Max mark: 100

This lab contains a total of ten assignments. Write a well-commented code in C or C++.

1. Write a Lex program that calculates the count of words, special characters, lines, spaces, and tabs within an English paragraph. **(10 Marks)**

2. Write a Lex program for designing a DFA with an input alphabet of 0,1. This DFA should accept strings with an odd number of 0s or an even number of 1s, but not both simultaneously. **(10 Marks)**

3. Write a Lex program that forms a DFA over the input alphabet a, b to identify words containing an odd number of 'b' occurrences. **(10 Marks)**

4. Write a Lex program that recognizes strings initiated with 'b' and concluded with 'a' within the input alphabet a, b. **(10 Marks)**

5. Write a Lex program accepting 'baba' as a substring over input alphabet a, b. **(10 Marks)**

6. Write a YACC program to implement the following arithmetic operations: Addition, Subtraction, Multiplication, and Division. Also, print whether an arithmetic expression is valid or not. **(10 Marks)**

7. Write a C program to eliminate the left recursion of the following grammar. **(10 Marks)**

$$E->E+T/T$$
$$T->T*F/F$$
$$F->id$$

8. Write a C program to find the First and Follow sets of following grammar. **(10 Marks)**

$$E->E+T/T$$
$$T->T*F/F$$
$$F->id$$

9. Every compiler has an intermediate code representation phase. Given the set of expressions:

$$a + b + c * d/e + f.$$

Write a C program that can find the quadruples of the given expression for intermediate code representation. **(10 Marks)**

10. Write a program in C to find three address codes using triples for the following input expressions: **(10 Marks)**

$$a = b * -c + b * -c.$$