# LPCC LAB

**ASSIGNMENT NO: 4**

**Aim: Write a program to**

## Evaluate an arithmetic expression

1. **built-in Functions**
2. **Variables using YACC specification.**
3. **Evaluate an arithmetic expression:**

**Source code:**

Lex File:

%{

#include<stdio.h> #include "y.tab.h" extern intyylval;

%}

%%

[0-9]+ {

yylval=atoi(yytext);

return NUMBER;

}

[\t] ;

[\n] return 0;

. return yytext[0];

%%

intyywrap()

{

return 1;

}

YACC FILE:

%{

#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 Arithmetic Expression:\n"); yyparse();

if(flag==0)

printf("\nEntered arithmetic expression is Valid\n\n");

}

void yyerror()

{

printf("\nEntered arithmetic expression is Invalid\n\n"); flag=1;}

## Output:

hp@hp-Combo-AN515-31:~$ lexarithmatic.l hp@hp-Combo-AN515-31:~$ yacc -d arithmatic.y hp@hp-Combo-AN515-31:~$ gcclex.yy.cy.tab.c hp@hp-Combo-AN515-31:~$ ./a.out

Enter Arithmetic Expression: 2\*3+1

Result=7

Entered arithmetic expression is Valid hp@hp-Combo-AN515-31:~$ ./a.out Enter Arithmetic Expression:

2\*

Entered arithmetic expression is Invalid.

1. **Built in Functions:**

## Source code:

Lex File:

%{

#include <stdio.h> #include "y.tab.h"

%}

%%

[\t ] ;

sqrt { return MATH;}

\( return OB;

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

return NUM;}

\) return CB;

%%

intyywrap()

{

return 1;

}

YACC File:

%{

#include <stdio.h> #include <stdlib.h> #include <math.h> #include <string.h> void yyerror(char\*); intyylex(void);

%}

%token MATH OB CB NUM

%%

s: MATH OB NUM CB { $$ = sqrt($3); printf("Result is %d\n",$$); return 0;};

%%

void yyerror(char \*s )

{

fprintf(stderr, "ERROR: %s\n",s);

}

int main()

{

printf("Enter math function:"); yyparse();

return 0;

}

## Output:

hp@hp-Combo-AN515-31:~$ lexlibc.l hp@hp-Combo-AN515-31:~$ yacc -d libc.y

hp@hp-Combo-AN515-31:~$ gcclex.yy.cy.tab.c -lm

hp@hp-Combo-AN515-31:~$ ./a.out Enter math function:sqrt(9)

Result is 3

hp@hp-Combo-AN515-31:~$ ./a.out Enter math function:sqrt(

ERROR: syntax error

## Source code:

Lex File:

%{

#include <stdio.h> #include "y.tab.h"

%}

%%

[\t ] ;

strlen { return STR;}

\( return OB;

[a-zA-Z]+ { yylval.string = strdup(yytext);

return SR;}

\) return CB;

%%

intyywrap()

{

return 1;

}

YACC File:

%{

#include <stdio.h> #include <stdlib.h> #include <string.h> void yyerror(char\*); intyylex(void);

%}

%union {

char \*string; /\* string pointer \*/ intlen;

}

%token OB CB STR

%token <string> SR

%type <len> s

%%

s:STR OB SR CB { $$ = strlen($3); printf("Result is %d\n",$$); return 0;};

%%

void yyerror(char \*s )

{

fprintf(stderr, "ERROR: %s\n",s);

}

int main()

{

printf("Enter math function:"); yyparse();

return 0;

}

**Output:**

hp@hp-Combo-AN515-31:~$ lex libc2.l hp@hp-Combo-AN515-31:~$ yacc -d libc2.y

hp@hp-Combo-AN515-31:~$ gcclex.yy.cy.tab.c–lm hp@hp-Combo-AN515-31:~$ ./a.out

Enter string function:strlen(ab) length is 2

hp@hp-Combo-AN515-31:~$ ./a.out Enter string function:strlen( ERROR: syntax error

c) Variables using YACC specification:

## Source code:

Lex File:

%{

#include <stdio.h> #include "y.tab.h"

%}

DIGIT [0-9]

%%

[\t ] ;

[a-zA-z]+[a-zA-z0-9\_]\* {return ID;}

{DIGIT}+ { return NUM;} "," {return COMMA;}

";" {return SC;}

\n return NL;

. ;

%%

intyywrap()

{

return 1;

}

YACC File:

%{

#include<stdio.h> void yyerror(char\*); intyylex();

%}

%token ID NUM COMMA NL SC

%%

s: type1;

type1:varlist SC NL { printf("valid Variable declaration\n"); return 0;}; varlist: ID | ID COMMA varlist ;

%%

void yyerror(char \*s )

{

fprintf(stderr, "ERROR: %s\n",s);

}

int main()

{

printf("Enter variable names:"); yyparse();

return 0;

}

## Output:

hp@hp-Combo-AN515-31:~$ lexc.l hp@hp-Combo-AN515-31:~$ yacc -d c.y

hp@hp-Combo-AN515-31:~$ gcclex.yy.cy.tab.c hp@hp-Combo-AN515-31:~$ ./a.out

Enter variable names:a; valid Variable declaration

hp@hp-Combo-AN515-31:~$ ./a.out Enter variable names:a,b;

valid Variable declaration

hp@hp-Combo-AN515-31:~$ ./a.out Enter variable names:1a;

ERROR: syntax error