SS ASSIGNMENT – 10

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1. **Write a program for implementing a calculator for computing the given expression using semantic rules of the YACC tool and LEX.**

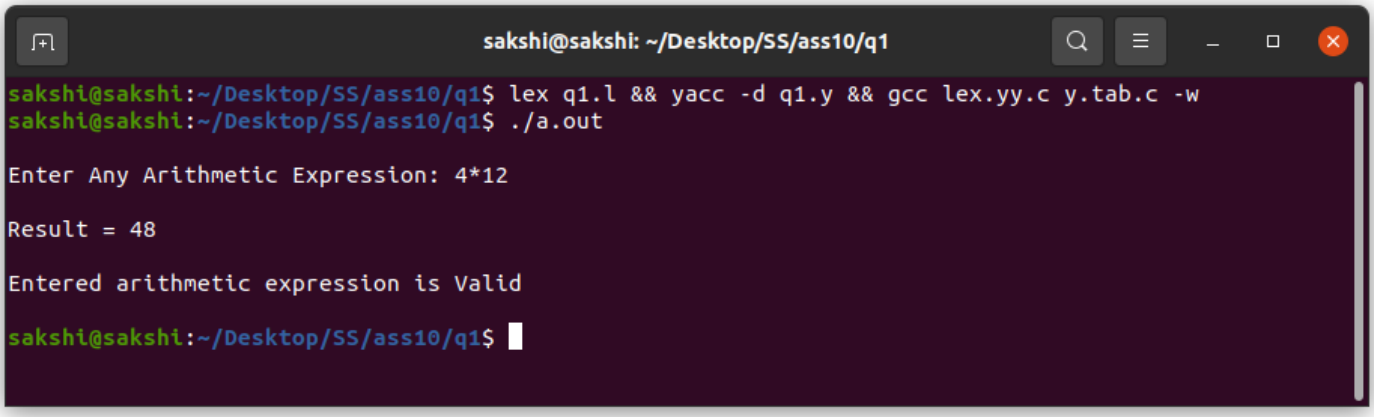
lex q1.l file:

```
%{
    /* Definition section */
    #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;
}
```

yacc q1.y file:

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

%token NUMBER
%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;}

| NUMBER {$$=$1;}
;
%%

//driver code
void main(){
    printf("\nEnter Any Arithmetic Expression: ");
    yyparse();
    if(flag==0)
    printf("\nEntered arithmetic expression is Valid\n\n");
}

void yyerror(){
    printf("\nEntered arithmetic expression is Invalid\n\n");
    flag=1;
}
```



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

lex q2.l file:

```
%{
    #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];}
%%
```

yacc q2.y file:

```
%{
    #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();
}
```