**SSN COLLEGE OF ENGINEERING, KALAVAKKAM**

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**

**UCS1602 - Compiler Design Programming**

**Assignment-6**

**Syntax checker using LEX and YACC**

**Name :**  Rahul Ram M

**Reg no. :** 185001121

**CODE:**

**checker.l:**

%{

#include <stdlib.h>

#include <stdio.h>

#include "y.tab.h"

void yyerror(char \*s);

extern int yylval;

int lno = 0;

char\* t = "test.c";

%}

%%

[ \t]+ ;

\n {lno++;}

int|float|char|double {return DATATYPE;}

while {return WHILE;}

if {return IF;}

else {return ELSE;}

for {return FOR;}

[0-9]+ {yylval = atoi(yytext); return NUMBER;}

[0-9]+\.\*[0-9]\* {yylval = atoi(yytext); return NUMBER;}

["].+["] {return STRING;}

[a-zA-Z\_]+[0-9]\*? {return VARIABLE;}

[,=;] {return yytext[0];}

"<"|"<="|">"|">="|"=="|"!=" {return RELATIONAL;}

"+"|"-"|"\*"|"/" {return ARITH;}

"++"|"--" {return UNARY;}

"(" {return \*yytext;}

")" {return \*yytext;}

"{" {return \*yytext;}

"}" {return \*yytext;}

. {yyerror(yytext);}

%%

int yywrap (void) {

return 1;

}

void yyerror(char \*s)

{

printf("%s:line:%d:syntax error\n",t,lno);

exit(1);

}

int main()

{

FILE \*fp;

fp = fopen(t,"r");

if (fp == NULL)

{

printf("File not found error\n");

exit(0);

}

yyin = fp;

yyparse();

printf("Syntax Correct!\n");

fclose(fp);

return 0;

}

**checker.y:**

%{

#include <stdio.h>

#include <stdlib.h>

#include <ctype.h>

int yylex(void);

#include "y.tab.h"

%}

%token NUMBER STRING VARIABLE RELATIONAL WHILE FOR ARITH UNARY DATATYPE IF ELSE

%%

PROGRAM:LINE

LINE :LINE STATEMENT| STATEMENT

STATEMENT: DATATYPE STATEMENT\_LIST ';'

|STATEMENT\_LIST ';'

|CONDITION\_ST

STATEMENT\_LIST : STATEMENT\_LIST ',' VAR | VAR

VAR :VARIABLE | EXPR

EXPR:VARIABLE '=' ASSIGNMENT\_EXP | VARIABLE UNARY | VARIABLE '=' ARITH ASSIGNMENT\_EXP

ASSIGNMENT\_EXP : VARIABLE ARITH ASSIGNMENT\_EXP

|NUMBER ARITH ASSIGNMENT\_EXP

|VARIABLE UNARY

|VARIABLE

| NUMBER

| STRING

CONDITION\_ST : WHILE '(' CONDITION\_EXP ')'

|WHILE '(' CONDITION\_EXP ')' '{' LINE '}'

|IF '(' CONDITION\_EXP ')' LINE ELSE LINE

|IF '(' CONDITION\_EXP ')' '{' LINE '}' ELSE '{' LINE '}'

|IF '(' CONDITION\_EXP ')' '{' '}' ELSE '{' LINE '}'

|IF '(' CONDITION\_EXP ')' '{' LINE '}'

|IF '(' CONDITION\_EXP ')' LINE

|FOR '('DATATYPE VARIABLE '=' NUMBER ';' CONDITION\_EXP ';' EXPR ')' '{' LINE '}'

|FOR '(' DATATYPE VARIABLE '=' NUMBER ';' CONDITION\_EXP ';' EXPR ')'

|FOR '(' VARIABLE '=' NUMBER ';' CONDITION\_EXP ';' EXPR ')'

CONDITION\_EXP : VARIABLE RELATIONAL CONDITION\_EXP

| NUMBER RELATIONAL CONDITION\_EXP

| VARIABLE

| NUMBER

%%

**Sample I/O:**

**Without syntax error:**

**test.c:**

int a = 10, b;

b = 5;

for(int j = 0; j < 5; j++)

{

b=b+1;

}

while(b < 20)

{

b++;

}

**Output:**

Syntax Correct!

**With Syntax error:**

**test.c:**

int a = 10, b;

b = 5;

for(int j = 0; j < 5; j++)

{

b=b+1;

}

while(b < 20)

{

b++

}

**Output:**

test.c:line:9:syntax error

**Learning Outcomes:**

This assignment helped me to

1. Understand the implementation of syntax checker using LEX and YACC.

2. Understand the Grammar used to check the syntax.