LPCC Assignment 4

Name: Digvijay Pawar
Class: TY.Btech Comp B2
Gr.No: 21810344
Roll No: 322043

Aim: Write a program to evaluate an arithmetic expression, built-in functions, and variables using YACC specification.

Objective:

1. To understand LEX and YACC Concepts.
2. To implement LEX Program and Corresponding YACC program.
3. To study about Lex and yacc specification.

Theory:

A parser generator is a program that takes as input a specification of a syntax, and produces as output a procedure for recognizing that language. Historically, they are also called compiler-compilers.

YACC (yet another compiler-compiler) is an LALR(1) (LookAhead, Left-to-right, Rightmost derivation producer with 1 lookahead token) parser generator. YACC was originally designed for being complemented by Lex.

YACC translates a given Context Free Grammar (CFG)specifications (input in input_file.y) into a C implementation (y.tab.c) of a correspondingpush down automaton(i.e., a finite state machine with a stack). This C program when compiled, yields an executable parser. The source SIL program is fed as the input to the generated parser (a.out). The parser checks whether the program satisfies the syntax specification given in the input_file.y file.

Code:

1. File - yacc file(ass4.y)

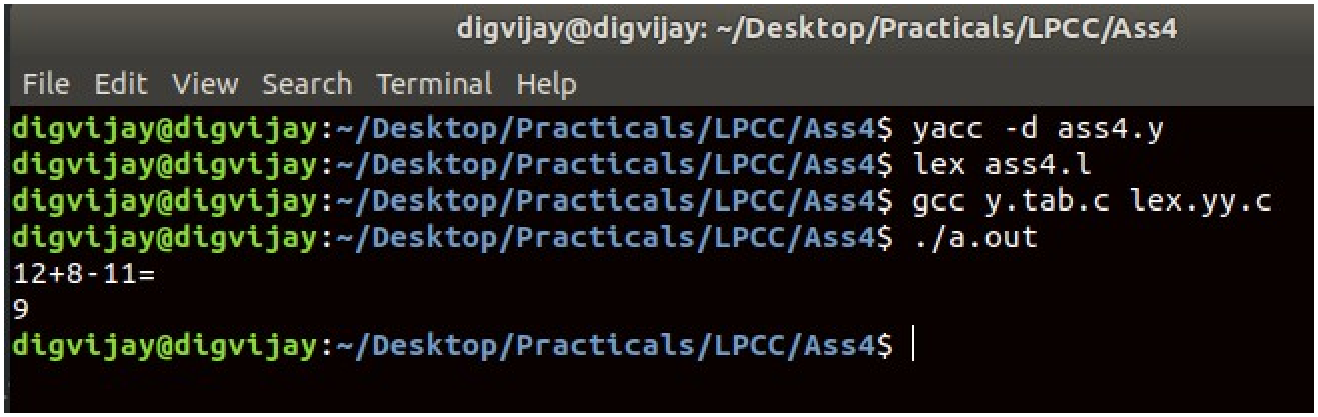
```
%{

#include<stdio.h>
void yyerror(char*);
int yylex(void);

%}
%token number
%%

var1 :  exp     {printf("%d\n",$$); }
;

exp: exp '+' number {$$ = $1 + $3; }
| exp '-' number {$$ = $1 - $3; }


;

%%
```

```
void yyerror(char* s){
            fprintf(stderr,"%s\n",s);
}

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

2. File - lex file(ass4.l)

```
 %{

 #include "y.tab.h"

 extern int yylval;

 %}

 %%

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

 [ \t]              {;}

 [-+*/\n]       return *yytext;

 [\n]+ {return 0; }

 =       {return yytext[0];}

 %%
```

Output :


digvijay@digvijay: ~/Desktop/Practicals/LPCC/Ass4
File Edit View Search Terminal Help

```
digvijay@digvijay:~/Desktop/Practicals/LPCC/Ass4$ yacc -d ass4.y
digvijay@digvijay:~/Desktop/Practicals/LPCC/Ass4$ lex ass4.l
digvijay@digvijay:~/Desktop/Practicals/LPCC/Ass4$ gcc y.tab.c lex.yy.c
digvijay@digvijay:~/Desktop/Practicals/LPCC/Ass4$ ./a.out
12+8-11=
9
digvijay@digvijay:~/Desktop/Practicals/LPCC/Ass4$ 
```