Math 113: Classroom Activity 2 Name : _____
10 pts

Instructions:
Complete the survey of brand name recognition using the website. For each brand name given, rate how favorable your opinion about that brand is using a scale from 1 to 9. A 1 means that you have an extremely unfavorable opinion and a 9 means that you have an extremely favorable opinion. Use 5 if you have no opinion either way or have not heard of the company. When the form is completed, you will be given an ID number and two brands to use for this activity.

1. Record your brands and ratings here.

2. My ID is _____ and my two brands are _____ and _____.

3. Copy your ID number onto the two slips of paper provided by the instructor. These will be randomly distributed to other students. Gather two slips from other students and use that information to finish the activity. Write those IDs here:

   (A) _____ (B) _____

4. For Student (A), find the brands that are common to both of you.
   a. Record the brands and both of your ratings in the table below.
   b. For the "sq diff" row, compute the square of the difference in your ratings.

Brand									
Me									
(A)									
sq diff									

5. The sum of the squares of the differences is called the variation. It is a measure of how close your responses are to each other. What is the variation between your scores and person A's scores?

6. The sample variance, s^2, is found by dividing the variation by $df = n - 1$, where *n* is the number of values in the sample. What is the variance?

7. The standard deviation, *s*, is the square root of the variance. What is the standard deviation?

The questions so far have been designed to give you a sense of how to compare the closeness of two values. A huge portion of inferential statistics is about figuring out how close is close enough, but we're not ready for that yet. We need to build to that point and, to do that, we're going to limit ourselves to describing just one set of data and see how close the values are to the mean.

8. Record the ratings for Student (B) in the row of the table labeled *x*. You do not need to write down the brands, just the numbers. Square each value and write it in the second row. Finally, sum the values in each row.

	Values	Sum
x		
x^2		

9. The sample mean is the sum of all the values divided by the number of values. This can be written as $\bar{x} = \sum x / n$. What is the sample mean for Student (B)?

10. The sample variation is the sum of the squares of the deviations from the mean. This can be written as $Variation = \sum \left(x - \bar{x} \right)^2$, but that can be a lengthy process. It involves subtracting the mean from every value, squaring that difference, and then adding them up. A commonly used shortcut is $Variation = \sum x^2 - \left(\sum x \right)^2 / n$. This looks ugly, but it's a lot easier to use when you understand what the numbers are. For the $\sum x^2$, you first square each

number and then add them up. For the $\left(\sum x\right)^2$, you first add up the numbers and then square that sum. Find the variation for Student (B).

11. Find the sample variance by dividing the variation by $df = n - 1$.

12. Find the sample standard deviation by taking the square root of the variance.

13. Now we're going to see how favorable the brands are.
    a. Write down the brand names and the ratings for that brand. When you write the ratings, put them in order so that it will be easier to find the median.
    b. Find the sum of the values and the sum of the squares of the values for each brand and record them in the table.

Brand	Scores	$\sum x$	$\sum x^2$

14. Summarize the ratings for each brand.

Brand	n	Mean	Median	Variation	Variance	St Dev

15. The mean and median are measures of center, while the variation, variance, and standard deviation are measures of spread or consistency. The two measures used the most are the mean and the standard deviation.

    a. Which brand has the higher favorability?

    b. Which brand has more consistent ratings?