

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>
    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("\nEnter arithmetic expression is Valid\n\n");  
}  
  
void yyerror()  
{  
    printf("\nEnter arithmetic expression is Invalid\n\n");  
    flag=1;  
}
```

OUTPUT:

```
thamizh@thamizh-HP-Pavilion-Laptop-15-eg2xxx:~/Desktop/CD_Record$ lex 278_exp4.l
thamizh@thamizh-HP-Pavilion-Laptop-15-eg2xxx:~/Desktop/CD_Record$ yacc -d 278_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 ();
      |                  ^~~~~~
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:
45+36

Result = 81
```

RESULT :