

## Practical 2.

### Aim:

Analyze impact of storage format Implement calculator using operator precedence parsing for constant terms (using lex and yacc).

### Code:

1. Lex code: ***calculator.l***

```
%{
    #include<stdio.h>
    #include "y.tab.h"
    extern int yylval;
}%
%%

[0-9]+    {
            yylval=atoi(yytext);
            return NUMBER;
        }

[\\t] ;

[\\n] return 0;
. return yytext[0];
%%

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

## 2. Yacc code: **calculator.y**

```
%{
    #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;}
;

%%

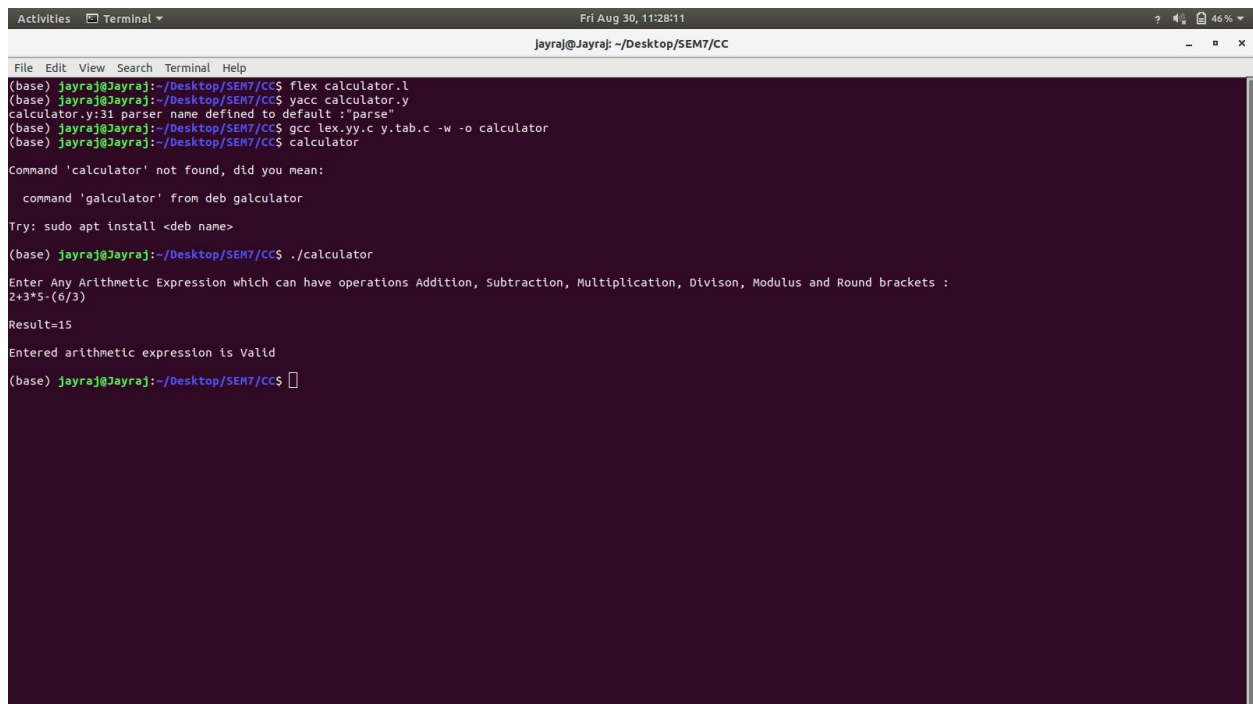
void main()
{
    printf("\nEnter Any Arithmetic Expression which can have operations
Addition, Subtraction, Multiplication, Divison, Modulus and Round brackets
:\n");
    yyparse();
    if(flag==0)
        printf("\nEntered arithmetic expression is Valid\n\n");
}

void yyerror()
{

```

```
printf("\nEntered arithmetic expression is Invalid\n\n");  
flag=1;  
}
```

## Input and Output



```
Activities Terminal Fri Aug 30, 11:28:11 jayraj@Jayraj: ~/Desktop/SEM7/CC  
File Edit View Search Terminal Help  
(base) jayraj@Jayraj:~/Desktop/SEM7/CC$ flex calculator.l  
(base) jayraj@Jayraj:~/Desktop/SEM7/CC$ yacc calculator.y  
calculator.y:31 parser name defined to default : "parse"  
(base) jayraj@Jayraj:~/Desktop/SEM7/CC$ gcc lex.yy.c y.tab.c -w -o calculator  
(base) jayraj@Jayraj:~/Desktop/SEM7/CC$ calculator  
Command 'calculator' not found, did you mean:  
  command 'galculator' from deb galculator  
Try: sudo apt install <deb name>  
(base) jayraj@Jayraj:~/Desktop/SEM7/CC$ ./calculator  
Enter Any Arithmetic Expression which can have operations Addition, Subtraction, Multiplication, Divison, Modulus and Round brackets :  
2+3*5-(6/3)  
Result=15  
Entered arithmetic expression is Valid  
(base) jayraj@Jayraj:~/Desktop/SEM7/CC$
```

```
Activities Terminal Fri Aug 30, 11:34:30 jayraj@Jayraj: ~/Desktop/SEM7/CC
File Edit View Search Terminal Help
(base) jayraj@Jayraj:~/Desktop/SEM7/CC$ flex calculator.l
(base) jayraj@Jayraj:~/Desktop/SEM7/CC$ yacc calculator.y
calculator.y:31 parser name defined to default : "parse"
(base) jayraj@Jayraj:~/Desktop/SEM7/CC$ gcc lex.yy.c y.tab.c -w -o calculator
(base) jayraj@Jayraj:~/Desktop/SEM7/CC$ ./calculator

Enter Any Arithmetic Expression :
9-8*2+5-9/3

Evaluated to =-5

Valid Expression

(base) jayraj@Jayraj:~/Desktop/SEM7/CC$ ./calculator

Enter Any Arithmetic Expression :
8*(9-8

Invalid Expression

(base) jayraj@Jayraj:~/Desktop/SEM7/CC$
```

## Analysis:

Here a simple calculator to perform arithmetic tasks such as addition, subtraction, division, multiplication can be created with the help of lexical analysis and Lex and syntax analysis in Yacc using the grammar defined in it.