

**Ex No: 5**

**Date:**

## RECOGNIZE AN ARITHMETIC EXPRESSION USING LEX AND YACC

**AIM:**

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

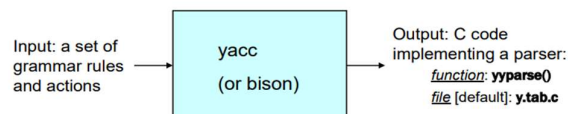
**ALGORITHM:**

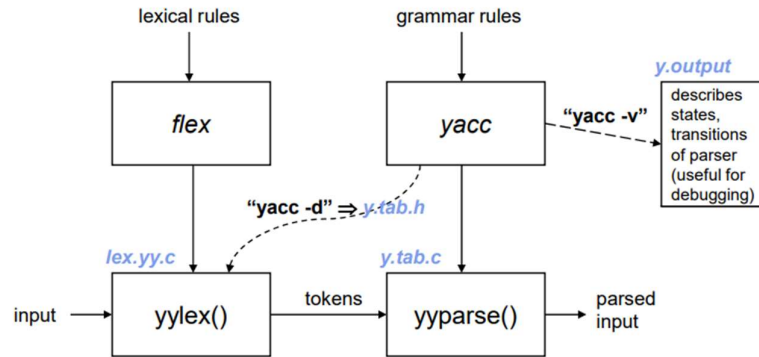
- Using the flex tool, create lex and yacc files.
- In the C include section define the header files required.
- In the rules section define the REGEX expressions along with proper definitions.
- In the user defined section define yywrap() function.
- Declare the yacc file inside it in the C definitions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

### validexp.l:

```

%{
#include<stdio.h>
#include "y.tab.h"
%}

%%
[a-zA-Z]+ return VARIABLE;
[0-9]+ return NUMBER;
[\t] ;
[\n] return 0;
. return yytext[0];
%%
int yywrap()
{
return 1;
}
  
```

### validexp.y:

```

%{
#include<stdio.h>
%}
%token NUMBER
%token VARIABLE

%left '+' '-'
%left '*' '/' '%'
  
```

```

%left '(' ')'
%%

S: VARIABLE '=' E {
    printf("\nEntered arithmetic expression is Valid\n\n");
    return 0;
}
E: E '+' E
  | E '-' E
  | E '*' E
  | E '/' E
  | E '%' E
  | '(' E ')'
  | NUMBER
  | VARIABLE
;
%%
void main()
{
    printf("\nEnter Any Arithmetic Expression which can have operations
Addition, Subtraction, Multiplication, Divison, Modulus and Round
brackets:\n");
    yyparse();
}
void yyerror()
{
    printf("\nEntered arithmetic expression is Invalid\n\n");
}

```

## OUTPUT:

```
root@thamizh-HP-Pavilion-Laptop-15-eg2xxx:/home/thamizh/Desktop/CD_Record/exp6# lex 288_exp6.l
root@thamizh-HP-Pavilion-Laptop-15-eg2xxx:/home/thamizh/Desktop/CD_Record/exp6# yacc -d 288_exp6.y
root@thamizh-HP-Pavilion-Laptop-15-eg2xxx:/home/thamizh/Desktop/CD_Record/exp6# cc lex.yy.c y.tab.c
y.tab.c: In function 'yyparse':
y.tab.c:1031:16: warning: implicit declaration of function 'yylex' [-Wimplicit-function-declaration]
1031 |         yychar = yylex ();
      |                ^~~~~~
y.tab.c:1166:7: warning: implicit declaration of function 'yyerror'; did you mean 'yyerrok'? [-Wimplicit-function-declaration]
1166 |         yyerror (YY_("syntax error"));
      |         ^~~~~~
      |         yyerrok
root@thamizh-HP-Pavilion-Laptop-15-eg2xxx:/home/thamizh/Desktop/CD_Record/exp6# ./a.out
Enter the expression:
a=3;
Valid expression!
```

## RESULT: