Bangladesh Army International University of Science and Technology

Department of Computer Science and Engineering

**Lab Report**

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| **Lab Report No** | : | 9 | | | | | | |
| **Lab Report Name** | : | A simple calculator that evaluates basic arithmetic expressions (addition and subtraction) using Lex for tokenization and YACC | | | | | | |
| **Course Title** | : | Compiler Design and Construction Sessional | | | | | | |
| **Course Code** | : | CSE-414 | | | | | | |
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| **Level** | : | 4 | **Term** | : 1 | **Section** | : B | **Group** | : |
| **Date of Submission** | : | 08/01/26 | **Semester** | : FALL 25 | **Year** | : 2026 | | |

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**Key Learnings:**

- Understand the role of lexical analysis (tokenization)
- Understand the role of syntax analysis (parsing)
- Write Lex specifications for tokens
- Write YACC grammar rules
- Build simple language processors
- Debug compilation errors
- Trace expression evaluation

**Code Implementation:**

Lab Works > lab9 > calc.l

```
%{
#include "y.tab.h"
%}

%%
[0-9]+      { yylval = atoi(yytext); return NUMBER; }
[+]         { return PLUS; }
[-]         { return MINUS; }
[\n]        { return 0; }
[ \t]       { /* ignore whitespace */ }
.           { printf("Invalid character: %s\n", yytext); }
%%
```

Lab Works > lab9 > calc.y

```
%{
#include <stdio.h>
#include <stdlib.h>
int yylex();
void yyerror(char *s);
%}

%token NUMBER PLUS MINUS

%%
expression:
      expression PLUS expression   { $$ = $1 + $3; printf("Result = %d\n", $$); }
    | expression MINUS expression  { $$ = $1 - $3; printf("Result = %d\n", $$); }
    | NUMBER                       { $$ = $1; }
    ;
%%
void yyerror(char *s) {
    printf("Error: %s\n", s);
}

int main() {
    printf("Enter arithmetic expression:\n");
    yyparse();
    return 0;
}
```

**Input Sample:**

Enter arithmetic expression:

5+8

**Output Sample:**

```
joha546@joha546:~/Projects/Compiler-Design-and-Construction/Lab Works/lab9$ ./calc
Enter arithmetic expression:
5+8
Result = 13
```