Exp . "!=" Exp                               (rule 89)
Exp -> Exp . "!!" Exp                               (rule 90)
Exp -> Exp . "." Exp                                (rule 91)

"]"             reduce using rule 83
")"             reduce using rule 83
":"             reduce using rule 83
";"             reduce using rule 83
","             reduce using rule 83
"."             shift, and enter state 155
```

```
"!!"           shift, and enter state 156
"!="           reduce using rule 83
"&&"           reduce using rule 83
"||"           reduce using rule 83
AND            reduce using rule 83
OR             reduce using rule 83
">="           reduce using rule 83
"<="           reduce using rule 83
">"            reduce using rule 83
"<"            reduce using rule 83
"/"            shift, and enter state 166
"//"           shift, and enter state 167
"+"            shift, and enter state 168
"-"            shift, and enter state 169
"^"            shift, and enter state 170
"*"            shift, and enter state 171
"%"            shift, and enter state 172
"=="           reduce using rule 83
```

State 151

```
Exp -> Exp . "+" Exp                                (rule 71)
Exp -> Exp . "-" Exp                                (rule 72)
Exp -> Exp . "^" Exp                                (rule 73)
Exp -> Exp . "*" Exp                                (rule 74)
Exp -> Exp . "/" Exp                                (rule 75)
Exp -> Exp . "//" Exp                               (rule 76)
Exp -> Exp . "%" Exp                                (rule 77)
Exp -> Exp . OR Exp                                 (rule 79)
Exp -> Exp . "||" Exp                               (rule 80)
Exp -> Exp . AND Exp                                (rule 81)
Exp -> Exp . "&&" Exp                               (rule 82)
Exp -> Exp . "<" Exp                                (rule 84)
Exp -> Exp . "<=" Exp                               (rule 85)
Exp -> Exp . ">" Exp                                (rule 86)
Exp -> Exp . ">=" Exp                               (rule 87)
Exp -> Exp . "==" Exp                               (rule 88)
Exp -> Exp . "!=" Exp                               (rule 89)
Exp -> Exp . "!!" Exp                               (rule 90)
Exp -> Exp . "." Exp                                (rule 91)
Exp -> "(" Exp . ")"                                (rule 95)

")"            shift, and enter state 213
"."            shift, and enter state 155
"!!"           shift, and enter state 156
```

```
"!="            shift, and enter state 157
"&&"            shift, and enter state 158
"||"            shift, and enter state 159
AND             shift, and enter state 160
OR              shift, and enter state 161
">="            shift, and enter state 162
"<="            shift, and enter state 163
">"             shift, and enter state 164
"<"             shift, and enter state 165
"/"             shift, and enter state 166
"//"            shift, and enter state 167
"+"             shift, and enter state 168
"-"             shift, and enter state 169
"^"             shift, and enter state 170
"*"             shift, and enter state 171
"%"             shift, and enter state 172
"=="            shift, and enter state 173
```

State 152

```
Exp -> ID "[" . Exp "]"                                 (rule 92)

ID              shift, and enter state 115
DATAID          shift, and enter state 116
"("             shift, and enter state 117
"!"             shift, and enter state 118
"-"             shift, and enter state 119
"*"             shift, and enter state 120
MALLOC          shift, and enter state 121
SIZEOF          shift, and enter state 122
GET             shift, and enter state 123
TRUE            shift, and enter state 124
FALSE           shift, and enter state 125
CHAR            shift, and enter state 126
INT             shift, and enter state 127
FLOAT           shift, and enter state 128

Exp             goto state 212
Term            goto state 114
```

State 153

```
Exp -> ID "(" . Exp ")"                                 (rule 93)

ID              shift, and enter state 115
```

```
DATAID          shift, and enter state 116
"("             shift, and enter state 117
"!"             shift, and enter state 118
"-"             shift, and enter state 119
"*"             shift, and enter state 120
MALLOC          shift, and enter state 121
SIZEOF          shift, and enter state 122
GET             shift, and enter state 123
TRUE            shift, and enter state 124
FALSE           shift, and enter state 125
CHAR            shift, and enter state 126
INT             shift, and enter state 127
FLOAT           shift, and enter state 128

Exp             goto state 211
Term            goto state 114
```

State 154

```
Ins -> Ins WHILE Exp ":" . SmplDcls Ins END         (rule 17)

ID              reduce using rule 28
INTDEC          reduce using rule 28
BOOLDEC         reduce using rule 28
CHARDEC         reduce using rule 28
VOIDDEC         reduce using rule 28
FLOATDEC        reduce using rule 28
GLOBAL          reduce using rule 28
IF              reduce using rule 28
END             reduce using rule 28
WHILE           reduce using rule 28
FOR             reduce using rule 28
BEGIN           reduce using rule 28
BREAK           reduce using rule 28
CONTINUE        reduce using rule 28
RETURN          reduce using rule 28
EXIT            reduce using rule 28
READ            reduce using rule 28
WRITE           reduce using rule 28
PRINT           reduce using rule 28
FREE            reduce using rule 28

SmplDcls        goto state 210
```

State 155

```
Exp -> Exp "." . Exp                                    (rule 91)

ID              shift, and enter state 115
DATAID          shift, and enter state 116
"("             shift, and enter state 117
"!"             shift, and enter state 118
"-"             shift, and enter state 119
"*"             shift, and enter state 120
MALLOC          shift, and enter state 121
SIZEOF          shift, and enter state 122
GET             shift, and enter state 123
TRUE            shift, and enter state 124
FALSE           shift, and enter state 125
CHAR            shift, and enter state 126
INT             shift, and enter state 127
FLOAT           shift, and enter state 128

Exp             goto state 209
Term            goto state 114
```

State 156

```
Exp -> Exp "!!" . Exp                                   (rule 90)

ID              shift, and enter state 115
DATAID          shift, and enter state 116
"("             shift, and enter state 117
"!"             shift, and enter state 118
"-"             shift, and enter state 119
"*"             shift, and enter state 120
MALLOC          shift, and enter state 121
SIZEOF          shift, and enter state 122
GET             shift, and enter state 123
TRUE            shift, and enter state 124
FALSE           shift, and enter state 125
CHAR            shift, and enter state 126
INT             shift, and enter state 127
FLOAT           shift, and enter state 128

Exp             goto state 208
Term            goto state 114
```

State 157

```
Exp -> Exp "!=" . Exp                                   (rule 89)
```

```
ID              shift, and enter state 115
DATAID          shift, and enter state 116
"("             shift, and enter state 117
"!"             shift, and enter state 118
"-"             shift, and enter state 119
"*"             shift, and enter state 120
MALLOC          shift, and enter state 121
SIZEOF          shift, and enter state 122
GET             shift, and enter state 123
TRUE            shift, and enter state 124
FALSE           shift, and enter state 125
CHAR            shift, and enter state 126
INT             shift, and enter state 127
FLOAT           shift, and enter state 128

Exp             goto state 207
Term            goto state 114
```

State 158

```
Exp -> Exp "&&" . Exp                                   (rule 82)

ID              shift, and enter state 115
DATAID          shift, and enter state 116
"("             shift, and enter state 117
"!"             shift, and enter state 118
"-"             shift, and enter state 119
"*"             shift, and enter state 120
MALLOC          shift, and enter state 121
SIZEOF          shift, and enter state 122
GET             shift, and enter state 123
TRUE            shift, and enter state 124
FALSE           shift, and enter state 125
CHAR            shift, and enter state 126
INT             shift, and enter state 127
FLOAT           shift, and enter state 128

Exp             goto state 206
Term            goto state 114
```

State 159

```
Exp -> Exp "||" . Exp                                   (rule 80)
```

```
ID              shift, and enter state 115
DATAID          shift, and enter state 116
"("             shift, and enter state 117
"!"             shift, and enter state 118
"-"             shift, and enter state 119
"*"             shift, and enter state 120
MALLOC          shift, and enter state 121
SIZEOF          shift, and enter state 122
GET             shift, and enter state 123
TRUE            shift, and enter state 124
FALSE           shift, and enter state 125
CHAR            shift, and enter state 126
INT             shift, and enter state 127
FLOAT           shift, and enter state 128

Exp             goto state 205
Term            goto state 114
```

State 160

```
Exp -> Exp AND . Exp                                    (rule 81)

ID              shift, and enter state 115
DATAID          shift, and enter state 116
"("             shift, and enter state 117
"!"             shift, and enter state 118
"-"             shift, and enter state 119
"*"             shift, and enter state 120
MALLOC          shift, and enter state 121
SIZEOF          shift, and enter state 122
GET             shift, and enter state 123
TRUE            shift, and enter state 124
FALSE           shift, and enter state 125
CHAR            shift, and enter state 126
INT             shift, and enter state 127
FLOAT           shift, and enter state 128

Exp             goto state 204
Term            goto state 114
```

State 161

```
Exp -> Exp OR . Exp                                     (rule 79)

ID              shift, and enter state 115
```

```
DATAID          shift, and enter state 116
"("             shift, and enter state 117
"!"             shift, and enter state 118
"-"             shift, and enter state 119
"*"             shift, and enter state 120
MALLOC          shift, and enter state 121
SIZEOF          shift, and enter state 122
GET             shift, and enter state 123
TRUE            shift, and enter state 124
FALSE           shift, and enter state 125
CHAR            shift, and enter state 126
INT             shift, and enter state 127
FLOAT           shift, and enter state 128

Exp             goto state 203
Term            goto state 114
```

State 162

```
Exp -> Exp ">=" . Exp                                   (rule 87)

ID              shift, and enter state 115
DATAID          shift, and enter state 116
"("             shift, and enter state 117
"!"             shift, and enter state 118
"-"             shift, and enter state 119
"*"             shift, and enter state 120
MALLOC          shift, and enter state 121
SIZEOF          shift, and enter state 122
GET             shift, and enter state 123
TRUE            shift, and enter state 124
FALSE           shift, and enter state 125
CHAR            shift, and enter state 126
INT             shift, and enter state 127
FLOAT           shift, and enter state 128

Exp             goto state 202
Term            goto state 114
```

State 163

```
Exp -> Exp "<=" . Exp                                   (rule 85)

ID              shift, and enter state 115
DATAID          shift, and enter state 116
```

```
"("             shift, and enter state 117
"!"             shift, and enter state 118
"-"             shift, and enter state 119
"*"             shift, and enter state 120
MALLOC          shift, and enter state 121
SIZEOF          shift, and enter state 122
GET             shift, and enter state 123
TRUE            shift, and enter state 124
FALSE           shift, and enter state 125
CHAR            shift, and enter state 126
INT             shift, and enter state 127
FLOAT           shift, and enter state 128

Exp             goto state 201
Term            goto state 114
```

State 164

```
Exp -> Exp ">" . Exp                                    (rule 86)

ID              shift, and enter state 115
DATAID          shift, and enter state 116
"("             shift, and enter state 117
"!"             shift, and enter state 118
"-"             shift, and enter state 119
"*"             shift, and enter state 120
MALLOC          shift, and enter state 121
SIZEOF          shift, and enter state 122
GET             shift, and enter state 123
TRUE            shift, and enter state 124
FALSE           shift, and enter state 125
CHAR            shift, and enter state 126
INT             shift, and enter state 127
FLOAT           shift, and enter state 128

Exp             goto state 200
Term            goto state 114
```

State 165

```
Exp -> Exp "<" . Exp                                    (rule 84)

ID              shift, and enter state 115
DATAID          shift, and enter state 116
"("             shift, and enter state 117
```

```
"!"             shift, and enter state 118
"-"             shift, and enter state 119
"*"             shift, and enter state 120
MALLOC          shift, and enter state 121
SIZEOF          shift, and enter state 122
GET             shift, and enter state 123
TRUE            shift, and enter state 124
FALSE           shift, and enter state 125
CHAR            shift, and enter state 126
INT             shift, and enter state 127
FLOAT           shift, and enter state 128

Exp             goto state 199
Term            goto state 114
```

State 166

```
Exp -> Exp "/" . Exp                                (rule 75)

ID              shift, and enter state 115
DATAID          shift, and enter state 116
"("             shift, and enter state 117
"!"             shift, and enter state 118
"-"             shift, and enter state 119
"*"             shift, and enter state 120
MALLOC          shift, and enter state 121
SIZEOF          shift, and enter state 122
GET             shift, and enter state 123
TRUE            shift, and enter state 124
FALSE           shift, and enter state 125
CHAR            shift, and enter state 126
INT             shift, and enter state 127
FLOAT           shift, and enter state 128

Exp             goto state 198
Term            goto state 114
```

State 167

```
Exp -> Exp "//" . Exp                               (rule 76)

ID              shift, and enter state 115
DATAID          shift, and enter state 116
"("             shift, and enter state 117
"!"             shift, and enter state 118
```

```
"-"             shift, and enter state 119
"*"             shift, and enter state 120
MALLOC          shift, and enter state 121
SIZEOF          shift, and enter state 122
GET             shift, and enter state 123
TRUE            shift, and enter state 124
FALSE           shift, and enter state 125
CHAR            shift, and enter state 126
INT             shift, and enter state 127
FLOAT           shift, and enter state 128

Exp             goto state 197
Term            goto state 114
```

State 168

```
Exp -> Exp "+" . Exp                                (rule 71)

ID              shift, and enter state 115
DATAID          shift, and enter state 116
"("             shift, and enter state 117
"!"             shift, and enter state 118
"-"             shift, and enter state 119
"*"             shift, and enter state 120
MALLOC          shift, and enter state 121
SIZEOF          shift, and enter state 122
GET             shift, and enter state 123
TRUE            shift, and enter state 124
FALSE           shift, and enter state 125
CHAR            shift, and enter state 126
INT             shift, and enter state 127
FLOAT           shift, and enter state 128

Exp             goto state 196
Term            goto state 114
```

State 169

```
Exp -> Exp "-" . Exp                                (rule 72)

ID              shift, and enter state 115
DATAID          shift, and enter state 116
"("             shift, and enter state 117
"!"             shift, and enter state 118
"-"             shift, and enter state 119
```

```
"*"             shift, and enter state 120
MALLOC          shift, and enter state 121
SIZEOF          shift, and enter state 122
GET             shift, and enter state 123
TRUE            shift, and enter state 124
FALSE           shift, and enter state 125
CHAR            shift, and enter state 126
INT             shift, and enter state 127
FLOAT           shift, and enter state 128

Exp             goto state 195
Term            goto state 114
```

State 170

```
Exp -> Exp "^" . Exp                                (rule 73)

ID              shift, and enter state 115
DATAID          shift, and enter state 116
"("             shift, and enter state 117
"!"             shift, and enter state 118
"-"             shift, and enter state 119
"*"             shift, and enter state 120
MALLOC          shift, and enter state 121
SIZEOF          shift, and enter state 122
GET             shift, and enter state 123
TRUE            shift, and enter state 124
FALSE           shift, and enter state 125
CHAR            shift, and enter state 126
INT             shift, and enter state 127
FLOAT           shift, and enter state 128

Exp             goto state 194
Term            goto state 114
```

State 171

```
Exp -> Exp "*" . Exp                                (rule 74)

ID              shift, and enter state 115
DATAID          shift, and enter state 116
"("             shift, and enter state 117
"!"             shift, and enter state 118
"-"             shift, and enter state 119
"*"             shift, and enter state 120
```

```
MALLOC          shift, and enter state 121
SIZEOF          shift, and enter state 122
GET             shift, and enter state 123
TRUE            shift, and enter state 124
FALSE           shift, and enter state 125
CHAR            shift, and enter state 126
INT             shift, and enter state 127
FLOAT           shift, and enter state 128

Exp             goto state 193
Term            goto state 114
```

State 172

```
Exp -> Exp "%" . Exp                                    (rule 77)

ID              shift, and enter state 115
DATAID          shift, and enter state 116
"("             shift, and enter state 117
"!"             shift, and enter state 118
"-"             shift, and enter state 119
"*"             shift, and enter state 120
MALLOC          shift, and enter state 121
SIZEOF          shift, and enter state 122
GET             shift, and enter state 123
TRUE            shift, and enter state 124
FALSE           shift, and enter state 125
CHAR            shift, and enter state 126
INT             shift, and enter state 127
FLOAT           shift, and enter state 128

Exp             goto state 192
Term            goto state 114
```

State 173

```
Exp -> Exp "==" . Exp                                   (rule 88)

ID              shift, and enter state 115
DATAID          shift, and enter state 116
"("             shift, and enter state 117
"!"             shift, and enter state 118
"-"             shift, and enter state 119
"*"             shift, and enter state 120
MALLOC          shift, and enter state 121
```

```
SIZEOF          shift, and enter state 122
GET             shift, and enter state 123
TRUE            shift, and enter state 124
FALSE           shift, and enter state 125
CHAR            shift, and enter state 126
INT             shift, and enter state 127
FLOAT           shift, and enter state 128

Exp             goto state 191
Term            goto state 114
```

State 174

```
Ins -> Ins FOR ID "=" . INT "|" INT "|" INT ":" SmplDcls Ins END    (rule 18)
Ins -> Ins FOR ID "=" . INT "|" INT ":" SmplDcls Ins END    (rule 19)
Ins -> Ins FOR ID "=" . ENUM "|" ENUM ":" SmplDcls Ins END    (rule 20)

INT             shift, and enter state 189
ENUM            shift, and enter state 190
```

State 175

```
Ins -> Ins . PRINT "(" STRING PrntArgs ")" ";"      (rule 3)
Ins -> Ins . READ "(" ID ")" ";"                    (rule 4)
Ins -> Ins . WRITE "(" ID ")" ";"                   (rule 5)
Ins -> Ins . ID "=" Exp ";"                         (rule 6)
Ins -> Ins . ID "*=" Exp ";"                        (rule 7)
Ins -> Ins . ID "+=" Exp ";"                        (rule 8)
Ins -> Ins . BREAK ";"                              (rule 9)
Ins -> Ins . CONTINUE ";"                           (rule 10)
Ins -> Ins . RETURN ";"                             (rule 11)
Ins -> Ins . EXIT ";"                               (rule 12)
Ins -> Ins . FREE "(" ID ")" ";"                    (rule 13)
Ins -> Ins . FREE "(" DATAID ")" ";"                (rule 14)
Ins -> Ins . READ "(" DATAID ")" ";"                (rule 15)
Ins -> Ins . IF ":" SmplDcls Ins NextIf Else END    (rule 16)
Ins -> Ins . WHILE Exp ":" SmplDcls Ins END         (rule 17)
Ins -> Ins . FOR ID "=" INT "|" INT "|" INT ":" SmplDcls Ins END    (rule 18)
Ins -> Ins . FOR ID "=" INT "|" INT ":" SmplDcls Ins END    (rule 19)
Ins -> Ins . FOR ID "=" ENUM "|" ENUM ":" SmplDcls Ins END    (rule 20)
Ins -> Ins . BEGIN SmplDcls Ins END                 (rule 21)
Ins -> Ins BEGIN SmplDcls Ins . END                 (rule 21)

ID              shift, and enter state 89
IF              shift, and enter state 90
```

```
END             shift, and enter state 188
WHILE           shift, and enter state 92
FOR             shift, and enter state 93
BEGIN           shift, and enter state 94
BREAK           shift, and enter state 95
CONTINUE        shift, and enter state 96
RETURN          shift, and enter state 97
EXIT            shift, and enter state 98
READ            shift, and enter state 99
WRITE           shift, and enter state 100
PRINT           shift, and enter state 101
FREE            shift, and enter state 102
```

State 176

```
Ins -> Ins READ "(" ID . ")" ";"                    (rule 4)

")"             shift, and enter state 187
```

State 177

```
Ins -> Ins READ "(" DATAID . ")" ";"                (rule 15)

")"             shift, and enter state 186
```

State 178

```
Ins -> Ins WRITE "(" ID . ")" ";"                   (rule 5)

")"             shift, and enter state 185
```

State 179

```
Ins -> Ins PRINT "(" STRING . PrntArgs ")" ";"      (rule 3)

")"             reduce using rule 22
","             reduce using rule 22

PrntArgs        goto state 184
```

State 180

```
Ins -> Ins FREE "(" ID . ")" ";"                    (rule 13)

")"             shift, and enter state 183
```

State 181

```
Ins -> Ins FREE "(" DATAID . ")" ";"                (rule 14)

")"            shift, and enter state 182
```

State 182

```
Ins -> Ins FREE "(" DATAID ")" . ";"                (rule 14)

";"            shift, and enter state 241
```

State 183

```
Ins -> Ins FREE "(" ID ")" . ";"                    (rule 13)

";"            shift, and enter state 240
```

State 184

```
Ins -> Ins PRINT "(" STRING PrntArgs . ")" ";"      (rule 3)
PrntArgs -> PrntArgs . "," Exp                      (rule 23)

")"            shift, and enter state 238
","            shift, and enter state 239
```

State 185

```
Ins -> Ins WRITE "(" ID ")" . ";"                   (rule 5)

";"            shift, and enter state 237
```

State 186

```
Ins -> Ins READ "(" DATAID ")" . ";"                (rule 15)

";"            shift, and enter state 236
```

State 187

```
Ins -> Ins READ "(" ID ")" . ";"                    (rule 4)

";"            shift, and enter state 235
```

State 188

```
Ins -> Ins BEGIN SmplDcls Ins END .                (rule 21)

ID              reduce using rule 21
IF              reduce using rule 21
ELIF            reduce using rule 21
ELSE            reduce using rule 21
END             reduce using rule 21
WHILE           reduce using rule 21
FOR             reduce using rule 21
BEGIN           reduce using rule 21
BREAK           reduce using rule 21
CONTINUE        reduce using rule 21
RETURN          reduce using rule 21
EXIT            reduce using rule 21
READ            reduce using rule 21
WRITE           reduce using rule 21
PRINT           reduce using rule 21
FREE            reduce using rule 21
```

State 189

```
Ins -> Ins FOR ID "=" INT . "|" INT "|" INT ":" SmplDcls Ins END    (rule 18)
Ins -> Ins FOR ID "=" INT . "|" INT ":" SmplDcls Ins END    (rule 19)

"|"             shift, and enter state 234
```

State 190

```
Ins -> Ins FOR ID "=" ENUM . "|" ENUM ":" SmplDcls Ins END    (rule 20)

"|"             shift, and enter state 233
```

State 191

```
Exp -> Exp . "+" Exp                               (rule 71)
Exp -> Exp . "-" Exp                               (rule 72)
Exp -> Exp . "^" Exp                               (rule 73)
Exp -> Exp . "*" Exp                               (rule 74)
Exp -> Exp . "/" Exp                               (rule 75)
Exp -> Exp . "//" Exp                              (rule 76)
Exp -> Exp . "%" Exp                               (rule 77)
Exp -> Exp . OR Exp                                (rule 79)
```

```
Exp -> Exp . "||" Exp                                   (rule 80)
Exp -> Exp . AND Exp                                    (rule 81)
Exp -> Exp . "&&" Exp                                   (rule 82)
Exp -> Exp . "<" Exp                                    (rule 84)
Exp -> Exp . "<=" Exp                                   (rule 85)
Exp -> Exp . ">" Exp                                    (rule 86)
Exp -> Exp . ">=" Exp                                   (rule 87)
Exp -> Exp . "==" Exp                                   (rule 88)
Exp -> Exp "==" Exp .                                   (rule 88)
Exp -> Exp . "!=" Exp                                   (rule 89)
Exp -> Exp . "!!" Exp                                   (rule 90)
Exp -> Exp . "." Exp                                    (rule 91)

"]"             reduce using rule 88
")"             reduce using rule 88
":"             reduce using rule 88
";"             reduce using rule 88
","             reduce using rule 88
"."             shift, and enter state 155
"!!"            shift, and enter state 156
"!="            fail
"&&"            shift, and enter state 158
"||"            shift, and enter state 159
AND             shift, and enter state 160
OR              shift, and enter state 161
">="            shift, and enter state 162
"<="            shift, and enter state 163
">"             shift, and enter state 164
"<"             shift, and enter state 165
"/"             shift, and enter state 166
"//"            shift, and enter state 167
"+"             shift, and enter state 168
"-"             shift, and enter state 169
"^"             shift, and enter state 170
"*"             shift, and enter state 171
"%"             shift, and enter state 172
"=="            fail
```

State 192

```
Exp -> Exp . "+" Exp                                    (rule 71)
Exp -> Exp . "-" Exp                                    (rule 72)
Exp -> Exp . "^" Exp                                    (rule 73)
Exp -> Exp . "*" Exp                                    (rule 74)
Exp -> Exp . "/" Exp                                    (rule 75)
```

```
Exp -> Exp . "//" Exp                                   (rule 76)
Exp -> Exp . "%" Exp                                    (rule 77)
Exp -> Exp "%" Exp .                                    (rule 77)
Exp -> Exp . OR Exp                                     (rule 79)
Exp -> Exp . "||" Exp                                   (rule 80)
Exp -> Exp . AND Exp                                    (rule 81)
Exp -> Exp . "&&" Exp                                   (rule 82)
Exp -> Exp . "<" Exp                                    (rule 84)
Exp -> Exp . "<=" Exp                                   (rule 85)
Exp -> Exp . ">" Exp                                    (rule 86)
Exp -> Exp . ">=" Exp                                   (rule 87)
Exp -> Exp . "==" Exp                                   (rule 88)
Exp -> Exp . "!=" Exp                                   (rule 89)
Exp -> Exp . "!!" Exp                                   (rule 90)
Exp -> Exp . "." Exp                                    (rule 91)

"]"             reduce using rule 77
")"             reduce using rule 77
":"             reduce using rule 77
";"             reduce using rule 77
","             reduce using rule 77
"."             shift, and enter state 155
"!!"            shift, and enter state 156
"!="            reduce using rule 77
"&&"            reduce using rule 77
"||"            reduce using rule 77
AND             reduce using rule 77
OR              reduce using rule 77
">="            reduce using rule 77
"<="            reduce using rule 77
">"             reduce using rule 77
"<"             reduce using rule 77
"/"             reduce using rule 77
"//"            reduce using rule 77
"+"             reduce using rule 77
"-"             reduce using rule 77
"^"             shift, and enter state 170
"*"             reduce using rule 77
"%"             reduce using rule 77
"=="            reduce using rule 77
```

State 193

```
Exp -> Exp . "+" Exp                                    (rule 71)
Exp -> Exp . "-" Exp                                    (rule 72)
```

```
Exp -> Exp . "^" Exp                                    (rule 73)
Exp -> Exp . "*" Exp                                    (rule 74)
Exp -> Exp "*" Exp .                                    (rule 74)
Exp -> Exp . "/" Exp                                    (rule 75)
Exp -> Exp . "//" Exp                                   (rule 76)
Exp -> Exp . "%" Exp                                    (rule 77)
Exp -> Exp . OR Exp                                     (rule 79)
Exp -> Exp . "||" Exp                                   (rule 80)
Exp -> Exp . AND Exp                                    (rule 81)
Exp -> Exp . "&&" Exp                                   (rule 82)
Exp -> Exp . "<" Exp                                    (rule 84)
Exp -> Exp . "<=" Exp                                   (rule 85)
Exp -> Exp . ">" Exp                                    (rule 86)
Exp -> Exp . ">=" Exp                                   (rule 87)
Exp -> Exp . "==" Exp                                   (rule 88)
Exp -> Exp . "!=" Exp                                   (rule 89)
Exp -> Exp . "!!" Exp                                   (rule 90)
Exp -> Exp . "." Exp                                    (rule 91)

"]"             reduce using rule 74
")"             reduce using rule 74
":"             reduce using rule 74
";"             reduce using rule 74
","             reduce using rule 74
"."             shift, and enter state 155
"!!"            shift, and enter state 156
"!="            reduce using rule 74
"&&"            reduce using rule 74
"||"            reduce using rule 74
AND             reduce using rule 74
OR              reduce using rule 74
">="            reduce using rule 74
"<="            reduce using rule 74
">"             reduce using rule 74
"<"             reduce using rule 74
"/"             reduce using rule 74
"//"            reduce using rule 74
"+"             reduce using rule 74
"-"             reduce using rule 74
"^"             shift, and enter state 170
"*"             reduce using rule 74
"%"             reduce using rule 74
"=="            reduce using rule 74
```

State 194

```
Exp -> Exp . "+" Exp                                    (rule 71)
Exp -> Exp . "-" Exp                                    (rule 72)
Exp -> Exp . "^" Exp                                    (rule 73)
Exp -> Exp "^" Exp .                                    (rule 73)
Exp -> Exp . "*" Exp                                    (rule 74)
Exp -> Exp . "/" Exp                                    (rule 75)
Exp -> Exp . "//" Exp                                   (rule 76)
Exp -> Exp . "%" Exp                                    (rule 77)
Exp -> Exp . OR Exp                                     (rule 79)
Exp -> Exp . "||" Exp                                   (rule 80)
Exp -> Exp . AND Exp                                    (rule 81)
Exp -> Exp . "&&" Exp                                   (rule 82)
Exp -> Exp . "<" Exp                                    (rule 84)
Exp -> Exp . "<=" Exp                                   (rule 85)
Exp -> Exp . ">" Exp                                    (rule 86)
Exp -> Exp . ">=" Exp                                   (rule 87)
Exp -> Exp . "==" Exp                                   (rule 88)
Exp -> Exp . "!=" Exp                                   (rule 89)
Exp -> Exp . "!!" Exp                                   (rule 90)
Exp -> Exp . "." Exp                                    (rule 91)

"]"             reduce using rule 73
")"             reduce using rule 73
":"             reduce using rule 73
";"             reduce using rule 73
","             reduce using rule 73
"."             shift, and enter state 155
"!!"            shift, and enter state 156
"!="            reduce using rule 73
"&&"            reduce using rule 73
"||"            reduce using rule 73
AND             reduce using rule 73
OR              reduce using rule 73
">="            reduce using rule 73
"<="            reduce using rule 73
">"             reduce using rule 73
"<"             reduce using rule 73
"/"             reduce using rule 73
"//"            reduce using rule 73
"+"             reduce using rule 73
"-"             reduce using rule 73
"^"             reduce using rule 73
"*"             reduce using rule 73
"%"             reduce using rule 73
"=="            reduce using rule 73
```

State 195

```
Exp -> Exp . "+" Exp                                    (rule 71)
Exp -> Exp . "-" Exp                                    (rule 72)
Exp -> Exp "-" Exp .                                    (rule 72)
Exp -> Exp . "^" Exp                                    (rule 73)
Exp -> Exp . "*" Exp                                    (rule 74)
Exp -> Exp . "/" Exp                                    (rule 75)
Exp -> Exp . "//" Exp                                   (rule 76)
Exp -> Exp . "%" Exp                                    (rule 77)
Exp -> Exp . OR Exp                                     (rule 79)
Exp -> Exp . "||" Exp                                   (rule 80)
Exp -> Exp . AND Exp                                    (rule 81)
Exp -> Exp . "&&" Exp                                   (rule 82)
Exp -> Exp . "<" Exp                                    (rule 84)
Exp -> Exp . "<=" Exp                                   (rule 85)
Exp -> Exp . ">" Exp                                    (rule 86)
Exp -> Exp . ">=" Exp                                   (rule 87)
Exp -> Exp . "==" Exp                                   (rule 88)
Exp -> Exp . "!=" Exp                                   (rule 89)
Exp -> Exp . "!!" Exp                                   (rule 90)
Exp -> Exp . "." Exp                                    (rule 91)

"]"             reduce using rule 72
")"             reduce using rule 72
":"             reduce using rule 72
";"             reduce using rule 72
","             reduce using rule 72
"."             shift, and enter state 155
"!!"            shift, and enter state 156
"!="            reduce using rule 72
"&&"            reduce using rule 72
"||"            reduce using rule 72
AND             reduce using rule 72
OR              reduce using rule 72
">="            reduce using rule 72
"<="            reduce using rule 72
">"             reduce using rule 72
"<"             reduce using rule 72
"/"             shift, and enter state 166
"//"            shift, and enter state 167
"+"             reduce using rule 72
"-"             reduce using rule 72
"^"             shift, and enter state 170
"*"             shift, and enter state 171
"%"             shift, and enter state 172
```

```
"=="           reduce using rule 72
```

State 196

```
Exp -> Exp . "+" Exp                                  (rule 71)
Exp -> Exp "+" Exp .                                  (rule 71)
Exp -> Exp . "-" Exp                                  (rule 72)
Exp -> Exp . "^" Exp                                  (rule 73)
Exp -> Exp . "*" Exp                                  (rule 74)
Exp -> Exp . "/" Exp                                  (rule 75)
Exp -> Exp . "//" Exp                                 (rule 76)
Exp -> Exp . "%" Exp                                  (rule 77)
Exp -> Exp . OR Exp                                   (rule 79)
Exp -> Exp . "||" Exp                                 (rule 80)
Exp -> Exp . AND Exp                                  (rule 81)
Exp -> Exp . "&&" Exp                                 (rule 82)
Exp -> Exp . "<" Exp                                  (rule 84)
Exp -> Exp . "<=" Exp                                 (rule 85)
Exp -> Exp . ">" Exp                                  (rule 86)
Exp -> Exp . ">=" Exp                                 (rule 87)
Exp -> Exp . "==" Exp                                 (rule 88)
Exp -> Exp . "!=" Exp                                 (rule 89)
Exp -> Exp . "!!" Exp                                 (rule 90)
Exp -> Exp . "." Exp                                  (rule 91)

"]"            reduce using rule 71
")"            reduce using rule 71
":"            reduce using rule 71
";"            reduce using rule 71
","            reduce using rule 71
"."            shift, and enter state 155
"!!"           shift, and enter state 156
"!="           reduce using rule 71
"&&"           reduce using rule 71
"||"           reduce using rule 71
AND            reduce using rule 71
OR             reduce using rule 71
">="           reduce using rule 71
"<="           reduce using rule 71
">"            reduce using rule 71
"<"            reduce using rule 71
"/"            shift, and enter state 166
"//"           shift, and enter state 167
"+"            reduce using rule 71
"-"            reduce using rule 71
```

```
"^"            shift, and enter state 170
"*"            shift, and enter state 171
"%"            shift, and enter state 172
"=="           reduce using rule 71
```

State 197

```
Exp -> Exp . "+" Exp                                (rule 71)
Exp -> Exp . "-" Exp                                (rule 72)
Exp -> Exp . "^" Exp                                (rule 73)
Exp -> Exp . "*" Exp                                (rule 74)
Exp -> Exp . "/" Exp                                (rule 75)
Exp -> Exp . "//" Exp                               (rule 76)
Exp -> Exp "//" Exp .                               (rule 76)
Exp -> Exp . "%" Exp                                (rule 77)
Exp -> Exp . OR Exp                                 (rule 79)
Exp -> Exp . "||" Exp                               (rule 80)
Exp -> Exp . AND Exp                                (rule 81)
Exp -> Exp . "&&" Exp                               (rule 82)
Exp -> Exp . "<" Exp                                (rule 84)
Exp -> Exp . "<=" Exp                               (rule 85)
Exp -> Exp . ">" Exp                                (rule 86)
Exp -> Exp . ">=" Exp                               (rule 87)
Exp -> Exp . "==" Exp                               (rule 88)
Exp -> Exp . "!=" Exp                               (rule 89)
Exp -> Exp . "!!" Exp                               (rule 90)
Exp -> Exp . "." Exp                                (rule 91)
```

```
"]"            reduce using rule 76
")"            reduce using rule 76
":"            reduce using rule 76
";"            reduce using rule 76
","            reduce using rule 76
"."            shift, and enter state 155
"!!"           shift, and enter state 156
"!="           reduce using rule 76
"&&"           reduce using rule 76
"||"           reduce using rule 76
AND            reduce using rule 76
OR             reduce using rule 76
">="           reduce using rule 76
"<="           reduce using rule 76
">"            reduce using rule 76
"<"            reduce using rule 76
"/"            reduce using rule 76
```

```
"//"            reduce using rule 76
"+"             reduce using rule 76
"-"             reduce using rule 76
"^"             shift, and enter state 170
"*"             reduce using rule 76
"%"             reduce using rule 76
"=="            reduce using rule 76
```

State 198

```
Exp -> Exp . "+" Exp                                (rule 71)
Exp -> Exp . "-" Exp                                (rule 72)
Exp -> Exp . "^" Exp                                (rule 73)
Exp -> Exp . "*" Exp                                (rule 74)
Exp -> Exp . "/" Exp                                (rule 75)
Exp -> Exp "/" Exp .                                (rule 75)
Exp -> Exp . "//" Exp                               (rule 76)
Exp -> Exp . "%" Exp                                (rule 77)
Exp -> Exp . OR Exp                                 (rule 79)
Exp -> Exp . "||" Exp                               (rule 80)
Exp -> Exp . AND Exp                                (rule 81)
Exp -> Exp . "&&" Exp                               (rule 82)
Exp -> Exp . "<" Exp                                (rule 84)
Exp -> Exp . "<=" Exp                               (rule 85)
Exp -> Exp . ">" Exp                                (rule 86)
Exp -> Exp . ">=" Exp                               (rule 87)
Exp -> Exp . "==" Exp                               (rule 88)
Exp -> Exp . "!=" Exp                               (rule 89)
Exp -> Exp . "!!" Exp                               (rule 90)
Exp -> Exp . "." Exp                                (rule 91)

"]"             reduce using rule 75
")"             reduce using rule 75
":"             reduce using rule 75
";"             reduce using rule 75
","             reduce using rule 75
"."             shift, and enter state 155
"!!"            shift, and enter state 156
"!="            reduce using rule 75
"&&"            reduce using rule 75
"||"            reduce using rule 75
AND             reduce using rule 75
OR              reduce using rule 75
">="            reduce using rule 75
"<="            reduce using rule 75
```

```
">"            reduce using rule 75
"<"            reduce using rule 75
"/"            reduce using rule 75
"//"           reduce using rule 75
"+"            reduce using rule 75
"-"            reduce using rule 75
"^"            shift, and enter state 170
"*"            reduce using rule 75
"%"            reduce using rule 75
"=="           reduce using rule 75
```

State 199

```
Exp -> Exp . "+" Exp                                (rule 71)
Exp -> Exp . "-" Exp                                (rule 72)
Exp -> Exp . "^" Exp                                (rule 73)
Exp -> Exp . "*" Exp                                (rule 74)
Exp -> Exp . "/" Exp                                (rule 75)
Exp -> Exp . "//" Exp                               (rule 76)
Exp -> Exp . "%" Exp                                (rule 77)
Exp -> Exp . OR Exp                                 (rule 79)
Exp -> Exp . "||" Exp                               (rule 80)
Exp -> Exp . AND Exp                                (rule 81)
Exp -> Exp . "&&" Exp                               (rule 82)
Exp -> Exp . "<" Exp                                (rule 84)
Exp -> Exp "<" Exp .                                (rule 84)
Exp -> Exp . "<=" Exp                               (rule 85)
Exp -> Exp . ">" Exp                                (rule 86)
Exp -> Exp . ">=" Exp                               (rule 87)
Exp -> Exp . "==" Exp                               (rule 88)
Exp -> Exp . "!=" Exp                               (rule 89)
Exp -> Exp . "!!" Exp                               (rule 90)
Exp -> Exp . "." Exp                                (rule 91)
```

```
"]"            reduce using rule 84
")"            reduce using rule 84
":"            reduce using rule 84
";"            reduce using rule 84
","            reduce using rule 84
"."            shift, and enter state 155
"!!"           shift, and enter state 156
"!="           reduce using rule 84
"&&"           shift, and enter state 158
"||"           shift, and enter state 159
AND            shift, and enter state 160
```

```
OR              shift, and enter state 161
">="            fail
"<="            fail
">"             fail
"<"             fail
"/"             shift, and enter state 166
"//"            shift, and enter state 167
"+"             shift, and enter state 168
"-"             shift, and enter state 169
"^"             shift, and enter state 170
"*"             shift, and enter state 171
"%"             shift, and enter state 172
"=="            reduce using rule 84
```

State 200

```
Exp -> Exp . "+" Exp                                (rule 71)
Exp -> Exp . "-" Exp                                (rule 72)
Exp -> Exp . "^" Exp                                (rule 73)
Exp -> Exp . "*" Exp                                (rule 74)
Exp -> Exp . "/" Exp                                (rule 75)
Exp -> Exp . "//" Exp                               (rule 76)
Exp -> Exp . "%" Exp                                (rule 77)
Exp -> Exp . OR Exp                                 (rule 79)
Exp -> Exp . "||" Exp                               (rule 80)
Exp -> Exp . AND Exp                                (rule 81)
Exp -> Exp . "&&" Exp                               (rule 82)
Exp -> Exp . "<" Exp                                (rule 84)
Exp -> Exp . "<=" Exp                               (rule 85)
Exp -> Exp . ">" Exp                                (rule 86)
Exp -> Exp ">" Exp .                                (rule 86)
Exp -> Exp . ">=" Exp                               (rule 87)
Exp -> Exp . "==" Exp                               (rule 88)
Exp -> Exp . "!=" Exp                               (rule 89)
Exp -> Exp . "!!" Exp                               (rule 90)
Exp -> Exp . "." Exp                                (rule 91)

"]"             reduce using rule 86
")"             reduce using rule 86
":"             reduce using rule 86
";"             reduce using rule 86
","             reduce using rule 86
"."             shift, and enter state 155
"!!"            shift, and enter state 156
"!="            reduce using rule 86
```

```
"&&"            shift, and enter state 158
"||"            shift, and enter state 159
AND             shift, and enter state 160
OR              shift, and enter state 161
">="            fail
"<="            fail
">"             fail
"<"             fail
"/"             shift, and enter state 166
"//"            shift, and enter state 167
"+"             shift, and enter state 168
"-"             shift, and enter state 169
"^"             shift, and enter state 170
"*"             shift, and enter state 171
"%"             shift, and enter state 172
"=="            reduce using rule 86
```

State 201

```
Exp -> Exp . "+" Exp                                (rule 71)
Exp -> Exp . "-" Exp                                (rule 72)
Exp -> Exp . "^" Exp                                (rule 73)
Exp -> Exp . "*" Exp                                (rule 74)
Exp -> Exp . "/" Exp                                (rule 75)
Exp -> Exp . "//" Exp                               (rule 76)
Exp -> Exp . "%" Exp                                (rule 77)
Exp -> Exp . OR Exp                                 (rule 79)
Exp -> Exp . "||" Exp                               (rule 80)
Exp -> Exp . AND Exp                                (rule 81)
Exp -> Exp . "&&" Exp                               (rule 82)
Exp -> Exp . "<" Exp                                (rule 84)
Exp -> Exp . "<=" Exp                               (rule 85)
Exp -> Exp "<=" Exp .                               (rule 85)
Exp -> Exp . ">" Exp                                (rule 86)
Exp -> Exp . ">=" Exp                               (rule 87)
Exp -> Exp . "==" Exp                               (rule 88)
Exp -> Exp . "!=" Exp                               (rule 89)
Exp -> Exp . "!!" Exp                               (rule 90)
Exp -> Exp . "." Exp                                (rule 91)

"]"             reduce using rule 85
")"             reduce using rule 85
":"             reduce using rule 85
";"             reduce using rule 85
","             reduce using rule 85
```

```
"."             shift, and enter state 155
"!!"            shift, and enter state 156
"!="            reduce using rule 85
"&&"            shift, and enter state 158
"||"            shift, and enter state 159
AND             shift, and enter state 160
OR              shift, and enter state 161
">="            fail
"<="            fail
">"             fail
"<"             fail
"/"             shift, and enter state 166
"//"            shift, and enter state 167
"+"             shift, and enter state 168
"-"             shift, and enter state 169
"^"             shift, and enter state 170
"*"             shift, and enter state 171
"%"             shift, and enter state 172
"=="            reduce using rule 85
```

State 202

```
Exp -> Exp . "+" Exp                                (rule 71)
Exp -> Exp . "-" Exp                                (rule 72)
Exp -> Exp . "^" Exp                                (rule 73)
Exp -> Exp . "*" Exp                                (rule 74)
Exp -> Exp . "/" Exp                                (rule 75)
Exp -> Exp . "//" Exp                               (rule 76)
Exp -> Exp . "%" Exp                                (rule 77)
Exp -> Exp . OR Exp                                 (rule 79)
Exp -> Exp . "||" Exp                               (rule 80)
Exp -> Exp . AND Exp                                (rule 81)
Exp -> Exp . "&&" Exp                               (rule 82)
Exp -> Exp . "<" Exp                                (rule 84)
Exp -> Exp . "<=" Exp                               (rule 85)
Exp -> Exp . ">" Exp                                (rule 86)
Exp -> Exp . ">=" Exp                               (rule 87)
Exp -> Exp ">=" Exp .                               (rule 87)
Exp -> Exp . "==" Exp                               (rule 88)
Exp -> Exp . "!=" Exp                               (rule 89)
Exp -> Exp . "!!" Exp                               (rule 90)
Exp -> Exp . "." Exp                                (rule 91)

"]"             reduce using rule 87
")"             reduce using rule 87
```

```
":"             reduce using rule 87
";"             reduce using rule 87
","             reduce using rule 87
"."             shift, and enter state 155
"!!"            shift, and enter state 156
"!="            reduce using rule 87
"&&"            shift, and enter state 158
"||"            shift, and enter state 159
AND             shift, and enter state 160
OR              shift, and enter state 161
">="            fail
"<="            fail
">"             fail
"<"             fail
"/"             shift, and enter state 166
"//"            shift, and enter state 167
"+"             shift, and enter state 168
"-"             shift, and enter state 169
"^"             shift, and enter state 170
"*"             shift, and enter state 171
"%"             shift, and enter state 172
"=="            reduce using rule 87
```

State 203

```
Exp -> Exp . "+" Exp                                (rule 71)
Exp -> Exp . "-" Exp                                (rule 72)
Exp -> Exp . "^" Exp                                (rule 73)
Exp -> Exp . "*" Exp                                (rule 74)
Exp -> Exp . "/" Exp                                (rule 75)
Exp -> Exp . "//" Exp                               (rule 76)
Exp -> Exp . "%" Exp                                (rule 77)
Exp -> Exp . OR Exp                                 (rule 79)
Exp -> Exp OR Exp .                                 (rule 79)
Exp -> Exp . "||" Exp                               (rule 80)
Exp -> Exp . AND Exp                                (rule 81)
Exp -> Exp . "&&" Exp                               (rule 82)
Exp -> Exp . "<" Exp                                (rule 84)
Exp -> Exp . "<=" Exp                               (rule 85)
Exp -> Exp . ">" Exp                                (rule 86)
Exp -> Exp . ">=" Exp                               (rule 87)
Exp -> Exp . "==" Exp                               (rule 88)
Exp -> Exp . "!=" Exp                               (rule 89)
Exp -> Exp . "!!" Exp                               (rule 90)
Exp -> Exp . "." Exp                                (rule 91)
```

```
"]"             reduce using rule 79
")"             reduce using rule 79
":"             reduce using rule 79
";"             reduce using rule 79
","             reduce using rule 79
"."             shift, and enter state 155
"!!"            shift, and enter state 156
"!="            reduce using rule 79
"&&"            shift, and enter state 158
"||"            shift, and enter state 159
AND             shift, and enter state 160
OR              reduce using rule 79
">="            reduce using rule 79
"<="            reduce using rule 79
">"             reduce using rule 79
"<"             reduce using rule 79
"/"             shift, and enter state 166
"//"            shift, and enter state 167
"+"             shift, and enter state 168
"-"             shift, and enter state 169
"^"             shift, and enter state 170
"*"             shift, and enter state 171
"%"             shift, and enter state 172
"=="            reduce using rule 79
```

State 204

```
Exp -> Exp . "+" Exp                                (rule 71)
Exp -> Exp . "-" Exp                                (rule 72)
Exp -> Exp . "^" Exp                                (rule 73)
Exp -> Exp . "*" Exp                                (rule 74)
Exp -> Exp . "/" Exp                                (rule 75)
Exp -> Exp . "//" Exp                               (rule 76)
Exp -> Exp . "%" Exp                                (rule 77)
Exp -> Exp . OR Exp                                 (rule 79)
Exp -> Exp . "||" Exp                               (rule 80)
Exp -> Exp . AND Exp                                (rule 81)
Exp -> Exp AND Exp .                                (rule 81)
Exp -> Exp . "&&" Exp                               (rule 82)
Exp -> Exp . "<" Exp                                (rule 84)
Exp -> Exp . "<=" Exp                               (rule 85)
Exp -> Exp . ">" Exp                                (rule 86)
Exp -> Exp . ">=" Exp                               (rule 87)
Exp -> Exp . "==" Exp                               (rule 88)
```

```
Exp -> Exp . "!=" Exp                                   (rule 89)
Exp -> Exp . "!!" Exp                                   (rule 90)
Exp -> Exp . "." Exp                                    (rule 91)

"]"             reduce using rule 81
")"             reduce using rule 81
":"             reduce using rule 81
";"             reduce using rule 81
","             reduce using rule 81
"."             shift, and enter state 155
"!!"            shift, and enter state 156
"!="            reduce using rule 81
"&&"            shift, and enter state 158
"||"            shift, and enter state 159
AND             reduce using rule 81
OR              reduce using rule 81
">="            reduce using rule 81
"<="            reduce using rule 81
">"             reduce using rule 81
"<"             reduce using rule 81
"/"             shift, and enter state 166
"//"            shift, and enter state 167
"+"             shift, and enter state 168
"-"             shift, and enter state 169
"^"             shift, and enter state 170
"*"             shift, and enter state 171
"%"             shift, and enter state 172
"=="            reduce using rule 81
```

State 205

```
Exp -> Exp . "+" Exp                                    (rule 71)
Exp -> Exp . "-" Exp                                    (rule 72)
Exp -> Exp . "^" Exp                                    (rule 73)
Exp -> Exp . "*" Exp                                    (rule 74)
Exp -> Exp . "/" Exp                                    (rule 75)
Exp -> Exp . "//" Exp                                   (rule 76)
Exp -> Exp . "%" Exp                                    (rule 77)
Exp -> Exp . OR Exp                                     (rule 79)
Exp -> Exp . "||" Exp                                   (rule 80)
Exp -> Exp "||" Exp .                                   (rule 80)
Exp -> Exp . AND Exp                                    (rule 81)
Exp -> Exp . "&&" Exp                                   (rule 82)
Exp -> Exp . "<" Exp                                    (rule 84)
Exp -> Exp . "<=" Exp                                   (rule 85)
```

```
Exp -> Exp . ">" Exp                                    (rule 86)
Exp -> Exp . ">=" Exp                                   (rule 87)
Exp -> Exp . "==" Exp                                   (rule 88)
Exp -> Exp . "!=" Exp                                   (rule 89)
Exp -> Exp . "!!" Exp                                   (rule 90)
Exp -> Exp . "." Exp                                    (rule 91)

"]"             reduce using rule 80
")"             reduce using rule 80
":"             reduce using rule 80
";"             reduce using rule 80
","             reduce using rule 80
"."             shift, and enter state 155
"!!"            shift, and enter state 156
"!="            reduce using rule 80
"&&"            shift, and enter state 158
"||"            reduce using rule 80
AND             reduce using rule 80
OR              reduce using rule 80
">="            reduce using rule 80
"<="            reduce using rule 80
">"             reduce using rule 80
"<"             reduce using rule 80
"/"             shift, and enter state 166
"//"            shift, and enter state 167
"+"             shift, and enter state 168
"-"             shift, and enter state 169
"^"             shift, and enter state 170
"*"             shift, and enter state 171
"%"             shift, and enter state 172
"=="            reduce using rule 80
```

State 206

```
Exp -> Exp . "+" Exp                                    (rule 71)
Exp -> Exp . "-" Exp                                    (rule 72)
Exp -> Exp . "^" Exp                                    (rule 73)
Exp -> Exp . "*" Exp                                    (rule 74)
Exp -> Exp . "/" Exp                                    (rule 75)
Exp -> Exp . "//" Exp                                   (rule 76)
Exp -> Exp . "%" Exp                                    (rule 77)
Exp -> Exp . OR Exp                                     (rule 79)
Exp -> Exp . "||" Exp                                   (rule 80)
Exp -> Exp . AND Exp                                    (rule 81)
Exp -> Exp . "&&" Exp                                   (rule 82)
```

```
Exp -> Exp "&&" Exp .                                   (rule 82)
Exp -> Exp . "<" Exp                                    (rule 84)
Exp -> Exp . "<=" Exp                                   (rule 85)
Exp -> Exp . ">" Exp                                    (rule 86)
Exp -> Exp . ">=" Exp                                   (rule 87)
Exp -> Exp . "==" Exp                                   (rule 88)
Exp -> Exp . "!=" Exp                                   (rule 89)
Exp -> Exp . "!!" Exp                                   (rule 90)
Exp -> Exp . "." Exp                                    (rule 91)

"]"             reduce using rule 82
")"             reduce using rule 82
":"             reduce using rule 82
";"             reduce using rule 82
","             reduce using rule 82
"."             shift, and enter state 155
"!!"            shift, and enter state 156
"!="            reduce using rule 82
"&&"            reduce using rule 82
"||"            reduce using rule 82
AND             reduce using rule 82
OR              reduce using rule 82
">="            reduce using rule 82
"<="            reduce using rule 82
">"             reduce using rule 82
"<"             reduce using rule 82
"/"             shift, and enter state 166
"//"            shift, and enter state 167
"+"             shift, and enter state 168
"-"             shift, and enter state 169
"^"             shift, and enter state 170
"*"             shift, and enter state 171
"%"             shift, and enter state 172
"=="            reduce using rule 82
```

State 207

```
Exp -> Exp . "+" Exp                                    (rule 71)
Exp -> Exp . "-" Exp                                    (rule 72)
Exp -> Exp . "^" Exp                                    (rule 73)
Exp -> Exp . "*" Exp                                    (rule 74)
Exp -> Exp . "/" Exp                                    (rule 75)
Exp -> Exp . "//" Exp                                   (rule 76)
Exp -> Exp . "%" Exp                                    (rule 77)
Exp -> Exp . OR Exp                                     (rule 79)
```

```
Exp -> Exp . "||" Exp                                   (rule 80)
Exp -> Exp . AND Exp                                    (rule 81)
Exp -> Exp . "&&" Exp                                   (rule 82)
Exp -> Exp . "<" Exp                                    (rule 84)
Exp -> Exp . "<=" Exp                                   (rule 85)
Exp -> Exp . ">" Exp                                    (rule 86)
Exp -> Exp . ">=" Exp                                   (rule 87)
Exp -> Exp . "==" Exp                                   (rule 88)
Exp -> Exp . "!=" Exp                                   (rule 89)
Exp -> Exp "!=" Exp .                                   (rule 89)
Exp -> Exp . "!!" Exp                                   (rule 90)
Exp -> Exp . "." Exp                                    (rule 91)

"]"             reduce using rule 89
")"             reduce using rule 89
":"             reduce using rule 89
";"             reduce using rule 89
","             reduce using rule 89
"."             shift, and enter state 155
"!!"            shift, and enter state 156
"!="            fail
"&&"            shift, and enter state 158
"||"            shift, and enter state 159
AND             shift, and enter state 160
OR              shift, and enter state 161
">="            shift, and enter state 162
"<="            shift, and enter state 163
">"             shift, and enter state 164
"<"             shift, and enter state 165
"/"             shift, and enter state 166
"//"            shift, and enter state 167
"+"             shift, and enter state 168
"-"             shift, and enter state 169
"^"             shift, and enter state 170
"*"             shift, and enter state 171
"%"             shift, and enter state 172
"=="            fail
```

State 208

```
Exp -> Exp . "+" Exp                                    (rule 71)
Exp -> Exp . "-" Exp                                    (rule 72)
Exp -> Exp . "^" Exp                                    (rule 73)
Exp -> Exp . "*" Exp                                    (rule 74)
Exp -> Exp . "/" Exp                                    (rule 75)
```

```
Exp -> Exp . "//" Exp                                   (rule 76)
Exp -> Exp . "%" Exp                                    (rule 77)
Exp -> Exp . OR Exp                                     (rule 79)
Exp -> Exp . "||" Exp                                   (rule 80)
Exp -> Exp . AND Exp                                    (rule 81)
Exp -> Exp . "&&" Exp                                   (rule 82)
Exp -> Exp . "<" Exp                                    (rule 84)
Exp -> Exp . "<=" Exp                                   (rule 85)
Exp -> Exp . ">" Exp                                    (rule 86)
Exp -> Exp . ">=" Exp                                   (rule 87)
Exp -> Exp . "==" Exp                                   (rule 88)
Exp -> Exp . "!=" Exp                                   (rule 89)
Exp -> Exp . "!!" Exp                                   (rule 90)
Exp -> Exp "!!" Exp .                                   (rule 90)
Exp -> Exp . "." Exp                                    (rule 91)

"]"             reduce using rule 90
")"             reduce using rule 90
":"             reduce using rule 90
";"             reduce using rule 90
","             reduce using rule 90
"."             shift, and enter state 155
"!!"            reduce using rule 90
"!="            reduce using rule 90
"&&"            reduce using rule 90
"||"            reduce using rule 90
AND             reduce using rule 90
OR              reduce using rule 90
">="            reduce using rule 90
"<="            reduce using rule 90
">"             reduce using rule 90
"<"             reduce using rule 90
"/"             reduce using rule 90
"//"            reduce using rule 90
"+"             reduce using rule 90
"-"             reduce using rule 90
"^"             reduce using rule 90
"*"             reduce using rule 90
"%"             reduce using rule 90
"=="            reduce using rule 90
```

State 209

```
Exp -> Exp . "+" Exp                                    (rule 71)
Exp -> Exp . "-" Exp                                    (rule 72)
```

```
Exp -> Exp . "^" Exp                                (rule 73)
Exp -> Exp . "*" Exp                                (rule 74)
Exp -> Exp . "/" Exp                                (rule 75)
Exp -> Exp . "//" Exp                               (rule 76)
Exp -> Exp . "%" Exp                                (rule 77)
Exp -> Exp . OR Exp                                 (rule 79)
Exp -> Exp . "||" Exp                               (rule 80)
Exp -> Exp . AND Exp                                (rule 81)
Exp -> Exp . "&&" Exp                               (rule 82)
Exp -> Exp . "<" Exp                                (rule 84)
Exp -> Exp . "<=" Exp                               (rule 85)
Exp -> Exp . ">" Exp                                (rule 86)
Exp -> Exp . ">=" Exp                               (rule 87)
Exp -> Exp . "==" Exp                               (rule 88)
Exp -> Exp . "!=" Exp                               (rule 89)
Exp -> Exp . "!!" Exp                               (rule 90)
Exp -> Exp . "." Exp                                (rule 91)
Exp -> Exp "." Exp .                                (rule 91)

"]"             reduce using rule 91
")"             reduce using rule 91
":"             reduce using rule 91
";"             reduce using rule 91
","             reduce using rule 91
"."             reduce using rule 91
"!!"            reduce using rule 91
"!="            reduce using rule 91
"&&"            reduce using rule 91
"||"            reduce using rule 91
AND             reduce using rule 91
OR              reduce using rule 91
">="            reduce using rule 91
"<="            reduce using rule 91
">"             reduce using rule 91
"<"             reduce using rule 91
"/"             reduce using rule 91
"//"            reduce using rule 91
"+"             reduce using rule 91
"-"             reduce using rule 91
"^"             reduce using rule 91
"*"             reduce using rule 91
"%"             reduce using rule 91
"=="            reduce using rule 91
```

State 210

```
Ins -> Ins WHILE Exp ":" SmplDcls . Ins END         (rule 17)
SmplDcls -> SmplDcls . IsGlob PrimType Ptrs ID ";"    (rule 29)
SmplDcls -> SmplDcls . IsGlob PrimType EmptyArrs ID ";"    (rule 30)
SmplDcls -> SmplDcls . IsGlob PrimType StaticArrs ID ";"    (rule 31)
SmplDcls -> SmplDcls . IsGlob PrimType ID ";"       (rule 32)

ID              reduce using rule 2
INTDEC          reduce using rule 43
BOOLDEC         reduce using rule 43
CHARDEC         reduce using rule 43
VOIDDEC         reduce using rule 43
FLOATDEC        reduce using rule 43
GLOBAL          shift, and enter state 9
IF              reduce using rule 2
END             reduce using rule 2
WHILE           reduce using rule 2
FOR             reduce using rule 2
BEGIN           reduce using rule 2
BREAK           reduce using rule 2
CONTINUE        reduce using rule 2
RETURN          reduce using rule 2
EXIT            reduce using rule 2
READ            reduce using rule 2
WRITE           reduce using rule 2
PRINT           reduce using rule 2
FREE            reduce using rule 2

Ins             goto state 232
IsGlob          goto state 87
```

State 211

```
Exp -> Exp . "+" Exp                                (rule 71)
Exp -> Exp . "-" Exp                                (rule 72)
Exp -> Exp . "^" Exp                                (rule 73)
Exp -> Exp . "*" Exp                                (rule 74)
Exp -> Exp . "/" Exp                                (rule 75)
Exp -> Exp . "//" Exp                               (rule 76)
Exp -> Exp . "%" Exp                                (rule 77)
Exp -> Exp . OR Exp                                 (rule 79)
Exp -> Exp . "||" Exp                               (rule 80)
Exp -> Exp . AND Exp                                (rule 81)
Exp -> Exp . "&&" Exp                               (rule 82)
Exp -> Exp . "<" Exp                                (rule 84)
Exp -> Exp . "<=" Exp                               (rule 85)
```

```
Exp -> Exp . ">" Exp                                    (rule 86)
Exp -> Exp . ">=" Exp                                   (rule 87)
Exp -> Exp . "==" Exp                                   (rule 88)
Exp -> Exp . "!=" Exp                                   (rule 89)
Exp -> Exp . "!!" Exp                                   (rule 90)
Exp -> Exp . "." Exp                                    (rule 91)
Exp -> ID "(" Exp . ")"                                 (rule 93)

")"             shift, and enter state 231
"."             shift, and enter state 155
"!!"            shift, and enter state 156
"!="            shift, and enter state 157
"&&"            shift, and enter state 158
"||"            shift, and enter state 159
AND             shift, and enter state 160
OR              shift, and enter state 161
">="            shift, and enter state 162
"<="            shift, and enter state 163
">"             shift, and enter state 164
"<"             shift, and enter state 165
"/"             shift, and enter state 166
"//"            shift, and enter state 167
"+"             shift, and enter state 168
"-"             shift, and enter state 169
"^"             shift, and enter state 170
"*"             shift, and enter state 171
"%"             shift, and enter state 172
"=="            shift, and enter state 173
```

State 212

```
Exp -> Exp . "+" Exp                                    (rule 71)
Exp -> Exp . "-" Exp                                    (rule 72)
Exp -> Exp . "^" Exp                                    (rule 73)
Exp -> Exp . "*" Exp                                    (rule 74)
Exp -> Exp . "/" Exp                                    (rule 75)
Exp -> Exp . "//" Exp                                   (rule 76)
Exp -> Exp . "%" Exp                                    (rule 77)
Exp -> Exp . OR Exp                                     (rule 79)
Exp -> Exp . "||" Exp                                   (rule 80)
Exp -> Exp . AND Exp                                    (rule 81)
Exp -> Exp . "&&" Exp                                   (rule 82)
Exp -> Exp . "<" Exp                                    (rule 84)
Exp -> Exp . "<=" Exp                                   (rule 85)
Exp -> Exp . ">" Exp                                    (rule 86)
```

```
Exp -> Exp . ">=" Exp                                   (rule 87)
Exp -> Exp . "==" Exp                                   (rule 88)
Exp -> Exp . "!=" Exp                                   (rule 89)
Exp -> Exp . "!!" Exp                                   (rule 90)
Exp -> Exp . "." Exp                                    (rule 91)
Exp -> ID "[" Exp . "]"                                 (rule 92)

"]"             shift, and enter state 230
"."             shift, and enter state 155
"!!"            shift, and enter state 156
"!="            shift, and enter state 157
"&&"            shift, and enter state 158
"||"            shift, and enter state 159
AND             shift, and enter state 160
OR              shift, and enter state 161
">="            shift, and enter state 162
"<="            shift, and enter state 163
">"             shift, and enter state 164
"<"             shift, and enter state 165
"/"             shift, and enter state 166
"//"            shift, and enter state 167
"+"             shift, and enter state 168
"-"             shift, and enter state 169
"^"             shift, and enter state 170
"*"             shift, and enter state 171
"%"             shift, and enter state 172
"=="            shift, and enter state 173
```

State 213

```
Exp -> "(" Exp ")" .                                    (rule 95)

"]"             reduce using rule 95
")"             reduce using rule 95
":"             reduce using rule 95
";"             reduce using rule 95
","             reduce using rule 95
"."             reduce using rule 95
"!!"            reduce using rule 95
"!="            reduce using rule 95
"&&"            reduce using rule 95
"||"            reduce using rule 95
AND             reduce using rule 95
OR              reduce using rule 95
">="            reduce using rule 95
```

```
"<="            reduce using rule 95
">"             reduce using rule 95
"<"             reduce using rule 95
"/"             reduce using rule 95
"//"            reduce using rule 95
"+"             reduce using rule 95
"-"             reduce using rule 95
"^"             reduce using rule 95
"*"             reduce using rule 95
"%"             reduce using rule 95
"=="            reduce using rule 95
```

State 214

```
Exp -> Exp . "+" Exp                                (rule 71)
Exp -> Exp . "-" Exp                                (rule 72)
Exp -> Exp . "^" Exp                                (rule 73)
Exp -> Exp . "*" Exp                                (rule 74)
Exp -> Exp . "/" Exp                                (rule 75)
Exp -> Exp . "//" Exp                               (rule 76)
Exp -> Exp . "%" Exp                                (rule 77)
Exp -> Exp . OR Exp                                 (rule 79)
Exp -> Exp . "||" Exp                               (rule 80)
Exp -> Exp . AND Exp                                (rule 81)
Exp -> Exp . "&&" Exp                               (rule 82)
Exp -> Exp . "<" Exp                                (rule 84)
Exp -> Exp . "<=" Exp                               (rule 85)
Exp -> Exp . ">" Exp                                (rule 86)
Exp -> Exp . ">=" Exp                               (rule 87)
Exp -> Exp . "==" Exp                               (rule 88)
Exp -> Exp . "!=" Exp                               (rule 89)
Exp -> Exp . "!!" Exp                               (rule 90)
Exp -> Exp . "." Exp                                (rule 91)
Exp -> MALLOC "(" Exp . ")"                         (rule 97)

")"             shift, and enter state 229
"."             shift, and enter state 155
"!!"            shift, and enter state 156
"!="            shift, and enter state 157
"&&"            shift, and enter state 158
"||"            shift, and enter state 159
AND             shift, and enter state 160
OR              shift, and enter state 161
">="            shift, and enter state 162
"<="            shift, and enter state 163
```

```
">"             shift, and enter state 164
"<"             shift, and enter state 165
"/"             shift, and enter state 166
"//"            shift, and enter state 167
"+"             shift, and enter state 168
"-"             shift, and enter state 169
"^"             shift, and enter state 170
"*"             shift, and enter state 171
"%"             shift, and enter state 172
"=="            shift, and enter state 173
```

State 215

```
Exp -> SIZEOF "(" PrimType . ")"                    (rule 99)

")"             shift, and enter state 228
```

State 216

```
Exp -> Exp . "+" Exp                                (rule 71)
Exp -> Exp . "-" Exp                                (rule 72)
Exp -> Exp . "^" Exp                                (rule 73)
Exp -> Exp . "*" Exp                                (rule 74)
Exp -> Exp . "/" Exp                                (rule 75)
Exp -> Exp . "//" Exp                               (rule 76)
Exp -> Exp . "%" Exp                                (rule 77)
Exp -> Exp . OR Exp                                 (rule 79)
Exp -> Exp . "||" Exp                               (rule 80)
Exp -> Exp . AND Exp                                (rule 81)
Exp -> Exp . "&&" Exp                               (rule 82)
Exp -> Exp . "<" Exp                                (rule 84)
Exp -> Exp . "<=" Exp                               (rule 85)
Exp -> Exp . ">" Exp                                (rule 86)
Exp -> Exp . ">=" Exp                               (rule 87)
Exp -> Exp . "==" Exp                               (rule 88)
Exp -> Exp . "!=" Exp                               (rule 89)
Exp -> Exp . "!!" Exp                               (rule 90)
Exp -> Exp . "." Exp                                (rule 91)
Exp -> SIZEOF "(" Exp . ")"                         (rule 98)

")"             shift, and enter state 227
"."             shift, and enter state 155
"!!"            shift, and enter state 156
"!="            shift, and enter state 157
"&&"            shift, and enter state 158
```

```
"||"            shift, and enter state 159
AND             shift, and enter state 160
OR              shift, and enter state 161
">="            shift, and enter state 162
"<="            shift, and enter state 163
">"             shift, and enter state 164
"<"             shift, and enter state 165
"/"             shift, and enter state 166
"//"            shift, and enter state 167
"+"             shift, and enter state 168
"-"             shift, and enter state 169
"^"             shift, and enter state 170
"*"             shift, and enter state 171
"%"             shift, and enter state 172
"=="            shift, and enter state 173
```

State 217

```
Exp -> GET "(" ENUM . ")"                           (rule 100)

")"             shift, and enter state 226
```

State 218

```
Ins -> Ins . PRINT "(" STRING PrntArgs ")" ";"      (rule 3)
Ins -> Ins . READ "(" ID ")" ";"                    (rule 4)
Ins -> Ins . WRITE "(" ID ")" ";"                   (rule 5)
Ins -> Ins . ID "=" Exp ";"                         (rule 6)
Ins -> Ins . ID "*=" Exp ";"                        (rule 7)
Ins -> Ins . ID "+=" Exp ";"                        (rule 8)
Ins -> Ins . BREAK ";"                              (rule 9)
Ins -> Ins . CONTINUE ";"                           (rule 10)
Ins -> Ins . RETURN ";"                             (rule 11)
Ins -> Ins . EXIT ";"                               (rule 12)
Ins -> Ins . FREE "(" ID ")" ";"                    (rule 13)
Ins -> Ins . FREE "(" DATAID ")" ";"                (rule 14)
Ins -> Ins . READ "(" DATAID ")" ";"                (rule 15)
Ins -> Ins . IF ":" SmplDcls Ins NextIf Else END    (rule 16)
Ins -> Ins IF ":" SmplDcls Ins . NextIf Else END    (rule 16)
Ins -> Ins . WHILE Exp ":" SmplDcls Ins END         (rule 17)
Ins -> Ins . FOR ID "=" INT "|" INT "|" INT ":" SmplDcls Ins END    (rule 18)
Ins -> Ins . FOR ID "=" INT "|" INT ":" SmplDcls Ins END    (rule 19)
Ins -> Ins . FOR ID "=" ENUM "|" ENUM ":" SmplDcls Ins END    (rule 20)
Ins -> Ins . BEGIN SmplDcls Ins END                 (rule 21)
```

```
ID              shift, and enter state 89
IF              shift, and enter state 90
ELIF            reduce using rule 24
ELSE            reduce using rule 24
END             reduce using rule 24
WHILE           shift, and enter state 92
FOR             shift, and enter state 93
BEGIN           shift, and enter state 94
BREAK           shift, and enter state 95
CONTINUE        shift, and enter state 96
RETURN          shift, and enter state 97
EXIT            shift, and enter state 98
READ            shift, and enter state 99
WRITE           shift, and enter state 100
PRINT           shift, and enter state 101
FREE            shift, and enter state 102

NextIf          goto state 225
```

State 219

```
Ins -> Ins ID "*=" Exp ";" .                          (rule 7)

ID              reduce using rule 7
IF              reduce using rule 7
ELIF            reduce using rule 7
ELSE            reduce using rule 7
END             reduce using rule 7
WHILE           reduce using rule 7
FOR             reduce using rule 7
BEGIN           reduce using rule 7
BREAK           reduce using rule 7
CONTINUE        reduce using rule 7
RETURN          reduce using rule 7
EXIT            reduce using rule 7
READ            reduce using rule 7
WRITE           reduce using rule 7
PRINT           reduce using rule 7
FREE            reduce using rule 7
```

State 220

```
Ins -> Ins ID "+=" Exp ";" .                          (rule 8)

ID              reduce using rule 8
```

```
IF              reduce using rule 8
ELIF            reduce using rule 8
ELSE            reduce using rule 8
END             reduce using rule 8
WHILE           reduce using rule 8
FOR             reduce using rule 8
BEGIN           reduce using rule 8
BREAK           reduce using rule 8
CONTINUE        reduce using rule 8
RETURN          reduce using rule 8
EXIT            reduce using rule 8
READ            reduce using rule 8
WRITE           reduce using rule 8
PRINT           reduce using rule 8
FREE            reduce using rule 8
```

State 221

```
Ins -> Ins ID "=" Exp ";" .                          (rule 6)

ID              reduce using rule 6
IF              reduce using rule 6
ELIF            reduce using rule 6
ELSE            reduce using rule 6
END             reduce using rule 6
WHILE           reduce using rule 6
FOR             reduce using rule 6
BEGIN           reduce using rule 6
BREAK           reduce using rule 6
CONTINUE        reduce using rule 6
RETURN          reduce using rule 6
EXIT            reduce using rule 6
READ            reduce using rule 6
WRITE           reduce using rule 6
PRINT           reduce using rule 6
FREE            reduce using rule 6
```

State 222

```
SmplDcls -> SmplDcls IsGlob PrimType Ptrs ID ";" .    (rule 29)

ID              reduce using rule 29
INTDEC          reduce using rule 29
BOOLDEC         reduce using rule 29
CHARDEC         reduce using rule 29
```

```
VOIDDEC         reduce using rule 29
FLOATDEC        reduce using rule 29
GLOBAL          reduce using rule 29
IF              reduce using rule 29
ELIF            reduce using rule 29
ELSE            reduce using rule 29
END             reduce using rule 29
WHILE           reduce using rule 29
FOR             reduce using rule 29
BEGIN           reduce using rule 29
BREAK           reduce using rule 29
CONTINUE        reduce using rule 29
RETURN          reduce using rule 29
EXIT            reduce using rule 29
READ            reduce using rule 29
WRITE           reduce using rule 29
PRINT           reduce using rule 29
FREE            reduce using rule 29
```

State 223

```
SmplDcls -> SmplDcls IsGlob PrimType EmptyArrs ID ";" .    (rule 30)

ID              reduce using rule 30
INTDEC          reduce using rule 30
BOOLDEC         reduce using rule 30
CHARDEC         reduce using rule 30
VOIDDEC         reduce using rule 30
FLOATDEC        reduce using rule 30
GLOBAL          reduce using rule 30
IF              reduce using rule 30
ELIF            reduce using rule 30
ELSE            reduce using rule 30
END             reduce using rule 30
WHILE           reduce using rule 30
FOR             reduce using rule 30
BEGIN           reduce using rule 30
BREAK           reduce using rule 30
CONTINUE        reduce using rule 30
RETURN          reduce using rule 30
EXIT            reduce using rule 30
READ            reduce using rule 30
WRITE           reduce using rule 30
PRINT           reduce using rule 30
FREE            reduce using rule 30
```

State 224

```
SmplDcls -> SmplDcls IsGlob PrimType StaticArrs ID ";" .    (rule 31)

ID              reduce using rule 31
INTDEC          reduce using rule 31
BOOLDEC         reduce using rule 31
CHARDEC         reduce using rule 31
VOIDDEC         reduce using rule 31
FLOATDEC        reduce using rule 31
GLOBAL          reduce using rule 31
IF              reduce using rule 31
ELIF            reduce using rule 31
ELSE            reduce using rule 31
END             reduce using rule 31
WHILE           reduce using rule 31
FOR             reduce using rule 31
BEGIN           reduce using rule 31
BREAK           reduce using rule 31
CONTINUE        reduce using rule 31
RETURN          reduce using rule 31
EXIT            reduce using rule 31
READ            reduce using rule 31
WRITE           reduce using rule 31
PRINT           reduce using rule 31
FREE            reduce using rule 31
```

State 225

```
Ins -> Ins IF ":" SmplDcls Ins NextIf . Else END    (rule 16)
NextIf -> NextIf . ELIF ":" Ins                     (rule 25)

ELIF            shift, and enter state 248
ELSE            shift, and enter state 249
END             reduce using rule 26

Else            goto state 247
```

State 226

```
Exp -> GET "(" ENUM ")" .                           (rule 100)

"]"             reduce using rule 100
")"             reduce using rule 100
```

```
":"             reduce using rule 100
";"             reduce using rule 100
","             reduce using rule 100
"."             reduce using rule 100
"!!"            reduce using rule 100
"!="            reduce using rule 100
"&&"            reduce using rule 100
"||"            reduce using rule 100
AND             reduce using rule 100
OR              reduce using rule 100
">="            reduce using rule 100
"<="            reduce using rule 100
">"             reduce using rule 100
"<"             reduce using rule 100
"/"             reduce using rule 100
"//"            reduce using rule 100
"+"             reduce using rule 100
"-"             reduce using rule 100
"^"             reduce using rule 100
"*"             reduce using rule 100
"%"             reduce using rule 100
"=="            reduce using rule 100
```

State 227

```
Exp -> SIZEOF "(" Exp ")" .                          (rule 98)

"]"             reduce using rule 98
")"             reduce using rule 98
":"             reduce using rule 98
";"             reduce using rule 98
","             reduce using rule 98
"."             reduce using rule 98
"!!"            reduce using rule 98
"!="            reduce using rule 98
"&&"            reduce using rule 98
"||"            reduce using rule 98
AND             reduce using rule 98
OR              reduce using rule 98
">="            reduce using rule 98
"<="            reduce using rule 98
">"             reduce using rule 98
"<"             reduce using rule 98
"/"             reduce using rule 98
"//"            reduce using rule 98
```

```
"+"             reduce using rule 98
"-"             reduce using rule 98
"^"             reduce using rule 98
"*"             reduce using rule 98
"%"             reduce using rule 98
"=="            reduce using rule 98
```

State 228

```
Exp -> SIZEOF "(" PrimType ")" .                    (rule 99)

"]"             reduce using rule 99
")"             reduce using rule 99
":"             reduce using rule 99
";"             reduce using rule 99
","             reduce using rule 99
"."             reduce using rule 99
"!!"            reduce using rule 99
"!="            reduce using rule 99
"&&"            reduce using rule 99
"||"            reduce using rule 99
AND             reduce using rule 99
OR              reduce using rule 99
">="            reduce using rule 99
"<="            reduce using rule 99
">"             reduce using rule 99
"<"             reduce using rule 99
"/"             reduce using rule 99
"//"            reduce using rule 99
"+"             reduce using rule 99
"-"             reduce using rule 99
"^"             reduce using rule 99
"*"             reduce using rule 99
"%"             reduce using rule 99
"=="            reduce using rule 99
```

State 229

```
Exp -> MALLOC "(" Exp ")" .                         (rule 97)

"]"             reduce using rule 97
")"             reduce using rule 97
":"             reduce using rule 97
";"             reduce using rule 97
","             reduce using rule 97
```

```
"."             reduce using rule 97
"!!"            reduce using rule 97
"!="            reduce using rule 97
"&&"            reduce using rule 97
"||"            reduce using rule 97
AND             reduce using rule 97
OR              reduce using rule 97
">="            reduce using rule 97
"<="            reduce using rule 97
">"             reduce using rule 97
"<"             reduce using rule 97
"/"             reduce using rule 97
"//"            reduce using rule 97
"+"             reduce using rule 97
"-"             reduce using rule 97
"^"             reduce using rule 97
"*"             reduce using rule 97
"%"             reduce using rule 97
"=="            reduce using rule 97
```

State 230

```
Exp -> ID "[" Exp "]" .                                 (rule 92)

"]"             reduce using rule 92
")"             reduce using rule 92
":"             reduce using rule 92
";"             reduce using rule 92
","             reduce using rule 92
"."             reduce using rule 92
"!!"            reduce using rule 92
"!="            reduce using rule 92
"&&"            reduce using rule 92
"||"            reduce using rule 92
AND             reduce using rule 92
OR              reduce using rule 92
">="            reduce using rule 92
"<="            reduce using rule 92
">"             reduce using rule 92
"<"             reduce using rule 92
"/"             reduce using rule 92
"//"            reduce using rule 92
"+"             reduce using rule 92
"-"             reduce using rule 92
"^"             reduce using rule 92
```

```
"*"             reduce using rule 92
"%"             reduce using rule 92
"=="            reduce using rule 92
```

State 231

```
Exp -> ID "(" Exp ")" .                                 (rule 93)

"]"             reduce using rule 93
")"             reduce using rule 93
":"             reduce using rule 93
";"             reduce using rule 93
","             reduce using rule 93
"."             reduce using rule 93
"!!"            reduce using rule 93
"!="            reduce using rule 93
"&&"            reduce using rule 93
"||"            reduce using rule 93
AND             reduce using rule 93
OR              reduce using rule 93
">="            reduce using rule 93
"<="            reduce using rule 93
">"             reduce using rule 93
"<"             reduce using rule 93
"/"             reduce using rule 93
"//"            reduce using rule 93
"+"             reduce using rule 93
"-"             reduce using rule 93
"^"             reduce using rule 93
"*"             reduce using rule 93
"%"             reduce using rule 93
"=="            reduce using rule 93
```

State 232

```
Ins -> Ins . PRINT "(" STRING PrntArgs ")" ";"      (rule 3)
Ins -> Ins . READ "(" ID ")" ";"                    (rule 4)
Ins -> Ins . WRITE "(" ID ")" ";"                   (rule 5)
Ins -> Ins . ID "=" Exp ";"                         (rule 6)
Ins -> Ins . ID "*=" Exp ";"                        (rule 7)
Ins -> Ins . ID "+=" Exp ";"                        (rule 8)
Ins -> Ins . BREAK ";"                              (rule 9)
Ins -> Ins . CONTINUE ";"                           (rule 10)
Ins -> Ins . RETURN ";"                             (rule 11)
Ins -> Ins . EXIT ";"                               (rule 12)
```

```
Ins -> Ins . FREE "(" ID ")" ";"                    (rule 13)
Ins -> Ins . FREE "(" DATAID ")" ";"                (rule 14)
Ins -> Ins . READ "(" DATAID ")" ";"                (rule 15)
Ins -> Ins . IF ":" SmplDcls Ins NextIf Else END    (rule 16)
Ins -> Ins . WHILE Exp ":" SmplDcls Ins END         (rule 17)
Ins -> Ins WHILE Exp ":" SmplDcls Ins . END         (rule 17)
Ins -> Ins . FOR ID "=" INT "|" INT "|" INT ":" SmplDcls Ins END    (rule 18)
Ins -> Ins . FOR ID "=" INT "|" INT ":" SmplDcls Ins END    (rule 19)
Ins -> Ins . FOR ID "=" ENUM "|" ENUM ":" SmplDcls Ins END    (rule 20)
Ins -> Ins . BEGIN SmplDcls Ins END                 (rule 21)

ID              shift, and enter state 89
IF              shift, and enter state 90
END             shift, and enter state 246
WHILE           shift, and enter state 92
FOR             shift, and enter state 93
BEGIN           shift, and enter state 94
BREAK           shift, and enter state 95
CONTINUE        shift, and enter state 96
RETURN          shift, and enter state 97
EXIT            shift, and enter state 98
READ            shift, and enter state 99
WRITE           shift, and enter state 100
PRINT           shift, and enter state 101
FREE            shift, and enter state 102
```

State 233

```
Ins -> Ins FOR ID "=" ENUM "|" . ENUM ":" SmplDcls Ins END    (rule 20)

ENUM            shift, and enter state 245
```

State 234

```
Ins -> Ins FOR ID "=" INT "|" . INT "|" INT ":" SmplDcls Ins END    (rule 18)
Ins -> Ins FOR ID "=" INT "|" . INT ":" SmplDcls Ins END    (rule 19)

INT             shift, and enter state 244
```

State 235

```
Ins -> Ins READ "(" ID ")" ";" .                    (rule 4)

ID              reduce using rule 4
```

```
IF              reduce using rule 4
ELIF            reduce using rule 4
ELSE            reduce using rule 4
END             reduce using rule 4
WHILE           reduce using rule 4
FOR             reduce using rule 4
BEGIN           reduce using rule 4
BREAK           reduce using rule 4
CONTINUE        reduce using rule 4
RETURN          reduce using rule 4
EXIT            reduce using rule 4
READ            reduce using rule 4
WRITE           reduce using rule 4
PRINT           reduce using rule 4
FREE            reduce using rule 4
```

State 236

```
Ins -> Ins READ "(" DATAID ")" ";" .                (rule 15)

ID              reduce using rule 15
IF              reduce using rule 15
ELIF            reduce using rule 15
ELSE            reduce using rule 15
END             reduce using rule 15
WHILE           reduce using rule 15
FOR             reduce using rule 15
BEGIN           reduce using rule 15
BREAK           reduce using rule 15
CONTINUE        reduce using rule 15
RETURN          reduce using rule 15
EXIT            reduce using rule 15
READ            reduce using rule 15
WRITE           reduce using rule 15
PRINT           reduce using rule 15
FREE            reduce using rule 15
```

State 237

```
Ins -> Ins WRITE "(" ID ")" ";" .                   (rule 5)

ID              reduce using rule 5
IF              reduce using rule 5
ELIF            reduce using rule 5
ELSE            reduce using rule 5
```

```
END             reduce using rule 5
WHILE           reduce using rule 5
FOR             reduce using rule 5
BEGIN           reduce using rule 5
BREAK           reduce using rule 5
CONTINUE        reduce using rule 5
RETURN          reduce using rule 5
EXIT            reduce using rule 5
READ            reduce using rule 5
WRITE           reduce using rule 5
PRINT           reduce using rule 5
FREE            reduce using rule 5
```

State 238

```
Ins -> Ins PRINT "(" STRING PrntArgs ")" . ";"      (rule 3)

";"             shift, and enter state 243
```

State 239

```
PrntArgs -> PrntArgs "," . Exp                      (rule 23)

ID              shift, and enter state 115
DATAID          shift, and enter state 116
"("             shift, and enter state 117
"!"             shift, and enter state 118
"-"             shift, and enter state 119
"*"             shift, and enter state 120
MALLOC          shift, and enter state 121
SIZEOF          shift, and enter state 122
GET             shift, and enter state 123
TRUE            shift, and enter state 124
FALSE           shift, and enter state 125
CHAR            shift, and enter state 126
INT             shift, and enter state 127
FLOAT           shift, and enter state 128

Exp             goto state 242
Term            goto state 114
```

State 240

```
Ins -> Ins FREE "(" ID ")" ";" .                    (rule 13)
```

```
ID              reduce using rule 13
IF              reduce using rule 13
ELIF            reduce using rule 13
ELSE            reduce using rule 13
END             reduce using rule 13
WHILE           reduce using rule 13
FOR             reduce using rule 13
BEGIN           reduce using rule 13
BREAK           reduce using rule 13
CONTINUE        reduce using rule 13
RETURN          reduce using rule 13
EXIT            reduce using rule 13
READ            reduce using rule 13
WRITE           reduce using rule 13
PRINT           reduce using rule 13
FREE            reduce using rule 13
```

State 241

```
Ins -> Ins FREE "(" DATAID ")" ";" .                (rule 14)

ID              reduce using rule 14
IF              reduce using rule 14
ELIF            reduce using rule 14
ELSE            reduce using rule 14
END             reduce using rule 14
WHILE           reduce using rule 14
FOR             reduce using rule 14
BEGIN           reduce using rule 14
BREAK           reduce using rule 14
CONTINUE        reduce using rule 14
RETURN          reduce using rule 14
EXIT            reduce using rule 14
READ            reduce using rule 14
WRITE           reduce using rule 14
PRINT           reduce using rule 14
FREE            reduce using rule 14
```

State 242

```
PrntArgs -> PrntArgs "," Exp .                      (rule 23)
Exp -> Exp . "+" Exp                                (rule 71)
Exp -> Exp . "-" Exp                                (rule 72)
Exp -> Exp . "^" Exp                                (rule 73)
```

```
Exp -> Exp . "*" Exp                                    (rule 74)
Exp -> Exp . "/" Exp                                    (rule 75)
Exp -> Exp . "//" Exp                                   (rule 76)
Exp -> Exp . "%" Exp                                    (rule 77)
Exp -> Exp . OR Exp                                     (rule 79)
Exp -> Exp . "||" Exp                                   (rule 80)
Exp -> Exp . AND Exp                                    (rule 81)
Exp -> Exp . "&&" Exp                                   (rule 82)
Exp -> Exp . "<" Exp                                    (rule 84)
Exp -> Exp . "<=" Exp                                   (rule 85)
Exp -> Exp . ">" Exp                                    (rule 86)
Exp -> Exp . ">=" Exp                                   (rule 87)
Exp -> Exp . "==" Exp                                   (rule 88)
Exp -> Exp . "!=" Exp                                   (rule 89)
Exp -> Exp . "!!" Exp                                   (rule 90)
Exp -> Exp . "." Exp                                    (rule 91)

")"             reduce using rule 23
","             reduce using rule 23
"."             shift, and enter state 155
"!!"            shift, and enter state 156
"!="            shift, and enter state 157
"&&"            shift, and enter state 158
"||"            shift, and enter state 159
AND             shift, and enter state 160
OR              shift, and enter state 161
">="            shift, and enter state 162
"<="            shift, and enter state 163
">"             shift, and enter state 164
"<"             shift, and enter state 165
"/"             shift, and enter state 166
"//"            shift, and enter state 167
"+"             shift, and enter state 168
"-"             shift, and enter state 169
"^"             shift, and enter state 170
"*"             shift, and enter state 171
"%"             shift, and enter state 172
"=="            shift, and enter state 173
```

State 243

```
Ins -> Ins PRINT "(" STRING PrntArgs ")" ";" .      (rule 3)

ID              reduce using rule 3
IF              reduce using rule 3
```

```
ELIF            reduce using rule 3
ELSE            reduce using rule 3
END             reduce using rule 3
WHILE           reduce using rule 3
FOR             reduce using rule 3
BEGIN           reduce using rule 3
BREAK           reduce using rule 3
CONTINUE        reduce using rule 3
RETURN          reduce using rule 3
EXIT            reduce using rule 3
READ            reduce using rule 3
WRITE           reduce using rule 3
PRINT           reduce using rule 3
FREE            reduce using rule 3
```

State 244

```
Ins -> Ins FOR ID "=" INT "|" INT . "|" INT ":" SmplDcls Ins END    (rule 18)
Ins -> Ins FOR ID "=" INT "|" INT . ":" SmplDcls Ins END    (rule 19)

"|"             shift, and enter state 254
":"             shift, and enter state 255
```

State 245

```
Ins -> Ins FOR ID "=" ENUM "|" ENUM . ":" SmplDcls Ins END    (rule 20)

":"             shift, and enter state 253
```

State 246

```
Ins -> Ins WHILE Exp ":" SmplDcls Ins END .         (rule 17)

ID              reduce using rule 17
IF              reduce using rule 17
ELIF            reduce using rule 17
ELSE            reduce using rule 17
END             reduce using rule 17
WHILE           reduce using rule 17
FOR             reduce using rule 17
BEGIN           reduce using rule 17
BREAK           reduce using rule 17
CONTINUE        reduce using rule 17
RETURN          reduce using rule 17
```

```
EXIT            reduce using rule 17
READ            reduce using rule 17
WRITE           reduce using rule 17
PRINT           reduce using rule 17
FREE            reduce using rule 17
```

State 247

```
Ins -> Ins IF ":" SmplDcls Ins NextIf Else . END    (rule 16)

END             shift, and enter state 252
```

State 248

```
NextIf -> NextIf ELIF . ":" Ins                     (rule 25)

":"             shift, and enter state 251
```

State 249

```
Else -> ELSE . ":" Ins                              (rule 27)

":"             shift, and enter state 250
```

State 250

```
Else -> ELSE ":" . Ins                              (rule 27)

ID              reduce using rule 2
IF              reduce using rule 2
END             reduce using rule 2
WHILE           reduce using rule 2
FOR             reduce using rule 2
BEGIN           reduce using rule 2
BREAK           reduce using rule 2
CONTINUE        reduce using rule 2
RETURN          reduce using rule 2
EXIT            reduce using rule 2
READ            reduce using rule 2
WRITE           reduce using rule 2
PRINT           reduce using rule 2
FREE            reduce using rule 2

Ins             goto state 260
```

State 251

```
NextIf -> NextIf ELIF ":" . Ins                    (rule 25)

ID              reduce using rule 2
IF              reduce using rule 2
ELIF            reduce using rule 2
ELSE            reduce using rule 2
END             reduce using rule 2
WHILE           reduce using rule 2
FOR             reduce using rule 2
BEGIN           reduce using rule 2
BREAK           reduce using rule 2
CONTINUE        reduce using rule 2
RETURN          reduce using rule 2
EXIT            reduce using rule 2
READ            reduce using rule 2
WRITE           reduce using rule 2
PRINT           reduce using rule 2
FREE            reduce using rule 2

Ins             goto state 259
```

State 252

```
Ins -> Ins IF ":" SmplDcls Ins NextIf Else END .    (rule 16)

ID              reduce using rule 16
IF              reduce using rule 16
ELIF            reduce using rule 16
ELSE            reduce using rule 16
END             reduce using rule 16
WHILE           reduce using rule 16
FOR             reduce using rule 16
BEGIN           reduce using rule 16
BREAK           reduce using rule 16
CONTINUE        reduce using rule 16
RETURN          reduce using rule 16
EXIT            reduce using rule 16
READ            reduce using rule 16
WRITE           reduce using rule 16
PRINT           reduce using rule 16
FREE            reduce using rule 16
```

State 253

```
Ins -> Ins FOR ID "=" ENUM "|" ENUM ":" . SmplDcls Ins END    (rule 20)

ID              reduce using rule 28
INTDEC          reduce using rule 28
BOOLDEC         reduce using rule 28
CHARDEC         reduce using rule 28
VOIDDEC         reduce using rule 28
FLOATDEC        reduce using rule 28
GLOBAL          reduce using rule 28
IF              reduce using rule 28
END             reduce using rule 28
WHILE           reduce using rule 28
FOR             reduce using rule 28
BEGIN           reduce using rule 28
BREAK           reduce using rule 28
CONTINUE        reduce using rule 28
RETURN          reduce using rule 28
EXIT            reduce using rule 28
READ            reduce using rule 28
WRITE           reduce using rule 28
PRINT           reduce using rule 28
FREE            reduce using rule 28

SmplDcls        goto state 258
```

State 254

```
Ins -> Ins FOR ID "=" INT "|" INT "|" . INT ":" SmplDcls Ins END    (rule 18)

INT             shift, and enter state 257
```

State 255

```
Ins -> Ins FOR ID "=" INT "|" INT ":" . SmplDcls Ins END    (rule 19)

ID              reduce using rule 28
INTDEC          reduce using rule 28
BOOLDEC         reduce using rule 28
CHARDEC         reduce using rule 28
VOIDDEC         reduce using rule 28
FLOATDEC        reduce using rule 28
GLOBAL          reduce using rule 28
IF              reduce using rule 28
END             reduce using rule 28
WHILE           reduce using rule 28
```

```
FOR             reduce using rule 28
BEGIN           reduce using rule 28
BREAK           reduce using rule 28
CONTINUE        reduce using rule 28
RETURN          reduce using rule 28
EXIT            reduce using rule 28
READ            reduce using rule 28
WRITE           reduce using rule 28
PRINT           reduce using rule 28
FREE            reduce using rule 28

SmplDcls        goto state 256
```

State 256

```
Ins -> Ins FOR ID "=" INT "|" INT ":" SmplDcls . Ins END    (rule 19)
SmplDcls -> SmplDcls . IsGlob PrimType Ptrs ID ";"    (rule 29)
SmplDcls -> SmplDcls . IsGlob PrimType EmptyArrs ID ";"    (rule 30)
SmplDcls -> SmplDcls . IsGlob PrimType StaticArrs ID ";"    (rule 31)
SmplDcls -> SmplDcls . IsGlob PrimType ID ";"       (rule 32)

ID              reduce using rule 2
INTDEC          reduce using rule 43
BOOLDEC         reduce using rule 43
CHARDEC         reduce using rule 43
VOIDDEC         reduce using rule 43
FLOATDEC        reduce using rule 43
GLOBAL          shift, and enter state 9
IF              reduce using rule 2
END             reduce using rule 2
WHILE           reduce using rule 2
FOR             reduce using rule 2
BEGIN           reduce using rule 2
BREAK           reduce using rule 2
CONTINUE        reduce using rule 2
RETURN          reduce using rule 2
EXIT            reduce using rule 2
READ            reduce using rule 2
WRITE           reduce using rule 2
PRINT           reduce using rule 2
FREE            reduce using rule 2

Ins             goto state 263
IsGlob          goto state 87
```

State 257

```
Ins -> Ins FOR ID "=" INT "|" INT "|" INT . ":" SmplDcls Ins END    (rule 18)

":"            shift, and enter state 262
```

State 258

```
Ins -> Ins FOR ID "=" ENUM "|" ENUM ":" SmplDcls . Ins END    (rule 20)
SmplDcls -> SmplDcls . IsGlob PrimType Ptrs ID ";"    (rule 29)
SmplDcls -> SmplDcls . IsGlob PrimType EmptyArrs ID ";"    (rule 30)
SmplDcls -> SmplDcls . IsGlob PrimType StaticArrs ID ";"    (rule 31)
SmplDcls -> SmplDcls . IsGlob PrimType ID ";"       (rule 32)

ID             reduce using rule 2
INTDEC         reduce using rule 43
BOOLDEC        reduce using rule 43
CHARDEC        reduce using rule 43
VOIDDEC        reduce using rule 43
FLOATDEC       reduce using rule 43
GLOBAL         shift, and enter state 9
IF             reduce using rule 2
END            reduce using rule 2
WHILE          reduce using rule 2
FOR            reduce using rule 2
BEGIN          reduce using rule 2
BREAK          reduce using rule 2
CONTINUE       reduce using rule 2
RETURN         reduce using rule 2
EXIT           reduce using rule 2
READ           reduce using rule 2
WRITE          reduce using rule 2
PRINT          reduce using rule 2
FREE           reduce using rule 2

Ins            goto state 261
IsGlob         goto state 87
```

State 259

```
Ins -> Ins . PRINT "(" STRING PrntArgs ")" ";"      (rule 3)
Ins -> Ins . READ "(" ID ")" ";"                    (rule 4)
Ins -> Ins . WRITE "(" ID ")" ";"                   (rule 5)
Ins -> Ins . ID "=" Exp ";"                         (rule 6)
Ins -> Ins . ID "*=" Exp ";"                        (rule 7)
Ins -> Ins . ID "+=" Exp ";"                        (rule 8)
Ins -> Ins . BREAK ";"                              (rule 9)
```

```
Ins -> Ins . CONTINUE ";"                          (rule 10)
Ins -> Ins . RETURN ";"                            (rule 11)
Ins -> Ins . EXIT ";"                              (rule 12)
Ins -> Ins . FREE "(" ID ")" ";"                   (rule 13)
Ins -> Ins . FREE "(" DATAID ")" ";"               (rule 14)
Ins -> Ins . READ "(" DATAID ")" ";"               (rule 15)
Ins -> Ins . IF ":" SmplDcls Ins NextIf Else END   (rule 16)
Ins -> Ins . WHILE Exp ":" SmplDcls Ins END        (rule 17)
Ins -> Ins . FOR ID "=" INT "|" INT "|" INT ":" SmplDcls Ins END    (rule 18)
Ins -> Ins . FOR ID "=" INT "|" INT ":" SmplDcls Ins END    (rule 19)
Ins -> Ins . FOR ID "=" ENUM "|" ENUM ":" SmplDcls Ins END    (rule 20)
Ins -> Ins . BEGIN SmplDcls Ins END                (rule 21)
NextIf -> NextIf ELIF ":" Ins .                    (rule 25)

ID             shift, and enter state 89
IF             shift, and enter state 90
ELIF           reduce using rule 25
ELSE           reduce using rule 25
END            reduce using rule 25
WHILE          shift, and enter state 92
FOR            shift, and enter state 93
BEGIN          shift, and enter state 94
BREAK          shift, and enter state 95
CONTINUE       shift, and enter state 96
RETURN         shift, and enter state 97
EXIT           shift, and enter state 98
READ           shift, and enter state 99
WRITE          shift, and enter state 100
PRINT          shift, and enter state 101
FREE           shift, and enter state 102
```

State 260

```
Ins -> Ins . PRINT "(" STRING PrntArgs ")" ";"     (rule 3)
Ins -> Ins . READ "(" ID ")" ";"                   (rule 4)
Ins -> Ins . WRITE "(" ID ")" ";"                  (rule 5)
Ins -> Ins . ID "=" Exp ";"                        (rule 6)
Ins -> Ins . ID "*=" Exp ";"                       (rule 7)
Ins -> Ins . ID "+=" Exp ";"                       (rule 8)
Ins -> Ins . BREAK ";"                             (rule 9)
Ins -> Ins . CONTINUE ";"                          (rule 10)
Ins -> Ins . RETURN ";"                            (rule 11)
Ins -> Ins . EXIT ";"                              (rule 12)
Ins -> Ins . FREE "(" ID ")" ";"                   (rule 13)
Ins -> Ins . FREE "(" DATAID ")" ";"               (rule 14)
```

```
Ins -> Ins . READ "(" DATAID ")" ";"                (rule 15)
Ins -> Ins . IF ":" SmplDcls Ins NextIf Else END    (rule 16)
Ins -> Ins . WHILE Exp ":" SmplDcls Ins END         (rule 17)
Ins -> Ins . FOR ID "=" INT "|" INT "|" INT ":" SmplDcls Ins END    (rule 18)
Ins -> Ins . FOR ID "=" INT "|" INT ":" SmplDcls Ins END    (rule 19)
Ins -> Ins . FOR ID "=" ENUM "|" ENUM ":" SmplDcls Ins END    (rule 20)
Ins -> Ins . BEGIN SmplDcls Ins END                 (rule 21)
Else -> ELSE ":" Ins .                              (rule 27)

ID              shift, and enter state 89
IF              shift, and enter state 90
END             reduce using rule 27
WHILE           shift, and enter state 92
FOR             shift, and enter state 93
BEGIN           shift, and enter state 94
BREAK           shift, and enter state 95
CONTINUE        shift, and enter state 96
RETURN          shift, and enter state 97
EXIT            shift, and enter state 98
READ            shift, and enter state 99
WRITE           shift, and enter state 100
PRINT           shift, and enter state 101
FREE            shift, and enter state 102
```

State 261

```
Ins -> Ins . PRINT "(" STRING PrntArgs ")" ";"      (rule 3)
Ins -> Ins . READ "(" ID ")" ";"                    (rule 4)
Ins -> Ins . WRITE "(" ID ")" ";"                   (rule 5)
Ins -> Ins . ID "=" Exp ";"                         (rule 6)
Ins -> Ins . ID "*=" Exp ";"                        (rule 7)
Ins -> Ins . ID "+=" Exp ";"                        (rule 8)
Ins -> Ins . BREAK ";"                              (rule 9)
Ins -> Ins . CONTINUE ";"                           (rule 10)
Ins -> Ins . RETURN ";"                             (rule 11)
Ins -> Ins . EXIT ";"                               (rule 12)
Ins -> Ins . FREE "(" ID ")" ";"                    (rule 13)
Ins -> Ins . FREE "(" DATAID ")" ";"                (rule 14)
Ins -> Ins . READ "(" DATAID ")" ";"                (rule 15)
Ins -> Ins . IF ":" SmplDcls Ins NextIf Else END    (rule 16)
Ins -> Ins . WHILE Exp ":" SmplDcls Ins END         (rule 17)
Ins -> Ins . FOR ID "=" INT "|" INT "|" INT ":" SmplDcls Ins END    (rule 18)
Ins -> Ins . FOR ID "=" INT "|" INT ":" SmplDcls Ins END    (rule 19)
Ins -> Ins . FOR ID "=" ENUM "|" ENUM ":" SmplDcls Ins END    (rule 20)
Ins -> Ins FOR ID "=" ENUM "|" ENUM ":" SmplDcls Ins . END    (rule 20)
```

```
Ins -> Ins . BEGIN SmplDcls Ins END                (rule 21)

ID              shift, and enter state 89
IF              shift, and enter state 90
END             shift, and enter state 266
WHILE           shift, and enter state 92
FOR             shift, and enter state 93
BEGIN           shift, and enter state 94
BREAK           shift, and enter state 95
CONTINUE        shift, and enter state 96
RETURN          shift, and enter state 97
EXIT            shift, and enter state 98
READ            shift, and enter state 99
WRITE           shift, and enter state 100
PRINT           shift, and enter state 101
FREE            shift, and enter state 102
```

State 262

```
Ins -> Ins FOR ID "=" INT "|" INT "|" INT ":" . SmplDcls Ins END    (rule 18)

ID              reduce using rule 28
INTDEC          reduce using rule 28
BOOLDEC         reduce using rule 28
CHARDEC         reduce using rule 28
VOIDDEC         reduce using rule 28
FLOATDEC        reduce using rule 28
GLOBAL          reduce using rule 28
IF              reduce using rule 28
END             reduce using rule 28
WHILE           reduce using rule 28
FOR             reduce using rule 28
BEGIN           reduce using rule 28
BREAK           reduce using rule 28
CONTINUE        reduce using rule 28
RETURN          reduce using rule 28
EXIT            reduce using rule 28
READ            reduce using rule 28
WRITE           reduce using rule 28
PRINT           reduce using rule 28
FREE            reduce using rule 28

SmplDcls        goto state 265
```

State 263

```
Ins -> Ins . PRINT "(" STRING PrntArgs ")" ";"      (rule 3)
Ins -> Ins . READ "(" ID ")" ";"                    (rule 4)
Ins -> Ins . WRITE "(" ID ")" ";"                   (rule 5)
Ins -> Ins . ID "=" Exp ";"                         (rule 6)
Ins -> Ins . ID "*=" Exp ";"                        (rule 7)
Ins -> Ins . ID "+=" Exp ";"                        (rule 8)
Ins -> Ins . BREAK ";"                              (rule 9)
Ins -> Ins . CONTINUE ";"                           (rule 10)
Ins -> Ins . RETURN ";"                             (rule 11)
Ins -> Ins . EXIT ";"                               (rule 12)
Ins -> Ins . FREE "(" ID ")" ";"                    (rule 13)
Ins -> Ins . FREE "(" DATAID ")" ";"                (rule 14)
Ins -> Ins . READ "(" DATAID ")" ";"                (rule 15)
Ins -> Ins . IF ":" SmplDcls Ins NextIf Else END    (rule 16)
Ins -> Ins . WHILE Exp ":" SmplDcls Ins END         (rule 17)
Ins -> Ins . FOR ID "=" INT "|" INT "|" INT ":" SmplDcls Ins END    (rule 18)
Ins -> Ins . FOR ID "=" INT "|" INT ":" SmplDcls Ins END    (rule 19)
Ins -> Ins FOR ID "=" INT "|" INT ":" SmplDcls Ins . END    (rule 19)
Ins -> Ins . FOR ID "=" ENUM "|" ENUM ":" SmplDcls Ins END    (rule 20)
Ins -> Ins . BEGIN SmplDcls Ins END                 (rule 21)

ID              shift, and enter state 89
IF              shift, and enter state 90
END             shift, and enter state 264
WHILE           shift, and enter state 92
FOR             shift, and enter state 93
BEGIN           shift, and enter state 94
BREAK           shift, and enter state 95
CONTINUE        shift, and enter state 96
RETURN          shift, and enter state 97
EXIT            shift, and enter state 98
READ            shift, and enter state 99
WRITE           shift, and enter state 100
PRINT           shift, and enter state 101
FREE            shift, and enter state 102
```

State 264

```
Ins -> Ins FOR ID "=" INT "|" INT ":" SmplDcls Ins END .    (rule 19)

ID              reduce using rule 19
IF              reduce using rule 19
ELIF            reduce using rule 19
ELSE            reduce using rule 19
END             reduce using rule 19
```

```
WHILE          reduce using rule 19
FOR            reduce using rule 19
BEGIN          reduce using rule 19
BREAK          reduce using rule 19
CONTINUE       reduce using rule 19
RETURN         reduce using rule 19
EXIT           reduce using rule 19
READ           reduce using rule 19
WRITE          reduce using rule 19
PRINT          reduce using rule 19
FREE           reduce using rule 19
```

State 265

```
Ins -> Ins FOR ID "=" INT "|" INT "|" INT ":" SmplDcls . Ins END    (rule 18)
SmplDcls -> SmplDcls . IsGlob PrimType Ptrs ID ";"    (rule 29)
SmplDcls -> SmplDcls . IsGlob PrimType EmptyArrs ID ";"    (rule 30)
SmplDcls -> SmplDcls . IsGlob PrimType StaticArrs ID ";"    (rule 31)
SmplDcls -> SmplDcls . IsGlob PrimType ID ";"       (rule 32)

ID             reduce using rule 2
INTDEC         reduce using rule 43
BOOLDEC        reduce using rule 43
CHARDEC        reduce using rule 43
VOIDDEC        reduce using rule 43
FLOATDEC       reduce using rule 43
GLOBAL         shift, and enter state 9
IF             reduce using rule 2
END            reduce using rule 2
WHILE          reduce using rule 2
FOR            reduce using rule 2
BEGIN          reduce using rule 2
BREAK          reduce using rule 2
CONTINUE       reduce using rule 2
RETURN         reduce using rule 2
EXIT           reduce using rule 2
READ           reduce using rule 2
WRITE          reduce using rule 2
PRINT          reduce using rule 2
FREE           reduce using rule 2

Ins            goto state 267
IsGlob         goto state 87
```

State 266

```
Ins -> Ins FOR ID "=" ENUM "|" ENUM ":" SmplDcls Ins END .    (rule 20)

ID             reduce using rule 20
IF             reduce using rule 20
ELIF           reduce using rule 20
ELSE           reduce using rule 20
END            reduce using rule 20
WHILE          reduce using rule 20
FOR            reduce using rule 20
BEGIN          reduce using rule 20
BREAK          reduce using rule 20
CONTINUE       reduce using rule 20
RETURN         reduce using rule 20
EXIT           reduce using rule 20
READ           reduce using rule 20
WRITE          reduce using rule 20
PRINT          reduce using rule 20
FREE           reduce using rule 20
```

State 267

```
Ins -> Ins . PRINT "(" STRING PrntArgs ")" ";"      (rule 3)
Ins -> Ins . READ "(" ID ")" ";"                    (rule 4)
Ins -> Ins . WRITE "(" ID ")" ";"                   (rule 5)
Ins -> Ins . ID "=" Exp ";"                         (rule 6)
Ins -> Ins . ID "*=" Exp ";"                        (rule 7)
Ins -> Ins . ID "+=" Exp ";"                        (rule 8)
Ins -> Ins . BREAK ";"                              (rule 9)
Ins -> Ins . CONTINUE ";"                           (rule 10)
Ins -> Ins . RETURN ";"                             (rule 11)
Ins -> Ins . EXIT ";"                               (rule 12)
Ins -> Ins . FREE "(" ID ")" ";"                    (rule 13)
Ins -> Ins . FREE "(" DATAID ")" ";"                (rule 14)
Ins -> Ins . READ "(" DATAID ")" ";"                (rule 15)
Ins -> Ins . IF ":" SmplDcls Ins NextIf Else END    (rule 16)
Ins -> Ins . WHILE Exp ":" SmplDcls Ins END         (rule 17)
Ins -> Ins . FOR ID "=" INT "|" INT "|" INT ":" SmplDcls Ins END    (rule 18)
Ins -> Ins FOR ID "=" INT "|" INT "|" INT ":" SmplDcls Ins . END    (rule 18)
Ins -> Ins . FOR ID "=" INT "|" INT ":" SmplDcls Ins END    (rule 19)
Ins -> Ins . FOR ID "=" ENUM "|" ENUM ":" SmplDcls Ins END    (rule 20)
Ins -> Ins . BEGIN SmplDcls Ins END                 (rule 21)

ID             shift, and enter state 89
IF             shift, and enter state 90
END            shift, and enter state 268
```

```
WHILE          shift, and enter state 92
FOR            shift, and enter state 93
BEGIN          shift, and enter state 94
BREAK          shift, and enter state 95
CONTINUE       shift, and enter state 96
RETURN         shift, and enter state 97
EXIT           shift, and enter state 98
READ           shift, and enter state 99
WRITE          shift, and enter state 100
PRINT          shift, and enter state 101
FREE           shift, and enter state 102
```

State 268

```
Ins -> Ins FOR ID "=" INT "|" INT "|" INT ":" SmplDcls Ins END .    (rule 18)

ID             reduce using rule 18
IF             reduce using rule 18
ELIF           reduce using rule 18
ELSE           reduce using rule 18
END            reduce using rule 18
WHILE          reduce using rule 18
FOR            reduce using rule 18
BEGIN          reduce using rule 18
BREAK          reduce using rule 18
CONTINUE       reduce using rule 18
RETURN         reduce using rule 18
EXIT           reduce using rule 18
READ           reduce using rule 18
WRITE          reduce using rule 18
PRINT          reduce using rule 18
FREE           reduce using rule 18
```

Grammar Totals

Number of rules: 108 Number of terminals: 71 Number of non-terminals: 20
Number of states: 269