System Software Assignment-10

NAME:SOURABH PATEL
ADMISSION NO: U19CS082

1. Write a program for implementing a calculator for computing the given

expression using semantic rules of the YACC tool and LEX

Lexical Analyzer Source Code:

```
%{

#include<stdio.h>

#include "y.tab.h"

extern int yylval;

%}



%%

[0-9]+ {

          yylval=atoi(yytext);

          return NUMBER;

       }

[\t] ;

[\n] return 0;

. return yytext[0];

%%

int yywrap()
```

```
{

return 1;

}
```

Parser Source Code :

```
 %{

    #include<stdio.h>

    int flag=0;



%}

%token NUMBER



%left '+' '-'

%left '*' '/' '%'

%left '(' ')'

%%

ArithmeticExpression: E{

         printf("\nResult=%d\n",$$);

         return 0;

        };

E:E'+'E {$$=$1+$3;}

 |E'-'E {$$=$1-$3;}

 |E'*'E {$$=$1*$3;}

 |E'/'E {$$=$1/$3;}

 |E'%'E {$$=$1%$3;}
```

```
 |'('E')' {$$=$2;}

 | NUMBER {$$=$1;}

;

%%



void main()

{

   printf("\nEnter Any Arithmetic Expression which can have operations
Addition, Subtraction, Multiplication, Divison, Modulus and Round
brackets:\n");

   yyparse();

  if(flag==0)

   printf("\nEntered arithmetic expression is Valid\n\n");



}

void yyerror()

{

   printf("\nEntered arithmetic expression is Invalid\n\n");

   flag=1;

}
```

```
-VirtualBox:~/Desktop/a10/calc$ ./a.out
```

```
Enter Any Arithmetic Expression which can have operations Addition, Subtraction,
 Multiplication, Divison, Modulus and Round brackets:
10*5

Result=50

Entered arithmetic expression is Valid
```

2. Write a Yacc program to recognize validity of a nested ‘IF’ control statement and display levels of nesting in the nested if.

Lexical Analyzer Source Code:

```
%{
#include "y.tab.h"
%}

%%
"if" {return IF;}
[sS][0-9]* {return S;}
"<"|">"|"=="|"<="|">="|"!=" {return RELOP;}
[0-9]+ {return NUMBER;}
[a-z][a-zA-Z0-9_]* {return ID;}
\n {return NL;}
. {return yytext[0];}
%%
```

Parser Source Code :

```
%{
#include<stdio.h>
#include<stdlib.h>
int count=0;
%}

%token IF RELOP S NUMBER ID NL

%%
stmt: if_stmt NL {printf("No. of nested if statements=%d\n",count);exit(0);}
;
if_stmt : IF'('cond')''{'if_stmt'}' {count++;}
          |S
;
cond: x RELOP x
;
x:ID | NUMBER
;
%%

int yyerror(char *msg)
{
printf("the statement is invalid\n");
exit(0);
```

```
}

main()
{
printf("enter the statement\n");
yyparse();
}
```

```
-VirtualBox:~/Desktop/a10/if$ ./a.out
```

```
enter the statement
if(a>b){if(a>b){s}}
No. of nested if statements=2
```
