Project 2B. Vinnie's Pudding

This exercise has two steps. We are now on step 2.
1. Calculate a derivative using Excel (due Monday)
2. Implement a program to do the same thing in c++ (due Wednesday)

For part 2.

(a) Repeat what you did on Friday, but use c++. Let t range from 0-2 s using steps of 0.1 s. For each time compute an estimate for dx/dt. Print the time, the value of x, and your estimate for the derivative dx/dt to the console. Separate the values by a comma. Save this set of data to a file. Use the .csv file extension.

Perhaps the easiest way to save to a file is to direct the output to a file instead of to the command window. When you run the program you can direct the output to a file by typing "programName" rightarrow "fileName.csv". Open this file using Excel (you'll need to use delimiters) and make the same graph that you did on Friday. Label it and show it to me. If you do not finish during class, you'll need to save your cpp file and your Excel file and place them into the P2B drop box.

(b) Integrate your numerical derivative using the left rectangle method. Assume x(t=0)=0 m. If you can think of a better way, great, but today implement the left rectangle method. This should get you back to $2t^2$. Or when t=2s, x should equal 8 m. Print the time, the value of x, and your estimate for the derivative dx/dt and your integral to a file. Make a graph. What value of x do you get when t=2 s? Label it and show it to me. If you do not finish during class, you'll need to save your cpp file and your Excel file and place them into the P2B drop box.

Style Notes for this Assignment

- Create a function outside your main program that takes a float input (t) and returns a float output (x) that equals $2t^2$.

- Same as previous, but comments no longer needed to indicate use of header files.

Due Wednesday. If needed, place cpp,.xls file in D2L dropbox.