NATIONAL INSTITUTE OF TECHNOLOGY SILCHAR

Cachar, Assam

B.Tech. VIth Sem

Subject Code: CS-316

Subject Name: Compiler Design Lab

Submitted By:

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Branch : CSE – B

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

➔ **CODE:**

LEX

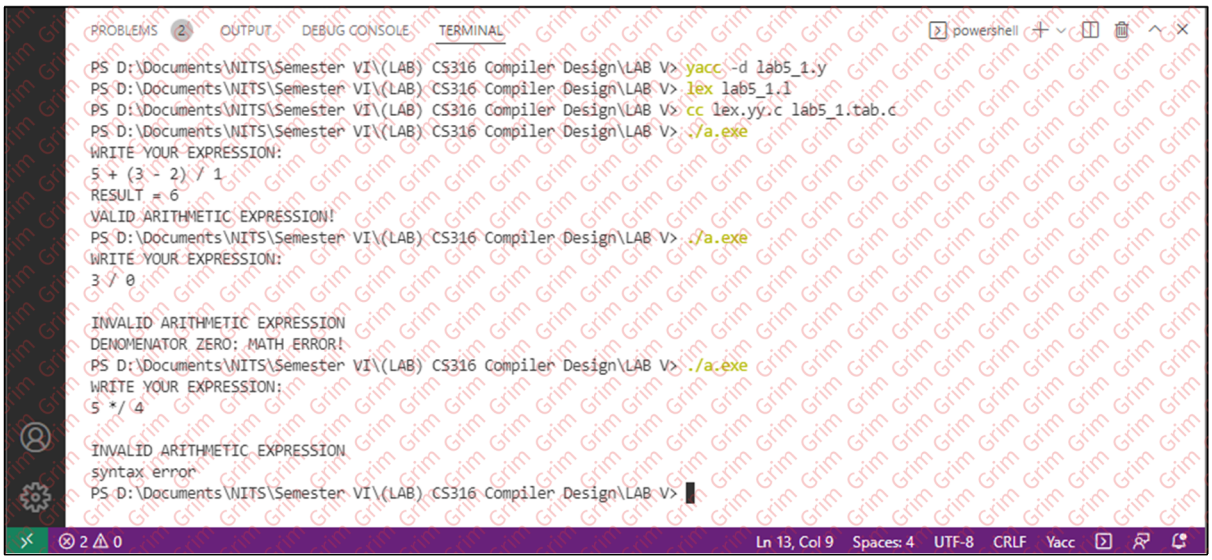
```
%{
    #include "lab5_1.tab.h"
    extern int yylval;
%}

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

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

YACC

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

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

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

```
|E'*'E {$$ = $1 * $3;}
|E'/'E {$$ = $1 / $3;}
|'-' NUMBER {$$ = -$2;}
|'-' ID {$$ = -$2;}
|'('E')' {$$ = $2;}
|NUMBER {$$ = $1;}
|ID {$$ = $1;};
%%

int main () {
    printf ("enter your expression:\n");
    yyparse ();
    if (flag == 0)
        printf ("valid!");
    return 0;
}

int yyerror () {
    printf ("\ninvalid\n");
    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

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

%%
"if" {return IF;}
[sS][0-9]* {return S;}
"<"|">"|"=="|"!="|"<="|">=" {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

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

%token IF RELOP S NUMBER ID

%%
statement: if_stat {
    printf ("total nested if statements: %d\n", count);
    return 0;
}
if_stat: IF'('cond')''{'if_stat'}' {count++;}
|S {;}
cond: x RELOP x {;}
x: ID|NUMBER {;};
%%

int main () {
    printf ("write statement:\n");
```

```
    yyparse ();
    return 0;
}

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

OUTPUT: