

**Exp No: 5**

**Date:**

## **DESIGN A DESK CALCULATOR USING LEX TOOL**

**AIM:**

To check whether the arithmetic expression using lex and yacc tool.

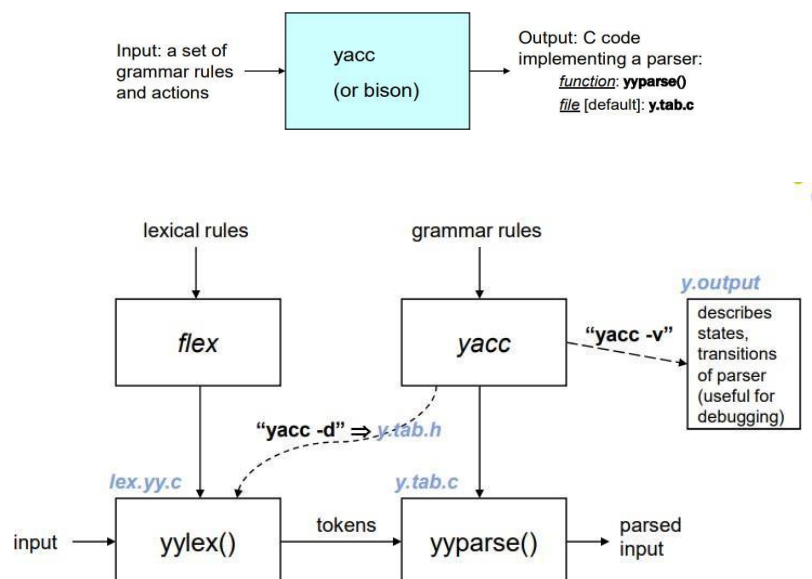
**ALGORITHM:**

- Using the flex tool, create lex and yacc files.
- In the C include section define the header files required.
- In the rules section define the REGEX expressions along with proper definitions.
- In the user defined section define yywrap() function.
- Declare the yacc file inside it in the C definitions section declare the header files required along with an integer variable valid with value assigned as 1.
- In the Yacc declarations declare the format token num id op.
- In the grammar rules section if the starting string is followed by assigning operator or identifier or number or operator followed by a number or open parenthesis followed by an identifier. The x could be an operator followed by an identifier or operator or no operator then declare that as valid expressions by making the valid stay in 1 itself.
- In the user definition section if the valid is 0 print as Invalid expression in yyerror() and define the main function.

## **LEX AND YACC WORKING:**

Parser generator:

- Takes a specification for a context-free grammar.
- Produces code for a parser.



## PROGRAM:

### cdlab5.l:

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

%%

[a-zA-Z_][a-zA-Z_0-9]* return id;

[0-9]+(\\.[0-9]*)?    return num;

[+/*]                return op;

.                    return yytext[0];

\\n                    return 0;

%%
```

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

### cdlab5.y:

```
% {

    #include<stdio.h>
    int yylex();
    int yyerror();
    int valid=1;

% }

%token num id op

%%

start : id '=' s ';'

s :    id x

    | num x

    | '-' num x

    | '(' s ')' x

    ;

x :    op s
```

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```

    | '-' s
    |
    ;
%%
int yyerror(){
    valid=0;
    printf("\nInvalid expression!\n");
    return 0;
}
int main(){
    printf("\nEnter the expression:\n");
    yyparse();
    if(valid){
        printf("\nValid expression!\n");
    }
}

```

### OUTPUT:

```

(kali㉿kali)-[~/Documents/cdlab]
$ vi cdlab5.y

(kali㉿kali)-[~/Documents/cdlab]
$ yacc -d cdlab5.y

(kali㉿kali)-[~/Documents/cdlab]
$ vi cdlab5.l

(kali㉿kali)-[~/Documents/cdlab]
$ lex cdlab5.l

(kali㉿kali)-[~/Documents/cdlab]
$ gcc lex.yy.c y.tab.c

(kali㉿kali)-[~/Documents/cdlab]
$ ./a.out

Enter the expression:
a=b

Invalid expression!

(kali㉿kali)-[~/Documents/cdlab]
$ ./a.out

Enter the expression:
a=b;

Valid expression!

```

### RESULT:

Thus, a program to check whether the arithmetic expression using lex and yacc tool is implemented.