D.Y. Patil College of Engineering,

Akurdi, Pune – 44Department of Information Technology

NAME: Aditya Somani

PRN: 71901204L ROLL:

T1851061

SL-5(Group'A')

Assignment no. 6

AIM:

To write a program for implementing a calculator for computing the given

expression using semantic rules of the YACC tool and LEX.

ALGORITHM:

Step1: A Yacc source program has three parts as follows:

Declarations %% translation rules %% supporting C

routines

Step2: Declarations Section: This section contains entries that:

i. Include standard I/O header file.

ii. Define global variables.

iii. Define the list rule as the place to start processing.

iv. Define the tokens used by the parser. v. Define the operators and their precedence.

Step3: Rules Section: The rules section defines the rules that parse the input stream.

Each rule of a grammar production and the associated semantic action.

Step4: Programs Section: The programs section contains the following subroutines.

Because these subroutines are included in this file, it is not necessary to use the yacc

library when processing this file.

Step5: Main- The required main program that calls the yyparse subroutine to start the program.

Step6: yyerror(s) -This error-handling subroutine only prints a syntax error

message.

Step7: yywrap -The wrap-up subroutine that returns a value of 1 when the end of input

occurs.

The calc.lex file contains include statements for standard input and output, as programmar

file information if we use the -d flag with the yacc command. The y.tab.h file contains

definitions for the tokens that the parser program uses.

Step8: calc.lex contains the rules to generate these tokens from the input stream.

PROGRAM CODE:

```
//Implementation of calculator using LEX
and YACC LEX PART:
%{
#include<stdio.h>
#include "y.tab.h"
extern int yylval;
%}
NUMBER [0-9]+|([0-9]*"."[0-9]+)
%%
{NUMBER} {
```

```
yylval=atoi(yytext);
return NUMBER;
}
[\t] ;
[\n] return 0;
. return yytext[0];
%%
int yywrap()

{
return 1;
}
```

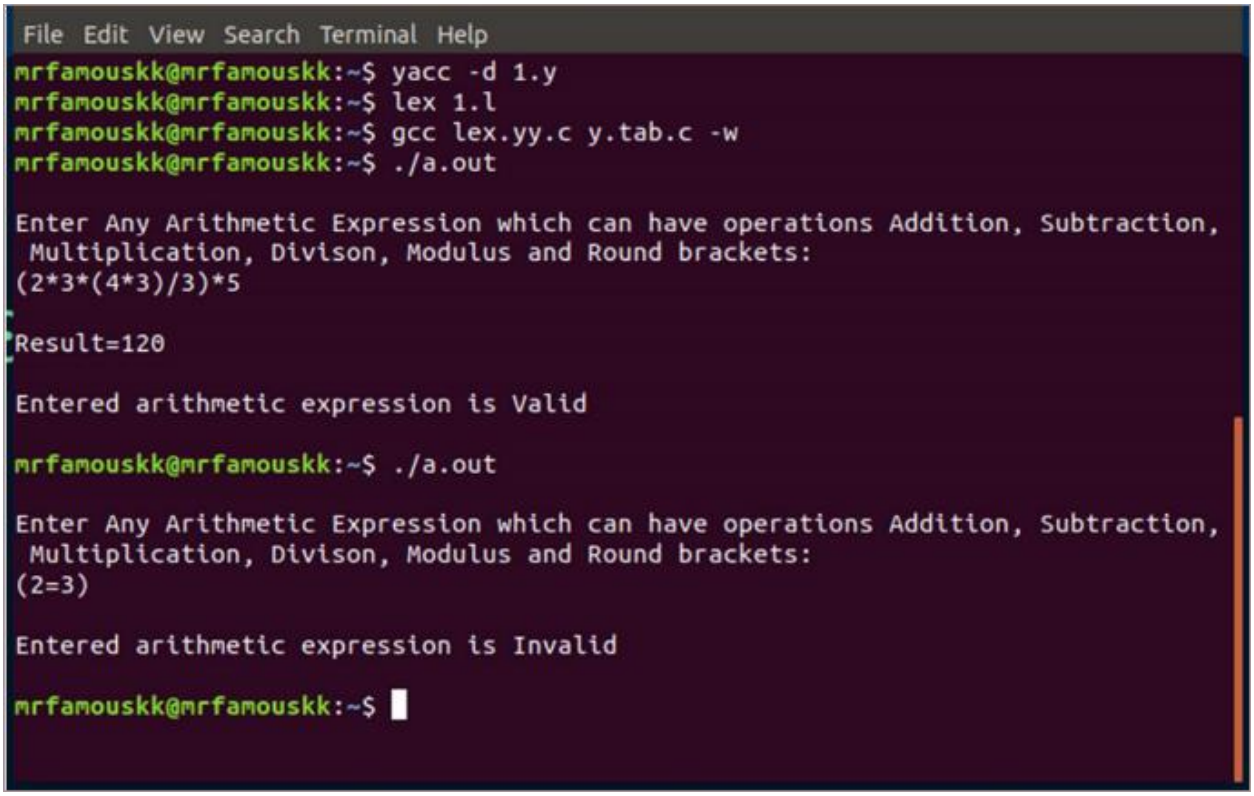
YACC PART:

```
%{
#include<stdio.h>
int flag=0;
%}
%token NUMBER
%left '+' '-'
%left '*' '/' '%'
%left '(' ')'
%%
ArithmeticExpression: E{ printf("\nResult=%d\n",$$);
```

```
return 0;
};
E:E'+'E {$$=$1+$3;}
|E'-'E {$$=$1-$3;}
|E'*'E {$$=$1*$3;}
|E'/'E {$$=$1/$3;}
|E'%'E {$$=$1%$3;}
|'('E')' {$$=$2;}
| NUMBER {$$=$1;}
;
%%

void main()
{
printf("\nEnter Any Arithmetic Expression which can have operations Addition, Subtraction,
Multiplication, Divison, Modulus and Round brackets:\n");
yyparse(); if(flag==0)
printf("\nEntered arithmetic expression is Valid\n\n");
}
void yyerror()
{
printf("\nEntered arithmetic expression is Invalid\n\n"); flag=1;
}
```

OUTPUT:



Conclusion: Program for basic Calculator is implemented successfully using LEX

and YAAC