Ex No: 7

Date:

EVALUATE EXPRESSION THAT TAKES DIGITS, *, + USING LEX AND YACC

AIM:

To perform arithmetic operations that takes digits,*, + using lex and yacc.

ALGORITHM:

● Using the flex tool, create lex and yacc files.

● In the definition section of the lex file, declare the required header files along with an external integer variable yylval.

● In the rule section, if the regex pertains to digit convert it into integer and store yylval. Return the number.

● In the user definition section, define the function yywrap()

● In the definition section of the yacc file, declare the required header files along with the flag variables set to zero. Then define a token as number along with left as '+' , '-'

, 'or' , '*' , '/' , '%' or '(' ')'

● In the rules section, create an arithmetic expression as E. Print the result and return zero.

● Define the following:

▪ E: E '+' E (add)

▪ E: E '-' E (sub)

▪ E: E '*' E (mul)

▪ E: E '/' E (div)

If it is a single number, return the number.

● In driver code, get the input through yyparse(); which is also called as main function.

● Declare yyerror() to handle invalid expressions and exceptions.

● Build lex and yacc files and compile.

PROGRAM:

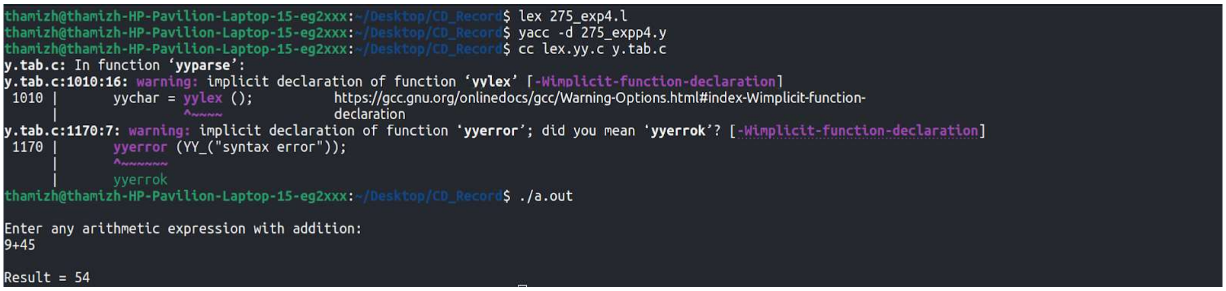
evaluate.l:

```
%{
#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;
}
```

evaluate.y:

```
%{
#include <stdio.h>
%}
%token NUMBER
%left '+'
%%
ArithmeticExpression: E {
   printf("\nResult = %d\n", $1);
   return 0;
}
;
E: E '+' E {
   $$ = $1 + $3;
}
| NUMBER {
   $$ = $1;
}
;
%%
int yyerror() {
   printf("\nEntered arithmetic expression cannot be computed\n");
   return 0;
}
```

OUTPUT:



```
thamizh@thamizh-HP-Pavilion-Laptop-15-eg2xxx:~/Desktop/CD_Record$ lex 275_exp4.l
thamizh@thamizh-HP-Pavilion-Laptop-15-eg2xxx:~/Desktop/CD_Record$ yacc -d 275_expp4.y
thamizh@thamizh-HP-Pavilion-Laptop-15-eg2xxx:~/Desktop/CD_Record$ cc lex.yy.c y.tab.c
y.tab.c: In function ‘yyparse’:
y.tab.c:1010:16: warning: implicit declaration of function ‘yylex’ [-Wimplicit-function-declaration]
 1010 |       yychar = yylex ();           https://gcc.gnu.org/onlinedocs/gcc/Warning-Options.html#index-Wimplicit-function-
      |                ^~~~~               declaration
y.tab.c:1170:7: warning: implicit declaration of function ‘yyerror’; did you mean ‘yyerrok’? [-Wimplicit-function-declaration]
 1170 |       yyerror (YY_("syntax error"));
      |       ^~~~~~~
      |       yyerrok
thamizh@thamizh-HP-Pavilion-Laptop-15-eg2xxx:~/Desktop/CD_Record$ ./a.out

Enter any arithmetic expression with addition:
9+45

Result = 54
```

RESULT :