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PROGRAM -> program IDENTIFIER BLOCK

IDENTIFIER. -> STARTCHAR RESTCHAR INCREMENTALOP

STARTCHAR -> LETTER | \$

LETTER -> a | b | c | ... | z | A | B | C | ... | Z

DIGIT -> 0 | 1 | ... | 9

RESTCHAR -> POSSIBLECHAR RESTCHAR

POSSIBLECHAR -> LETTER | DIGIT | \$ | . | _

BLOCK -> begin STATEMENT end

STATEMENT -> IF_BLOCK STATEMENT | ASSIGNMENT STATEMENT | PRINT STATEMENT | DISPLAY STATEMENT | FOR_STMT STATEMENT | WHILE_STMT STATEMENT | break; | IF_BLOCK | ASSIGNMENT | PRINT | FOR_STMT | WHILE_STMT

IF_BLOCK -> IF_STMT | IF_STMT ELSE_IF_STMT | IF_STMT ELSE_STMT | IF_STMT ELSE_IF_STMT ELSE_STMT

IF_STMT -> if (COMPARISON_STMT) BLOCK

ELSE_IF_STMT -> else_if (COMPARISON_STMT) BLOCK | else_if (COMPARISON_STMT) BLOCK ELSE_IF_STMT

ELSE_STMT -> else BLOCK

TYPE -> int | integer | /eps

COMPARISON_STMT -> NUMORID COMPARISON_OP NUMORID

ASSIGNMENT -> TYPE ASSIGN ;

ASSIGN -> IDENTIFIER = ASSIGNED | ASSIGN , IDENTIFIER = ASSIGNED

ASSIGNED -> NUMORID ARITHOP ASSIGNED | NUMORID

NUMORID -> NUMBER | IDENTIDIFER

PRINT -> print_line (" STRING ") ;

STRING -> LETTER | LETTER STRING

NUMBER -> DIGIT | DIGIT NUMBER

COMPARISON_OP -> > | < | == | != | <= | >=

ARITHOP -> + | - | / | *

INCREMENTALOP -> ++ | /eps

DISPLAY -> display (" string ") ;

FOR_STMT -> for (ASSIGNMENT ; COMPARISON_STMT ; IDENTIFIER) BLOCK

WHILE_STMT -> while (COMPARSION_STMT) BLOCK

PROGRAM -> program IDENTIFIER BLOCK
 IDENTIFIER. -> STARTCHAR RESTCHAR INCREMENTALOP
 STARTCHAR -> LETTER | \$
 LETTER -> a | b | c | ... | z | A | B | C | ... | Z
 DIGIT -> 0 | 1 | ... | 9
 RESTCHAR -> POSSIBLECHAR RESTCHAR'
 RESTCHAR' -> POSSIBLECHAR RESTCHAR' | /eps
 POSSIBLECHAR -> LETTER | DIGIT | \$ | . | _
 BLOCK -> begin STATEMENT end
 STATEMENT -> IF_BLOCK STMT | ASSIGNMENT STMT | PRINT STMT | DISPLAY STMT | FOR_STMT
 STMT | WHILE_STMT STMT
 STMT -> IF_BLOCK STMT | ASSIGNMENT STMT | PRINT STMT | DISPLAY STMT | FOR_STMT STMT |
 WHILE_STMT STMT | break; | /eps
 IF_BLOCK -> IF_STMT | IF_STMT ELSE_IF_STMT | IF_STMT ELSE_STMT | IF_STMT ELSE_IF_STMT
 ELSE_STMT
 IF_STMT -> if (COMPARISON_STMT) BLOCK
 ELSE_IF_STMT -> else_if (COMPARISON_STMT) BLOCK NEW_ELSE_IF
 NEW_ELSE_IF -> ELSE_IF_STMT | /eps
 ELSE_STMT -> else BLOCK
 TYPE -> int | integer | /eps
 COMPARISON_STMT -> NUMORID COMPARISON_OP NUMORID
 ASSIGNMENT -> TYPE ASSIGN ;
 ASSIGN -> ASSIGN' IDENTIFIER = ASSIGNED
 ASSIGN' -> IDENTIFIER = ASSIGNED , ASSIGN' | /eps
 ASSIGNED -> NUMORID ASSIGNED'
 ASSIGNED' -> ARITHOP NUMORID ASSIGNED' | /eps
 NUMORID -> NUMBER | IDENTIDIFER
 PRINT -> print_line (" STRING ") ;
 STRING -> LETTER STRING'
 STRING' -> LETTER STRING' | /eps
 NUMBER -> DIGIT NUMBER'
 NUMBER' -> DIGIT NUMBER' | /eps
 COMPARISON_OP -> > | < | == | != | <= | >=
 ARITHOP -> + | - | / | *
 INCREMENTALOP -> ++ | /eps
 DISPLAY -> display (" string ") ;

FOR_STMT -> for (ASSIGNMENT ; COMPARISON_STMT ; IDENTIFIER) BLOCK

WHILE_STMT -> while (COMPARISON_STMT) BLOCK

First Set	$\text{First}(\text{DIGIT}) = \{0, \dots, 9\}$
$\text{First}(\text{PROGRAM}) = \{\text{Program}\}$	$\text{First}(\text{IDENTIFIER}) = \{a, \dots, z, \$\}$ $\text{First}(\text{LETTER}) = \{a, \dots, z, A, \dots, Z\}$
$\text{First}(\text{STARTCHAR}) = \{a, \dots, z, \$\}$	$\text{First}(\text{RESTCHAR}) = \{a, \dots, z, 0, \dots, 9, \$, ., -, A, \dots, Z\}$
$\text{First}(\text{POSSIBLECHAR}) = \{a, \dots, z, 0, \dots, 9, \$, ., -, A, \dots, Z\}$	$\text{First}(\text{BLOCK}) = \{\text{begin}\}$
$\text{First}(\text{RESTCHAR}') = \{a, \dots, z, 0, \dots, 9, \$, ., -, A, \dots, Z, \epsilon\}$	$\text{First}(\text{TYPE}) = \{\text{integer}, \text{int}, \epsilon\}$
$\text{First}(\text{STATEMENT}) = \{\text{if}, a, \dots, z, \$, \text{print_line}, \text{display}, \text{for}, \text{while}, \text{int}, \text{integer}\}$	
$\text{First}(\text{STMT}) = \{\text{if}, a, \dots, z, \$, \text{print_line}, \text{display}, \text{for}, \text{while}, \text{break}, \text{int}, \text{integer}, \epsilon\}$	
$\text{First}(\text{IF_BLOCK}) = \{\text{if}\}$	$\text{First}(\text{IF_STMT}) = \{\text{if}\}$ $\text{First}(\text{ELSE_IF_STMT}) = \{\text{else_if}\}$
$\text{First}(\text{NEW_ELSE_IF_STMT}) = \{\text{else_if}, \epsilon\}$	$\text{First}(\text{ELSE_STMT}) = \{\text{else}\}$
$\text{First}(\text{COMPARISON_STMT}) = \{a, \dots, z, A, \dots, Z, 0, \dots, 9, \$\}$	$\text{First}(\text{ASSIGNMENT}) = \{a, \dots, z, \$, \text{int}, \text{integer}\}$
$\text{First}(\text{ASSIGN}) = \{a, \dots, z, \$, A, \dots, Z\}$	$\text{First}(\text{ASSIGN}') = \{a, \dots, z, \$, \epsilon, A, \dots, Z\}$
$\text{First}(\text{ASSIGNED}) = \{0, \dots, 9, a, \dots, z, \$, A, \dots, Z\}$	$\text{First}(\text{ASSIGNED}') = \{+, -, *, /, \epsilon\}$
$\text{First}(\text{PRINT}) = \{\text{print_line}\}$	$\text{First}(\text{NUMBER}) = \{0, \dots, 9\}$ $\text{First}(\text{NUMBER}') = \{0, \dots, 9, \epsilon\}$
$\text{First}(\text{STRING}) = \{a, \dots, z, A, \dots, Z\}$	$\text{First}(\text{STRING}') = \{a, \dots, z, A, \dots, Z, \epsilon\}$
$\text{First}(\text{COMPARISON_OP}) = \{<, >, =, !=, <=, >=\}$	$\text{First}(\text{ARITHOP}) = \{+, -, *, /\}$
$\text{First}(\text{INCREMENTAL_OP}) = \{++, \epsilon\}$	$\text{First}(\text{DISPLAY}) = \{\text{display}\}$ $\text{First}(\text{FOR_STMT}) = \{\text{for}\}$ $\text{First}(\text{WHILE_STMT}) = \{\text{while}\}$

Follow Set

Follow (PROPERTY) = { \$ }

Follow (IDENTIFIER) = { begin, \$, a...Z, ' , = , < , > , <= , != , >= , <= , + , - , * , / }

Follow (STARTCHAR) = { \$, a...Z, 0...9, . , - }

Follow (LETTER) = { \$, a...Z, 0...9, . , - , begin,) , ' , = , < , > , <= , != , >= , <= , + , - , * , / , ++ }

Follow (DIGIT) = { \$, a...Z, 0...9, . , - , begin,) , ' , = , < , > , <= , != , >= , <= , + , - , * , / , ++ }

Follow (RESCCHAR) = { \$, a...Z, begin,) , ' , = , < , > , <= , != , >= , <= , + , - , * , / , ++ }

Follow (POSSIBLECHAR) = { \$, a...Z, 0...9, . , - , begin,) , ' , = , < , > , <= , != , >= , <= , + , - , * , / , ++ }

Follow (RESCCHAR') = { \$, a...Z, begin,) , ' , = , < , > , <= , != , >= , <= , + , - , * , / , ++ }

Follow (BLOCK) = { \$, a...Z, end, display, for, while, break, if, else-if, else, int, integer, print_line, \$ }

Follow (STATEMENT) = { end } Follow (START) = { end }

Follow (IF-BLOCK) = { \$, a...Z, end, display, for, while, break, if, int, integer, print_line }

Follow (IF-START) = { \$, a...Z, end, display, for, while, break, if, int, integer, print_line, else-if, else }

Follow (ELSE-IF-START) = { \$, a...Z, end, display, for, while, break, if, int, integer, print_line, else }

Follow (NEW-ELSE-IF) = { \$, a...Z, end, display, for, while, break, if, int, integer, print_line, else }

Follow (ELSE-START) = { \$, a...Z, end, display, for, while, break, if, int, integer, print_line }

Follow (COMPARISON-START) = { , ; } Follow (TYPE) = { \$, a...Z }

Follow (ASSIGNMENT) = { \$, a...Z, end, display, for, while, break, int, integer, ; , print_line }

Follow (ASSIGN) = { ; } Follow (ASSIGNED) = { \$, a...Z }

Follow (ASSIGNED) = { ; , } Follow (ASSIGNED) = { ; , }

Follow (PRINT) = { \$, a...Z, end, display, for, while, break, int, print_line }

Follow (NUMORD) = { \$, a...Z,) , ' , < , > , <= , >= , != , = , + , - , * , / }

Follow (NUMBER) = { \$, a...Z,) , ' , < , > , <= , >= , != , = , + , - , * , / }

Follow (NUMBER') = { \$, a...Z,) , ' , < , > , <= , >= , != , = , + , - , * , / }

Follow (STRING) = { " } Follow (STRING') = { " } Follow (COMPARISON-OP) = { \$, a...Z, 0...9 }

Follow (ARITH OP) = { \$, a...Z, 0...9 }

Follow (INCREMENTAL OP) = { \$, a...Z,) , begin,) , ' , = , < , > , <= , >= , != , = , + , - , * , / }

Follow (DISPLAY) = { \$, a...Z, end, display, for, while, break, if, int, integer, print_line }

Follow (FOR-START) = { \$, a...Z, end, display, for, while, break, if, int, integer, print_line }

Follow (WHILE-START) = { \$, a...Z, end, display, for, while, break, if, int, integer, print_line }