/\* AIM : Implement YACC for Subset of C (for loop)

NAME : Gauri Somavanshi

ROLL NO:B4280

DIV:B

------------------------------------------------------------------------------------------------------------ \*/

**forloop.l**

%{

#include <stdio.h>

#include "y.tab.h"

%}

variable (\_)\*[a-zA-Z]([a-zA-Z]|[0-9]|\_)\*

whitespace " "|\n|\t

%%

{whitespace} {} //no action

for {return TOKFOR;}

"(" {return OPENBRACKET;}

")" {return CLOSEBRACKET;}

{variable} {return VARIABLE;}

"=" {return EQUALOP;}

"\*"|"/" {return BINARYMULARITHOP;}

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

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

"<"|">"|"<="|">=" {return RELOP;}

";" {return DELIM;}

[0-9]+ {return DIGIT;}

"{" {return TOKCURLYOPEN;}

"}" {return TOKCURLYCLOSE;}

%%

int main() {

char filename[20];

printf("Enter source file name: ");

scanf("%s",filename);

yyin = fopen(filename,"r");

yyparse();

}

**forloop.y**

%{

#include<stdio.h>

%}

%token TOKCURLYOPEN TOKCURLYCLOSE TOKFOR DELIM VARIABLE DIGIT

%left EQUALOP

%left RELOP

%left BINARYADDARITHOP

%left BINARYMULARITHOP

%left UNARYARITHOP

%left OPENBRACKET CLOSEBRACKET

%%

lines: lines line

| line

;

line: forloop { printf("For loop syntax OK\n"); }

| forloop TOKCURLYOPEN line TOKCURLYCLOSE { printf("For loop syntax OK\n"); }

| forloop DELIM { printf("For loop syntax OK\n"); }

| expr DELIM

;

expr: OPENBRACKET expr CLOSEBRACKET

| expr BINARYADDARITHOP expr

| expr BINARYMULARITHOP expr

| expr EQUALOP expr

| expr UNARYARITHOP

| UNARYARITHOP expr

| VARIABLE

| DIGIT

;

relexpr: relexpr RELOP expr

| OPENBRACKET relexpr CLOSEBRACKET

| VARIABLE

| DIGIT

;

forloop: TOKFOR OPENBRACKET expr DELIM relexpr DELIM expr CLOSEBRACKET

| TOKFOR OPENBRACKET DELIM relexpr DELIM expr CLOSEBRACKET

| TOKFOR OPENBRACKET expr DELIM DELIM expr CLOSEBRACKET

| TOKFOR OPENBRACKET expr DELIM relexpr DELIM CLOSEBRACKET

| TOKFOR OPENBRACKET expr DELIM DELIM CLOSEBRACKET

| TOKFOR OPENBRACKET DELIM relexpr DELIM CLOSEBRACKET

| TOKFOR OPENBRACKET DELIM DELIM expr CLOSEBRACKET

| TOKFOR OPENBRACKET DELIM DELIM CLOSEBRACKET

;

%%

**Input File:**

in.txt

for(i = 0; i < 16; i++) {

for (j = 0; j < 16; j++) {

randomNumber = randomNmber \* 100;

}

}

for(;;);

for(;;){}

for( j--; ) {

k--;

}

**Output:**

[comp138@comp138$]For loop in yacc]$ yacc -d forloop.y

[comp138@comp138$]For loop in yacc]$ lex forloop.l

[comp138@comp138$]For loop in yacc]$ cc lex.yy.c y.tab.c -lfl -ly

[comp138@comp138$]For loop in yacc]$ ./a.out

Enter source file name: in.txt

For loop syntax OK

For loop syntax OK

For loop syntax OK

syntax error