

Lab 4 : Write a program for syntax checking of control statements using LEX and YACC.

Control.l:

```
% {
#include<stdio.h>
#include "y.tab.h"
% }
L [A-Za-z]
D [0-9]
id {L}({L}|{D})*
%%
"if" {return IF;}
"else" {return ELSE;}
"for" {return FOR;}
"do" {return DO;}
"while" {return WHILE;}
"++" {return INC;}
"--" {return DEC;}
"||" {return OR;}
"&&" {return AND;}
"!" {return NOT;}
"switch" {return SWITCH;}
"case" {return CASE;}
"break" {return BREAK;}
"default" {return DEFAULT;}
[0-9]+(\.[0-9]+)? {return NUM;}
{id} {return id;}
"<|"<="|">|">="|"=="|"!=" {return relop;}
[-/;=+*,\(\)\{\}\:] {return yytext[0];}
[ ] {}
\n {}
%%
```

```
int yywrap()
```

```
{
return 1;
}
```

Control.y

```
% {
#include <stdio.h>
% }
%token id NUM OR AND NOT relop TRUE FALSE INC DEC IF ELSE DO WHILE uminu
s FOR SWITCH CASE BREAK DEFAULT
%right '='
%left '+' '-'
%left '*' '/'
%right '^'
%nonassoc uminus
%left OR
```

%left AND
%nonassoc NOT
%%

S1 : S1 S

| S

;

S : AS ';' {printf("Assignment statement accepted \n");}

|IFS {printf("If statement is accepted \n");}

|IFES {printf("If else statement is accepted\n");}

|WS {printf("While statement is accepted\n");}

|DWS {printf("Do while statement is accepted\n");}

|FORS {printf("For statement is accepted\n");}

|SS {printf("Switch statement is accepted");}

;

SS : SWITCH('E'){' CV '}

;

CV : CASE E ':' S1 BREAK ';'

| CASE E ':' S1 BREAK ';' CV

| CASE E ':' S1 BREAK ';' DEFAULT ':' S1

;

AS : id '=' E

;

E : E '+' E

|E '-' E

|E '*' E

|E '/' E

|E '^' E

| '-' E %prec uminus

|id

|NUM

;

IFS: IF('BE'){'S1'}

;

BE : BE OR BE

| BE AND BE

| NOT BE

|id relop id

|TRUE

|FALSE

;

IFES : IF('BE'){'S1'}ELSE{'S1'}

;

```

WS : WHILE '('BE')' '{S1}'
    ;

DWS : DO '{S1}' WHILE '('BE')";'
    ;

FORS : FOR '('IS';'BE';'MS')' '{S1}'
    ;

IS : AS
    | IS ',' AS
    ;

MS : IS
    | id INC
    | INC id
    | id DEC
    | DEC id
    ;

%%

void main()
{
    yyparse();
}

int yyerror(char *msg)
{
    printf("%s\n",msg);
}

```

OUTPUT:

```

linux@linux-OptiPlex-7070: ~
linux@linux-OptiPlex-7070:~$ yacc -d syntax.y
linux@linux-OptiPlex-7070:~$ lex syntax.l
linux@linux-OptiPlex-7070:~$ gcc y.tab.c lex.yy.c
y.tab.c: In function 'yyparse':
y.tab.c:1306:16: warning: implicit declaration of function 'yylex' [-Wimplicit-function-declaration]
1306 |         yychar = yylex ();
      |                   ^~~~~~
y.tab.c:1469:7: warning: implicit declaration of function 'yyerror'; did you mean 'yyerrok'? [-Wimplicit-function-declaration]
1469 |         yyerror (YY_("syntax error"));
      |         ^~~~~~
      |         yyerrok
linux@linux-OptiPlex-7070:~$ ./a.out
if(x=y)
{
x=y;
Assignment statement accept
}
else
{
x=x+1;
Assignment statement accept
}
IF ELSE Statement accept
for(i=0; i<n; i++)
{
i=i+1;
Assignment statement accept
}
For statement accept
while(a<n)
{
a=a+1;
Assignment statement accept
}
While statement

```