EXERCISE #4 - Statistics

1. What is the distinction between a population and a sample?

2. What is the difference between a parameter and a statistic?

3. A hospital conducts a survey of patients who were given an experimental, lifesaving treatment. Hospital administrators call patients at home and ask them to participate in the survey. What types of sampling bias might be involved?

4. What does the Central Limit Theorem say about populations and samples?

5. If a population has a mean of 600 and a standard deviation of 50, what is the Standard Error of the Mean for a sample size of 100? What does this value indicate?

6. In Hypothesis Testing, what is the difference between a one-tailed and two-tailed test?

7. A company wants to determine if two different sales departments had statistically the same number of sales per week over the last nine weeks. Perform a Student's t-Test on the following results. We recommend using a spreadsheet!

	Sales per Week		Dept A	Dept B	Dept A	Dept B
	Dept A	Dept B	$(x_1-\bar{x}_1)$	$(x_2-\bar{x}_2)$	$(x_1-\bar{x}_1)^2$	$(x_2-\bar{x}_2)^2$
1	40	43				
2	36	41				
3	42	44				
4	36	39				
5	35	37				
6	35	35				
7	41	44				
8	43	46				
9	34	40				
Sum:				Sum:		
	$\bar{x}_1$ =	$\bar{x}_2$ =		s^2=		

$$H_0: \bar{x}_A \geq \bar{x}_B$$

$$H_1: \bar{x}_A < \bar{x}_B$$

$$s^2 = \frac{\Sigma(x-\bar{x})^2}{n-1}$$

$$t = \frac{|\overline{x_1} - \overline{x_2}|}{\sqrt{\frac{{s_1}^2}{n_1} + \frac{{s_2}^2}{n_2}}} = \frac{|\quad - \quad|}{\sqrt{\frac{}{} + \frac{}{}}} = \frac{}{\sqrt{\frac{}{}}} = \frac{}{\frac{}{}} = \frac{}{} =$$

If t-Critical for a one-tailed test with 95% confidence and 16 degrees of freedom is 1.74, what can we conclude about these departments?