Assignment 02
Intro to C/C++ Spring 2023

C++ Programming Assignment: Complex Numbers Manipulation

Objective:
The objective of this assignment is to reinforce the concepts of operator overloading, inheritance, and command-line arguments in C++. You will be creating classes to represent complex numbers (both integer and float) and implementing basic arithmetic operations on them.

Details:

Task 1: Integer Complex Number Class [Marks: 20]

First, create a class named *IntComplex* to represent a complex number with integer parts. This class should have the following:

Two private integer data members to store the real and imaginary parts of the complex number.
A constructor that takes two integers to initialize the complex number.
Overloaded operators +, -, *, and / to add, subtract, multiply, and divide two IntComplex numbers respectively.
Your class declaration should be in a .h file (e.g., IntComplex.h), and the definition of the member functions and overloaded operators should be in a .cpp file (e.g., IntComplex.cpp).

Task 2: Floating Point Complex Number Class [Marks: 30]

Create another class named FloatComplex that represents a complex number with floating-point parts. This class should inherit from the IntComplex class and override the arithmetic operators to handle floating point numbers.

Two private float data members to store the real and imaginary parts of the complex number.
A constructor that takes two floats to initialize the complex number.
Overloaded operators +, -, *, and / to add, subtract, multiply, and divide two FloatComplex numbers respectively.
Similar to IntComplex, your FloatComplex class declaration should be in a .h file (e.g., FloatComplex.h), and the definition of the member functions and overloaded operators should be in a .cpp file (e.g., FloatComplex.cpp).

Task 3: Main Program [Marks: 10]

Finally, write a main program to demonstrate the functionality of your classes.

Your program should take command line arguments to create instances of IntComplex and FloatComplex. For instance, the first two arguments could represent the real and imaginary

parts of an IntComplex number, and the next two could represent those of a FloatComplex number.
It should perform and print the result of addition, subtraction, multiplication, and division of the given complex numbers.
Your main() function should be in a separate .cpp file (e.g., main.cpp). Make sure to include your .h files correctly.

Submission Guidelines:

- Adhere to OOP principles and C++ best practices.
- Make sure there are no syntax errors in your code. The program must compile and run without any issues.
- Ensure proper usage of inheritance, operator overloading, and command-line arguments.
- Make sure to handle edge cases and potential errors. For instance, division by zero should be properly addressed.
- Your code should be well-commented, explaining what each part of the code does.
- Push your code to GitHub and share the repository link on moodle.

Due Date:
(04th June 2023)

Best of luck!