

**Objectives:** You will gain experience using C++:

- while loops - to do sentinel-controlled processing
- for loops - to do counter-controlled processing

Download the following file to your desktop: <http://www.cs.uni.edu/~fienu/cs051f09/labs/lab4.zip>

Extract this file by right-clicking on lab4.zip icon and selecting Extract All.

**Part A:** (From the last page of yesterday's handout) Using a loop, we can process data repeatedly, but how do we know when to stop? Two main ways can be used:

- counter controlled - the user tells us **before the loop** how many data items will follow. A `for` loop can then be used to loop that many times.
- sentinel controlled - the user might not know how many data items will follow, so we loop until a special *sentinel* value that cannot be confused with a valid datum is entered, e.g., -999 for a test score. A `while` loop or `do-while` loop are used for sentinel controlled processing.

Suppose I wanted to average the scores on an assignment for a class.

a) The counterControlledAverage folder you downloaded and extracting in lab4.zip contains a Visual Studio C++ project file: counterControlledAverage.sln. Double-click on it to start this project in Visual Studio. Complete the `for` loop of the counter-controlled program.

b) The sentinelControlledAverage folder you downloaded and extracting in lab4.zip contains a Visual Studio C++ project file: sentinelControlledAverage.sln. Double-click on it to start this project in Visual Studio. Complete the `while` loop of the sentinel-controlled program.

**After you have both programs (a and b) working correctly, raise your hand and we'll check your work.**

**Part B:** Write **two** programs that calculates the amount of money a person would earn over a period of time if their salary is one penny the first day, two pennies the second day, and continues to double each day.

- The first program should prompt the user for the number of days, and then displays a table showing the day #, the salary for that day, and total amount paid from day 1 through that day.
- The second version of the program should determine how many days a person would need to work before they received a million dollars per day in salary.

**After you have both programs (a and b) working correctly, raise your hand and we'll check your work.**

**Print BOTH your programs (.cpp files) for Part B to turn in -- make sure you include your name AS A COMMENT AT THE TOP OF YOUR PROGRAM.**

**Do not forget to "log off" of the machine you are working on.**