NATIONAL INSTITUTE OF TECHNOLOGY SILCHAR

Cachar, Assam

B.Tech. VIth Sem

Subject Code: CS-316

Subject Name: Compiler Design Lab

Submitted By:

Name : Subhojit Ghimire

Sch. Id. : 1912160

Branch : CSE – B

1. Write a yacc program to evaluate an arithmetic expression involving +, -, ×, ÷.

➔ **CODE:**

LEX (lab5_1.l)

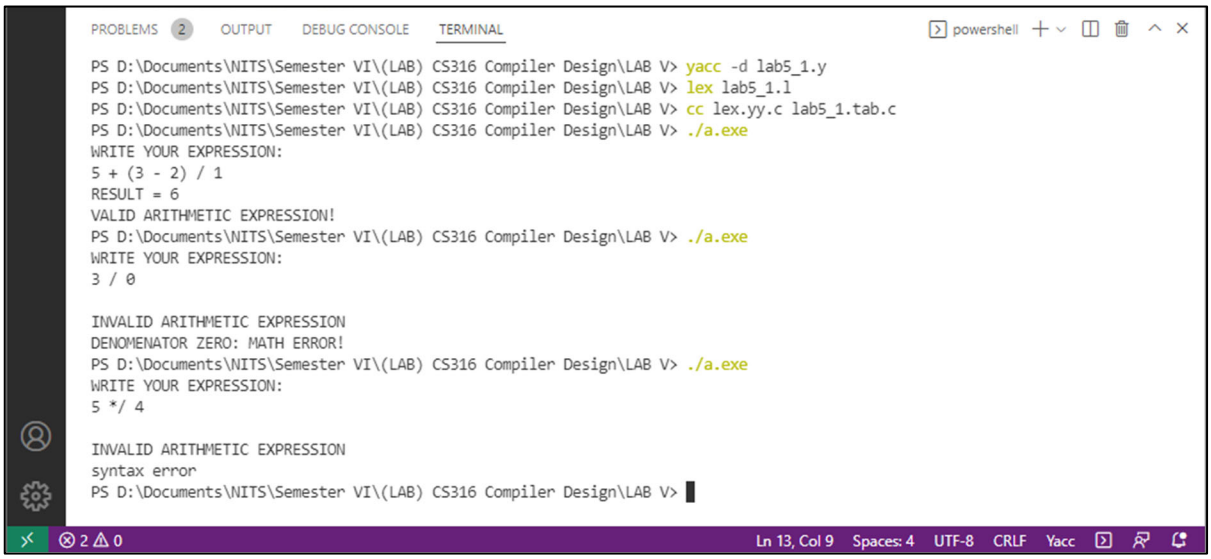
```
%{
    #include "lab5_1.tab.h"
    extern int yylval;
%}

%%
[0-9]+ {
    yylval = atoi (yytext);
    return NUM;
}
[a-zA-Z]+ {return ID;}
[+] {return '+';}
[-] {return '-';}
[*] {return '*';}
[/] { return '/';}
[ \t]+ {;}
\n {return 0;}
. {return yytext[0];}
%%

int yywrap(){
    return 1;
}
```

YACC (lab5_1.y)

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

%token NUM ID
%left '-''+'
%right '*''/'

%%
start: exp {
    if (!flag)
        printf ("RESULT = %d\n", $$);
    return 0;
}
exp:exp'+'exp {$$ = $1 + $3;}
|exp'-'exp {$$ = $1 - $3;}
```

```
|exp'*'exp {$$ = $1 * $3;}
|exp'/'exp {
    if ($3 == 0)
        yyerror ("DENOMENATOR ZERO: MATH ERROR!");
    else
        $$ = $1 / $3;
}
|'-' NUM {$$ = -$2;}
|'-' ID {$$ = -$2;}
|'('exp')' {$$ = $2;}
|NUM {$$ = $1;}
|ID {$$ = $1;};
%%

int main () {
    printf ("WRITE YOUR EXPRESSION:\n");
    yyparse ();
    if (flag == 0)
        printf ("VALID ARITHMETIC EXPRESSION!");
    return 0;
}

int yyerror (char *str) {
    printf ("\nINVALID ARITHMETIC EXPRESSION\n%s", str);
    flag = 1;
    return 0;
}
```

OUTPUT:



2. Write a yacc program to recognise nested "IF" control statements, and display the number of levels of listing.

➔ **CODE:**

LEX (lab5_2.l)

```
%{
    #include "lab5_2.tab.h"
%}

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

int yywrap() {
    return 1;
}
```

YACC (lab5_2.y)

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

%token IF RELOP SS NUMBER ID

%%
start: ifStatement {
    printf ("NUMBER OF NESTED \"IF\" STATEMENTS = %d\n", count);
    return 0;
}
ifStatement: IF'('cond')''{'ifStatement'}' {++count;}
|SS {;}
cond: x RELOP x {;}
x: ID|NUMBER {;};
%%

int main () {
    printf ("ENTER THE STATEMENT:\n");
```

```
    yyparse ();
    return 0;
}

int yyerror (char *str) {
    printf ("INVALID EXPRESSION!");
    exit (0);
}
```

OUTPUT: