Ex No: 5
Date:

RECOGNIZE AN ARITHMETIC EXPRESSION USING LEX AND YACC

AIM:

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

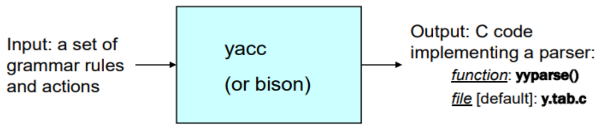
ALGORITHM:

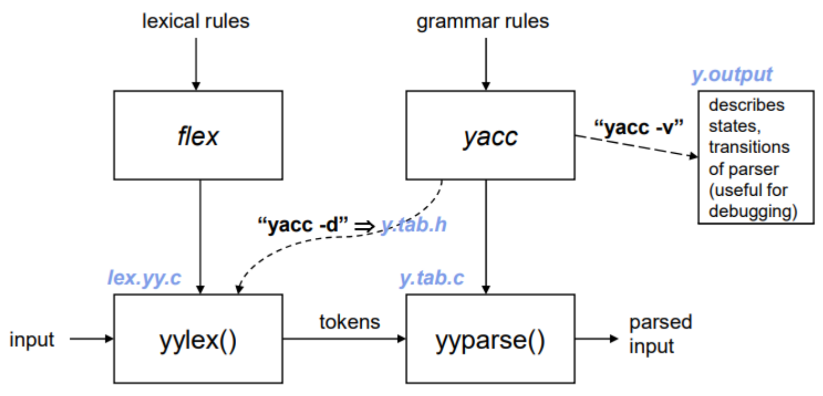
- Using the flex tool, create lex and yacc files.
- In the C include section define the header files required.
- In the rules section define the REGEX expressions along with proper definitions.
- In the user defined section define yywrap() function.
- Declare the yacc file inside it in the C definitions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


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:

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:

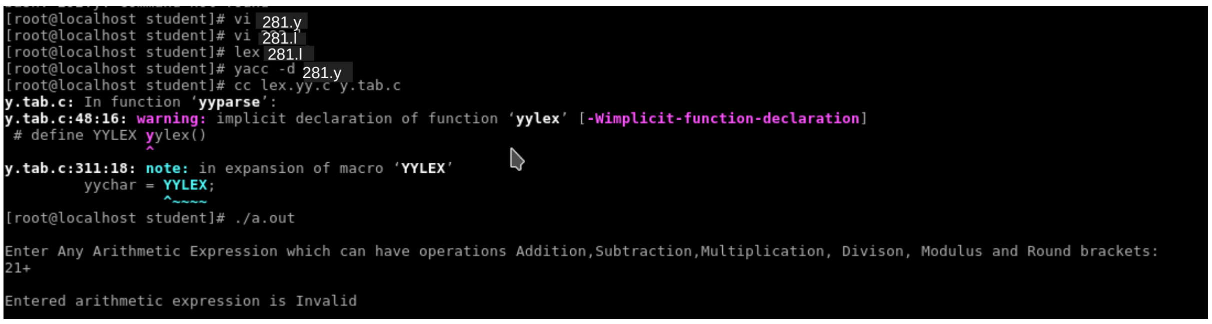
```
 %{
   #include<stdio.h>
%}
%token NUMBER
%token VARIABLE

%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@localhost student]# vi 281.y
[root@localhost student]# vi 281.l
[root@localhost student]# lex 281.l
[root@localhost student]# yacc -d 281.y
[root@localhost student]# cc lex.yy.c y.tab.c
y.tab.c: In function ‘yyparse’:
y.tab.c:48:16: warning: implicit declaration of function ‘yylex’ [-Wimplicit-function-declaration]
 # define YYLEX yylex()
                ^
y.tab.c:311:18: note: in expansion of macro ‘YYLEX’
         yychar = YYLEX;
                  ^~~~~
[root@localhost student]# ./a.out

Enter Any Arithmetic Expression which can have operations Addition,Subtraction,Multiplication, Divison, Modulus and Round brackets:
21+

Entered arithmetic expression is Invalid
```

RESULT: