HW #2 - due Wednesday February 24

In addition to the following textbook exercises, complete the exercise on the following page:

Ross, Section 3.2 (pp79-83):

- Exercises #3, #4, #14, #17, #18. For #3, in addition to parts (a) and (b) in the text:

  (c) Find the sample standard deviations for the two given data sets (amounts of precipitation and number of days of precipitation in different cities).

  (d) Would you expect the variables to be positively correlated, negatively correlated, or neither? Briefly explain.

  (e) Create a scatterplot for the paired data set and calculate the correlation coefficient.

Ross, Section 3.3 (pp86-88):

- Exercises #6, #7 (these use the same dataset as Section 3.2 #2, so use the same spreadsheet for these exercises)

Ross, Section 3.5 (pp105-108):

- Exercises #2, #3

Standard deviation exercise: The students in a class take a 10-point quiz. The scores of the students are:

$$\{8, 3, 2, 7, 10, 9, 10, 0, 9, 8, 3, 2, 5, 4, 10\}$$

(i) Enter the data into a spreadsheet and calculate the mean $\bar{x}$.

(ii) Now suppose the class takes another 10-point quiz, and every students gets a score of 6. What is the mean score on this quiz? (You should be able to answer w/o doing any calculations.)

(iii) Create frequency histograms for the two quizzes, with each possible score 0-10 a separate class.

(iv) Use your spreadsheet to calculate the entries in this table:

x_i	Deviations: $x_i - \bar{x}$	Squared deviations: $(x_i - \bar{x})^2$
8		
3		
2		
7		
10		
9		
10		
0		
9		
8		
3		
2		
5		
4		
10		
$\bar{x} =$		$SS_x = \Sigma(x_i - \bar{x})^2 =$

(v) Now calculate the sample variance and sample standard deviation:

$$s^2 = \frac{SS_x}{n-1} =$$

$$s = \sqrt{s^2} =$$

(vi) Check that you get the same results using `=var(data)` and `=stdev(data)` in your spreadsheet.

(vii) Now consider a second quiz in which all the students get an identical score of 6. What is the standard deviation in this case?

(You should be able to figure out the answer without doing any calculations. Think about what the value of each deviation is, and hence the value of the squared deviations, and hence the value of the sum of squared deviations.)