Exp No: 5

Date:

DESIGN A DESK CALCULATOR USING LEX TOOL

AIM:

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

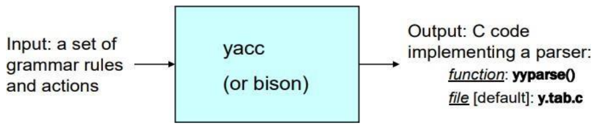
ALGORITHM:

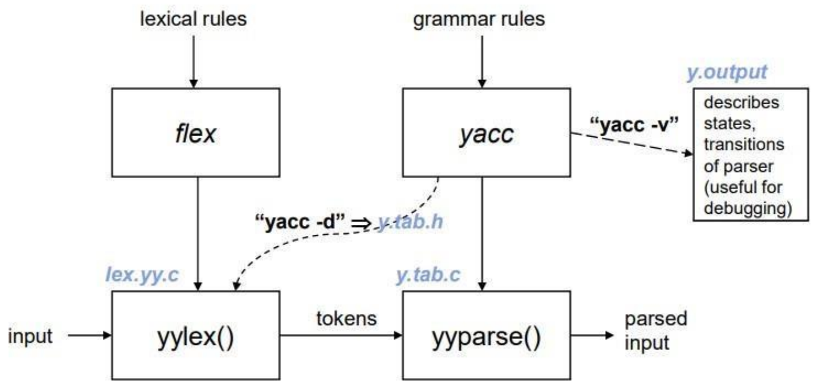
- Using the flex tool, create lex and yacc files.
- In the C include section define the header files required.
- In the rules section define the REGEX expressions along with proper definitions.
- In the user defined section define yywrap() function.
- Declare the yacc file inside it in the C definitions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


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



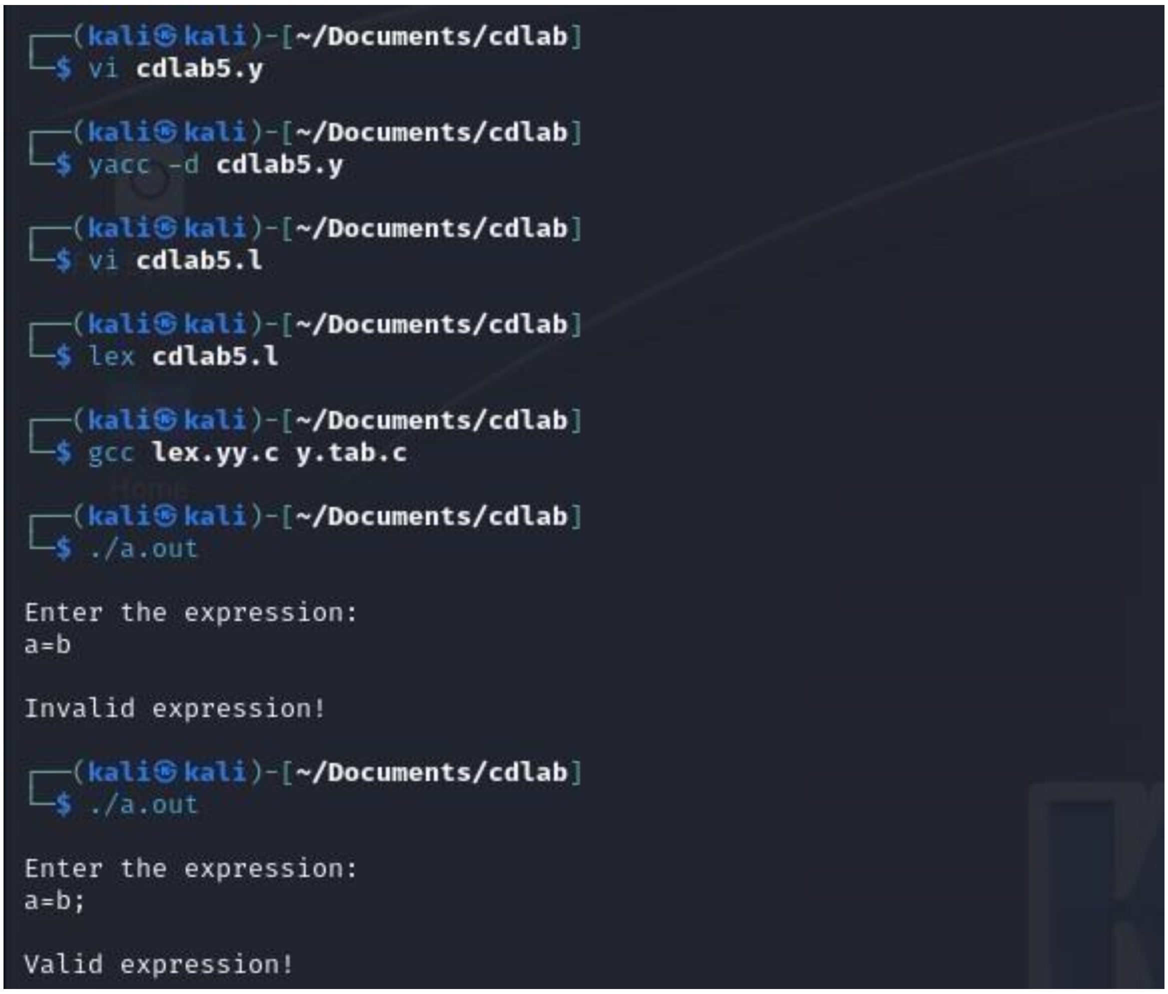
PROGRAM:

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
 ;

x :      op s
        | '-' 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.

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