Report of assignment1

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The files establish a framework for solving quadratic equations and verifying their solutions with C programming, integrating custom functions defined in a header file (.h) and implemented across two C files (.c). The complex_D1265209.h file defines a complex number of data structure and associated operations, such as addition, multiplication, and printing complex numbers, to handle real and imaginary roots. The complex_D1265209.c file implements these operations, allowing for complex arithmetic required when the quadratic equation's discriminant is negative.

The main program in `quadratic_equation_verifier_D1265209.c` is designed to input coefficients of a quadratic equation, calculate its roots (real or complex), and display the results. The way I print the results is to print each part of the equation separately as shown in the instructions. The process begins by prompting the user for the coefficients of the quadratic equation (a, b, and c). It then calculates the discriminant (b^2 - 4ac) to determine the nature of the roots. If the discriminant is non-negative, it calculates two real roots using the quadratic formula and prints them. For a negative discriminant, it calculates and prints complex roots, utilizing functions from `complex_D1265209.c` to handle complex arithmetic. What needs special attention is that when the discriminant is equal to zero, although it is a multiple root, it is still necessary to store nearly two roots to ensure that the subsequent root will be correct.

This program carefully verifies the correctness of the calculated roots by substituting them back into the original equation. Bring both roots back for inspection at the same time. The calculation methods used here are all calculated using functions in complex. This step is critical to ensure the reliability of the solution.