# CD LAB 4 Calculator for Arithmetic Expressions using YACC

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**BE E 66 (BATCH 3)**

**yacc.y**

```
%{
#include <stdio.h>
#include <math.h>
void yyerror(char const *s){printf("Error");}
%}

%union{ float d; }
%left '+' '-'
%left '*' '/'
%right '^'
%nonassoc UN
%type <d> E
%token <d> NUM
%token NL SINE LOG

%%

S : S E NL  {printf("Ans is %f\n",$2);}
          |
          ;

E : E '+' E { $$ = $1 + $3; }
          | E '-' E { $$ = $1 - $3; }
          | E '*' E { $$ = $1 * $3; }
          | E '/' E { $$ = $1 / $3; }
          | '-' E %prec UN {$$ = -1 * $2;}
          | E '^' E {$$ = pow($1,$3);}
          | SINE '(' E ')' {$$ = sin($3);}
          | LOG '(' E ')' {$$ = log($3);}
          | NUM
          ;
%%

int main(){
          stdin=fopen("in","r");
          yyparse();
          return 0;
}
```

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**lex.l**

```
%{
#include <stdio.h>
#include <ctype.h>
#include "y.tab.h"
%}

NUM [0-9]+
WHITESPACE \t

%%
{NUM}|({NUM}"."{NUM}) { yylval.d = atof(yytext); return NUM;}
\n {return NL;}
"+"|"-"|"*"|"/"|"^"|"("|")" {return yytext[0];}
"sin" {return SINE;}
"log" {return LOG;}
{WHITESPACE}
%%
```

**INPUT**

```
5+5
6+4
4+5
-4*2
5^2
sin(90)
log(4)
```

**OUTPUT**

```
bhushan@bhushan-desktop:~/LAB/CD/4$ yacc -d yac.y
bhushan@bhushan-desktop:~/LAB/CD/4$ lex lex.l
bhushan@bhushan-desktop:~/LAB/CD/4$ gcc lex.yy.c y.tab.c -ll -lm -o l
bhushan@bhushan-desktop:~/LAB/CD/4$ ./l
Ans is 10.000000
Ans is 10.000000
Ans is 9.000000
Ans is -8.000000
Ans is 25.000000
Ans is 0.893997
Ans is 1.386294
```