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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 */ }
```

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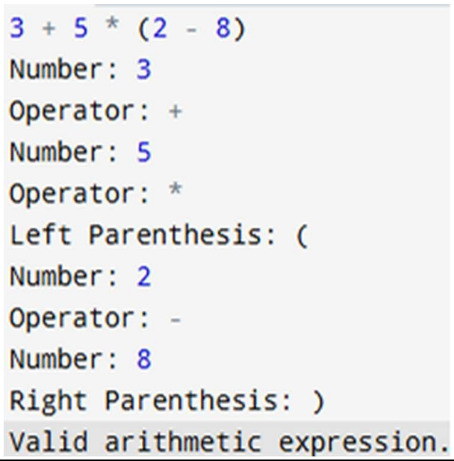
```
.        { printf("INVALID CHARACTER: %s\n", yytext); }
%%

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.
```

Implementation	
Output/Signature	

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

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