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CS 405

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09/09/2024

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The program included two main functions: test\_overflow and test\_underflow. These functions were designed to check the behavior of data types like int, char, short, long, and their unsigned equivalents, along with real number types such as float, double, and long double. In the test\_overflow function, the program first added values incrementally to test if an overflow would occur. It also caught any overflow errors thrown by the add\_numbers function using a try-catch block, which displayed the appropriate error messages when an overflow was detected. Similarly, the test\_underflow function subtracted values incrementally to test for underflow, handling underflow errors in a similar manner.

The program used templates to ensure the same logic could be applied to multiple data types without duplicating code. By defining add\_numbers and subtract\_numbers as template functions, the code could handle various types without modification, maintaining flexibility. The output to the console for each data type indicated whether overflow or underflow occurred, and the program also printed successful operations where no overflow or underflow was detected. The assignment gave hands-on practice with detecting and preventing overflow and underflow conditions across different data types, demonstrating how data behaves when its limits are exceeded in both signed and unsigned forms.