Compiler Construction

Practical 7

19BCE248

DL2

AIM: To implement grammar rules for control statements, and Loop control.

Yacc file:

```
%{
#include<stdio.h>
#include <string.h>
%}
%token IF ELSE KEYWORD UN FOR ID NUM OPEN CLOSE GT LT EQ NTE GTE LTE AS SC OPENP CLOSEP WHILE OP
%%
START: OPEN ST CLOSE {printf("Done"); exit(0);}
ST : EXP STS | FORST STS | WHILEST STS | IFST STS | ELSE STS | ;
STS: ST  | OPEN ST CLOSE ST | SC STS ;
IFST: IF OPENP REL CLOSEP  ;
REL: Z1;
WHILEST : WHILE OPENP REL CLOSEP ;
FORST: FOR OPENP EXP1 EXP2 EXP3 CLOSEP ;
EXP1: EXP  | Z1 | SC | Z R Z SC;
EXP2 : Z1 SC  | ID AS Z OP Z SC ;
EXP3: ID UN  | Z | ID AS Z | ;
EXP: ID UN SC| ID AS Z OP Z1 SC | ID AS Z1 SC| KEYWORD ID AS Z1 SC| KEYWORD ID AS Z OP Z1 SC| KEYWORD ID SC| Z SC ;
Z1: Z| Z R Z;
Z:ID | NUM ;
```

```
R: GT | LT | EQ | NTE | GTE | LTE;
%%
int yyerror(){
printf("some error");
return 0;
}
int main(){
    yyparse();
    return 0;
}
```

Lex file:

```
%{
#include "prac7.tab.h"
%}
alpha [A-Za-z]
digit [0-9]
%%
"++"|"--" {return UN;}
"int"|"float"|"char"|"double"|"struct"|"do"|"printf"|"return" {return KEYWORD;}
"while" {return WHILE;}
("if") {return IF;}
"+"|"-"|"/"|"*" {return OP;}
("else") {return ELSE;}
("for") {return FOR;}
{digit}+ {return NUM;}
{alpha}({alpha}|{digit})* {return ID;}
```

```
("{") {return OPEN;}
("}") {return CLOSE;}
(">") {return GT;}
("<") {return LT;}
(">=") {return GTE;}
("<=") {return LTE;}
("!=") {return NTE;}
("==") {return EQ;}
("=") {return AS;}
(";") {return SC;}
("(") {return OPENP;}
(")") {return CLOSEP;}
("//").* {}
%%
int yywrap(){
return 0;
}
```

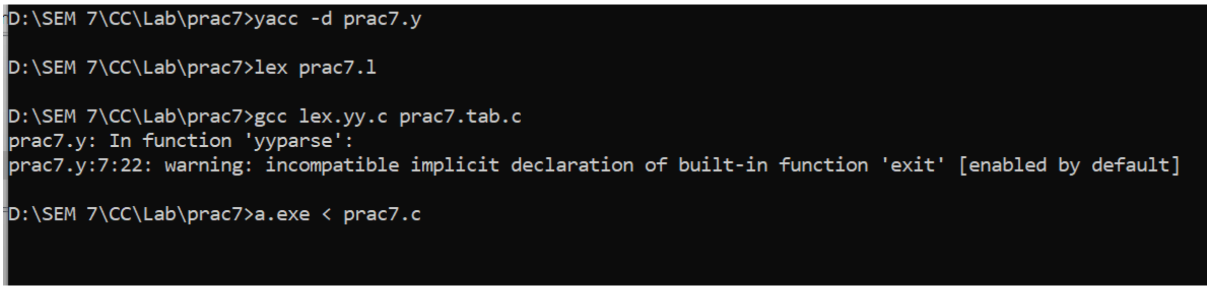
Test file :

```
{
        for(int i=0;i<n;i++){
                while(j<m){
                        if(x==10){
                                b++;
                        }else{
                                z++;
                        }
                }
```

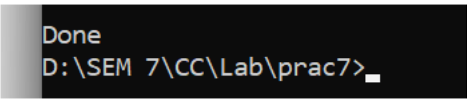
```
    if(a==b){
        while(a>0){
            a--;
        }
    }
    if(z==10)
        for(int i=0;i<n;i++)
            b++;
}
int a = 0;
if ( a < b )
{
    a = b;
}
else
{
    b = a;
}

for(;1;) ;
for(1;2;3);
for(int i=b+c<d;i<5;i++);
for(int i;i<5;i++);
//for(a<b;int i=b+c<d;i<5);
for(a<b;a=a+1; a=0)
for(int i=0;i<5;i++)
{
    y = 0;
    x=y+c;
```

```
        }


int i = 0;
        while ( i < 3)
        {
                y = y + 5;
        }


}
```

Output:



```
D:\SEM 7\CC\Lab\prac7>yacc -d prac7.y

D:\SEM 7\CC\Lab\prac7>lex prac7.l

D:\SEM 7\CC\Lab\prac7>gcc lex.yy.c prac7.tab.c
prac7.y: In function 'yyparse':
prac7.y:7:22: warning: incompatible implicit declaration of built-in function 'exit' [enabled by default]

D:\SEM 7\CC\Lab\prac7>a.exe < prac7.c
```



```
Done
D:\SEM 7\CC\Lab\prac7>
```