

## Lab Task 11

### Task 1

Scenario: You are working on a project that involves complex numbers in C++. You have created a class called "Complex" that represents a complex number. You want to implement a friend function that adds two complex numbers together and returns the result.

Define a "Complex" class with the following private data members:

int real: the real part of the complex number

int imag: the imaginary part of the complex number

Define a friend function called "addComplex" that takes two "Complex" objects as arguments and returns a new "Complex" object representing the sum of the two complex numbers. The friend function should have the following signature:

Complex addComplex(Complex c1, Complex c2)

In the "Complex" class, define a public member function called "display" that displays the complex number in the format  $a + bi$ , where  $a$  is the real part and  $b$  is the imaginary part.

In the main function, create two "Complex" objects and add them together using the "addComplex" function. Display the result using the "display" function.

### Task 2:

Modify the first program by defining another class named Operations, that contains the methods for adding and subtracting the complex numbers. In main create two objects of the complex class and using the methods defined in the Operations class, add and subtract those numbers, and display the results.

### Task 3:

Modify task 2 by using a friend class instead of declaring multiple friend functions.

### Task 4:

Modify the task 1 code by overloading the unary operator ++, that will increment the real part of the complex number by one. Similarly overload the binary operator + that will perform the addition of two complex numbers when the user writes the following statement:

Complex c3=c1+c2

Note: In this case the operator function should be declared inside the class.

**Task 5:**

Modify the task 4 in such a way that both the operator functions should be declared outside the class and declared as friend with the Complex class.