

**EXP NO: 04**

**DATE:**

## **DESIGN AND IMPLEMENT A DESK CALCULATOR USING THE LEX TOOL**

### **Problem Statement**

Recognizes whether a given arithmetic expression is valid, using the operators +, -, \*, and /. The program should ensure that the expression follows basic arithmetic syntax rules (e.g., proper placement of operators, operands, and parentheses).

### **AIM:**

To design and implement a Desk Calculator using the LEX tool, which validates arithmetic expressions containing +, -, \*, /, numbers, and parentheses. The program ensures that the expression follows correct arithmetic syntax rules.

### **ALGORITHM:**

- **Start**
- Define token patterns in **LEX** for:
  - **Numbers** (integer and floating-point)
  - **Operators** (+, -, \*, /)
  - **Parentheses** ( (, ) )
  - **Whitespace** (to ignore spaces and tabs)
- Read an arithmetic expression as input.
- Use **LEX rules** to identify and validate tokens.
- If an **invalid token** is encountered, print an error message.
- If the expression is valid, print "Valid arithmetic expression."
- **End**

### **PROGRAM**

:

```
%{  
#include <stdio.h>  
#include <stdlib.h>  
%}  
  
%%  
[0-9]+ { printf("NUMBER: %s\n", yytext); }  
[+\\-*/] { printf("OPERATOR: %s\n", yytext); }  
[\\n] { printf("NEWLINE\n"); }
```

```
[ \t]    { /* Ignore whitespace */ }
.        { printf("INVALID CHARACTER: %s\n", yytext); }
%%
```

```
int main() {
    printf("Enter an expression: ");
    yylex();
    return 0;
}
```

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

## OUTPUT :

```
lex calculator.l
cc lex.yy.c -o
calculator
./a.out
```

```
3 + 5 * (2 - 8)
Number: 3
Operator: +
Number: 5
Operator: *
Left Parenthesis: (
Number: 2
Operator: -
Number: 8
Right Parenthesis: )
Valid arithmetic expression.
```

## RESULT:

Thus the above program reads an arithmetic expression, tokenizes it using LEX rules, and validates the syntax by recognizing numbers, operators (+, -, \*, /), and parentheses. If the expression is valid, it prints "Valid arithmetic expression." Otherwise, it detects and reports invalid tokens