Lab 1

Csci 1113, Fall 2015

Warm-Up
(1) There are about 168 students in this class and 34 in this lab. Find the lecture to lab student ratio. (Since we are counting students, these should be of type int.)

Stretch
(1) A basic definition of the derivative is:
\[ f'(x) = \frac{f(x+h) - f(x)}{h} \]
Use this definition to compute the derivative of \( f(x) = x^3 = x*x*x \) at \( x=20 \) with \( h=10^{-14} \).
(i.e. int x=20; double h = 1e-14;)
Compare this with the real derivative (\( f'(x) = 3x^2 \), so \( f'(20) = 1200 \)) and explain to the TA why the computer does not return 1200. (You can play around with the value of the exponent in “h” if you want to see different results.)

(2) Download kittyCode.cpp on the class website. When you run the program you should be able to enter a number. The program is supposed to convert from Fahrenheit to Celsius. Fix the code to do the conversion correctly. Please do not write the program from scratch, though this would probably be easier than fixing the code. (You do not need to keep it in the shape of a cat.)

(3) King Arthur needs to cross the bridge of death (see: https://www.youtube.com/watch?v=cV0tCphFMr8 for the context). The bridge keeper is currently away on maternity leave and has asked you to write a program to ask the questions in his stead. Write 3 (not 5) questions to be asked. (Hint: you might want to consider using an “if” in your code.) (More fun: if you want to randomize a question, you might want to copy code from numberGuessing.cpp on the class website.)

Workout
(1) Start your main method with the following variable declaration (and initialization):
\[ \text{int } x = 5; \]
Write code that displays (using cout) the value \( 5! = 120 \). Again you may not use any numbers other than the one in the line above (i.e. you cannot directly use “4” anywhere). (Hint: you may need more than one variable).
Challenge
(1) Write a program that asks for these values (in this order):
Partner 1's full name
Partner 1’s height (approximate)
Partner 2's full name (or an imaginary friend)
Partner 2's height

(Hint: there is a tricky part here. Think about what is actually in the “buffer”.)

Output
Your code should output both partner's names and their combined height (if one stood on top of the other's head)

(2) Ask for one partner's full name (you should enter it in the format: [first] [(middle)] [last])

Output
Modify this input as display it with the last name first followed by a comma.
(Format: [last], [first] [(middle)] )

Example #1 (bold is what user types)
What is your full name?
James Edward Parker
Parker, James Edward

Example #2 (bold is what user types)
What is your full name?
James Parker
Parker, James