Exp No: 5

DESIGN A DESK CALCULATOR USING LEX TOOL

AIM:

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

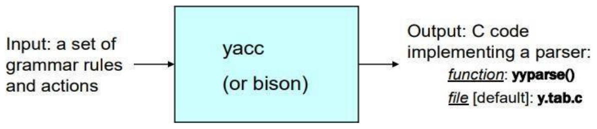
ALGORITHM:

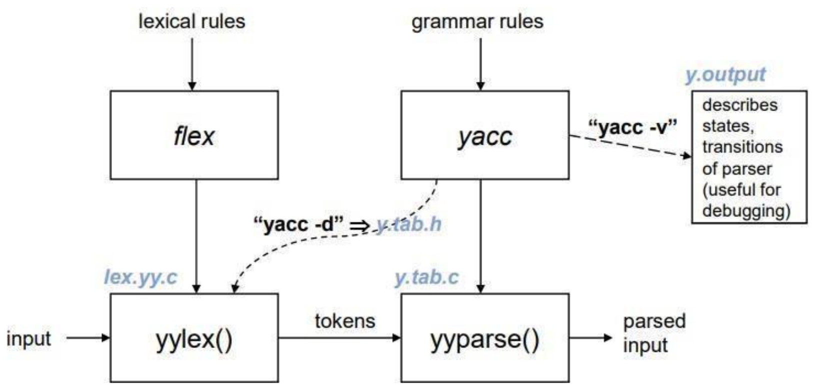
- Using the flex tool, create lex and yacc files.
- In the C include section define the header files required.
- In the rules section define the REGEX expressions along with proper definitions.
- In the user defined section define yywrap() function.
- Declare the yacc file inside it in the C definitions 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.


Input: a set of grammar rules and actions
yacc
(or bison)
Output: C code implementing a parser:
function: yyparse()
file [default]: y.tab.c



PROGRAM:

cdlab5.l:

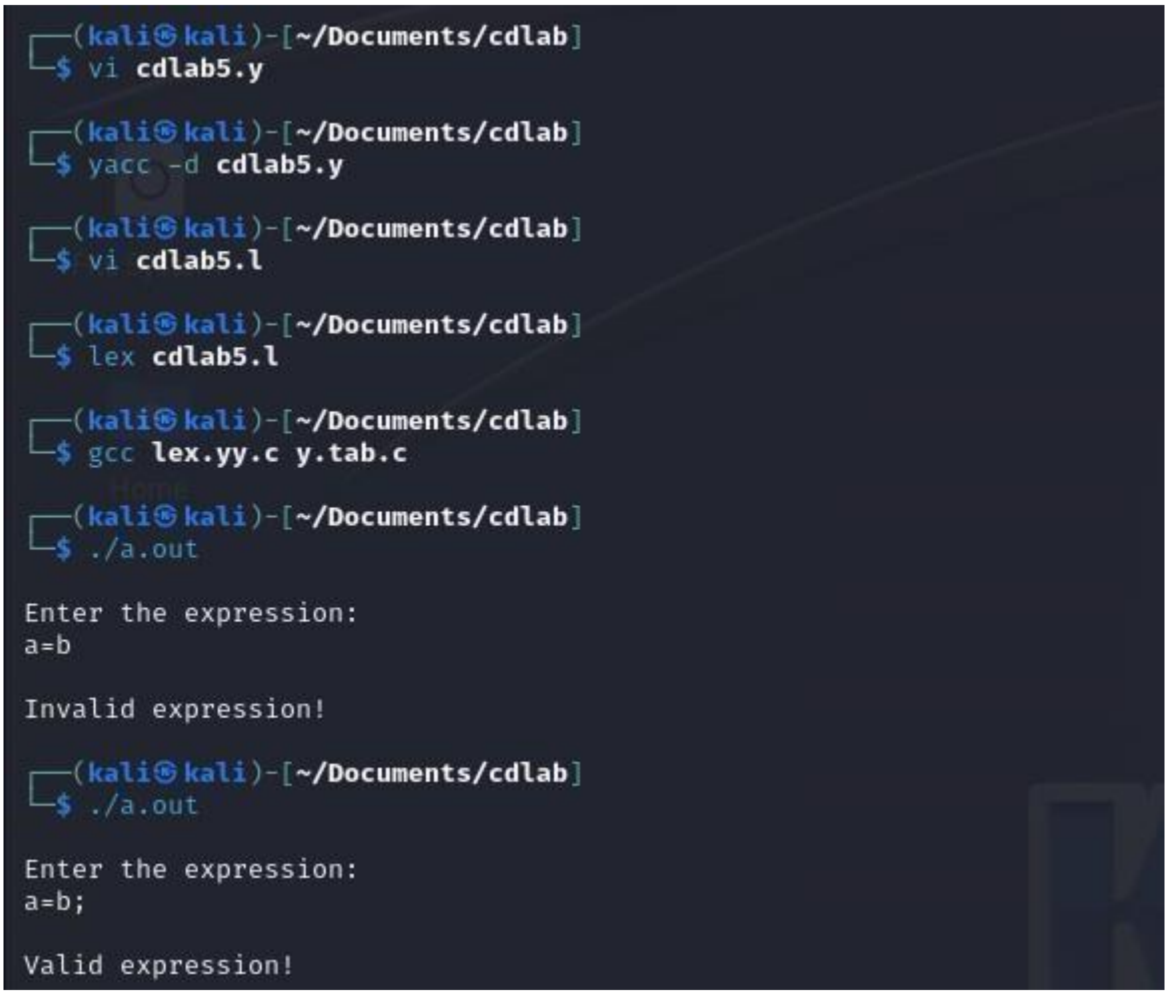
```
%{
    #include "y.tab.h"
%}

%%

[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
```

```
      | '-' 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.