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Lab-5

Title: To write a program in YACC for parser generation.

Code:

```
%{
#include <ctype.h>
#include <stdio.h>

#define YYSTYPE double
int yylex();
int yyerror(const char *s);
%}

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

%%
lines:
      lines expr '\n' { printf("%g\n", $2); }
    | lines '\n'
    | /* empty */
    ;

expr:
      expr '+' expr { $$ = $1 + $3; }
    | expr '-' expr { $$ = $1 - $3; }
    | expr '*' expr { $$ = $1 * $3; }
    | expr '/' expr { $$ = $1 / $3; }
    | '(' expr ')'  { $$ = $2; }
    | '-' expr %prec UMINUS { $$ = -$2; }
    | NUMBER
    ;
%%
```

```c
int yylex() {
    int c;

    // skip whitespace except newline
    while ((c = getchar()) == ' ');

    if (c == '.' || isdigit(c)) {
        ungetc(c, stdin);
        scanf("%lf", &yylval);
        return NUMBER;
    }
    return c;
}

int yyerror(const char *s) {
    fprintf(stderr, "Error: %s\n", s);
    return 0;
}

int main() {
    return yyparse();
}
```

Output:

```
asecomputerlab@asecomputerlab-hp-prodesk-400-g7-micrtower-pc:~/Desktop/lab$ bison -d calc.y
asecomputerlab@asecomputerlab-hp-prodesk-400-g7-micrtower-pc:~/Desktop/lab$ gcc -o calc calc.tab.c -lm
asecomputerlab@asecomputerlab-hp-prodesk-400-g7-micrtower-pc:~/Desktop/lab$ ./calc
1 + 2 * 3
(4 + 5) / 3
-6 + 7
7
3
1
```