Homework 1
Assigned in Laboratory 2
Due Start of Laboratory 3

Please perform the following activities. This assignment is unpledged. However, you may not work with anyone else on this first assignment. You are allowed to talk with others, but your work must be your own.

Objective

The objective of this assignment is twofold: to practice coding programs that do interactive input and output, and to make sure that you understand how to write simple programs that compute useful things. Good programmers often write small programs to do a short, useful computation.

Problem

Produce a program that computes and displays the heat index (perceived temperature) from two user-supplied floating point values: a Fahrenheit temperature T and a relative humidity percentage R. There are several slightly different formulas for computing heat index. The formula we shall use comes from *USA Today*'s weather website at *http://www.usatoday.com*.

$$HeatIndex = -42.379 + 2.04901523T + 10.14333127R - 0.22475541TR - 6.83783\text{e-}03(T^2)$$
$$- 5.481717\text{e-}02(R^2) + 1.22874\text{e-}03(T^2R) + 8.5282\text{e-}04(TR^2) - 1.99\text{e-}06(T^2R^2)$$

Besides displaying the heat index value, your program should supply a legend that suggests that its user take care when the heat index is greater than 90 and even more so when the heat index exceeds 110.

Remember to prompt the user for the inputs, then echo them in a meaningful fashion.

All floating point values should use C++'s `double` representation.

Notes

Please review the CS101 style sheet before starting on the assignment. Be sure to use the standard header (i.e., your name, section number, etc.) in your program. The standard header for all our programs (unless instructed otherwise) will contain the following information:
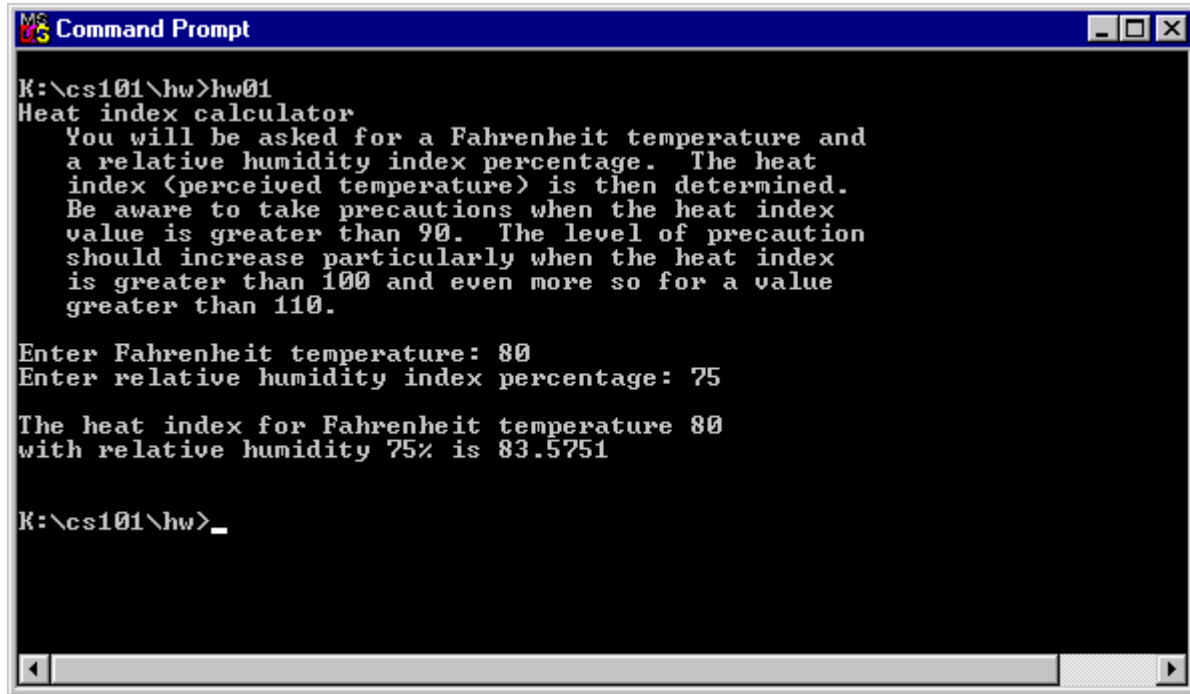
```
// Programmer:
// Student ID:
// E-mail:
// CS101 Lab Section:
// CS 101 Lab time:
```

You should submit your program electronically before the start of laboratory 3. See the CS101 website (*http://www.cs.virginia.edu/cs101*) for information on how to do this. Your program must be called `hw01.cpp`.

You should also turn in a hardcopy (printout) at the beginning of your laboratory when the program is due. This hardcopy is due at the beginning of laboratory 3.

The grading criteria for this assignment can also be found at our class website.

A sample run of the type of output that your program should produce is given below. Observe the legend, nice prompts, and labeled output. The phrasing that you use does not need to exactly mimic this sample, but it does need to be of similar quality.

```
Command Prompt                                                        _ □ ×

K:\cs101\hw>hw01
Heat index calculator
    You will be asked for a Fahrenheit temperature and
    a relative humidity index percentage.  The heat
    index (perceived temperature) is then determined.
    Be aware to take precautions when the heat index
    value is greater than 90.  The level of precaution
    should increase particularly when the heat index
    is greater than 100 and even more so for a value
    greater than 110.

Enter Fahrenheit temperature: 80
Enter relative humidity index percentage: 75

The heat index for Fahrenheit temperature 80
with relative humidity 75% is 83.5751


K:\cs101\hw>_
```