Assignment5_D1228803 Adeline Chen 陳宣妤 Report

Programming Assignment 5: Complex Number Overloading

1.Explain the differences in programming complex number assignments using C and C++

In C, when working with complex numbers, it is necessary to define a struct to represent them and write functions to perform operations on those structs. Memory management, operator overloading

In C++, complex header provides class that packed both real part and imaginary parts, along with overloaded operators for easy manipulation. It is easily to perform operations like addition, subtraction, multiplication, and division without having to write custom code for each operation.

2. Advantages and/or disadvantages of programming in C++

Advantages:

1)Better performance, higher-level languages allows more direct control over hardware and memory.

2) Rich standard Library, for example I/O stream, which can save development time and effort.

3) Supporting of object-oriented programming (OOP), for example, classes, which make it easier to write modular and reusable code.

Disadvantages:

A more abstract language which is more higher-level language, The big disadvantage is that it takes a completely different way of thinking about programming. In C by making functions, which call other functions. In C++ creating abstractions and use interfaces to represent them. By building details into classes which implement those interfaces.

3. How I develop my assignment solution

In this assignment, it is also a C++ project assignment which comes in quadratic_verifier_equation.dev, quadratic_verifier_equation.cpp, complex_overloading.h, complex_overloading.cpp.

In my complex_overloading.h and complex_overloading.cpp., I first defined complex class to represent complex numbers. Implement constructors, operator overloads, and member functions for arithmetic operations and absolute value calculation.

Next, in the quadratic_verifier_equation.cpp, I create functions to print quadratic equations and verify roots against equations. In the main() function, the program let the user input for coefficients, calculate roots using the quadratic formula, and print results. By using loop for continuous execution and validate roots using the verification function. Lastly, the program ensure error handling and precision management.