Statistics Assignment #8

- 1. A social scientist claims that the average adult watches less than 26 hours of television per week. He collects data on 25 individuals' television viewing habits and finds that the mean number of hours that the 25 people spent watching television was 22.4 hours. If the population standard deviation is known to be eight hours, can we conclude at the 1% significance level that he is right?
- 2. Suppose that 10 observations are drawn from a normal population whose variance is 64. The observations are: 58, 62, 45, 50, 59, 65, 39, 40, 41, and 52. Test at the 10% level of significance to determine if there is enough evidence to conclude that the population mean is greater than 45.
- Identify the hypotheses, define Type I and Type II errors, and discuss the consequences of each error: It is the responsibility of the federal government to judge the safety and effectiveness of new drugs. There are two possible decisions: approve the drug or disapprove the drug.

4.

- a. Compute the p-value in order to test the following hypotheses given that $\bar{x} = 52$, n=9, $\sigma=5$.
 - $H_0: \mu = 50$

 $H_1: \mu > 50$

- b. Describe what happen to the value of the test statistic and its p-value when the sample size increase
- 5. A random sample of 18 young adult men (20-30 years old) was sampled. Each person was asked how many minutes of sports they watched on television daily. The responses are listed here. It is known that $\sigma = 10$. Test to determine at the 5% significance level whether there is enough statistic evidence to infer that the mean amount of television watched daily by all young adult men is greater than 50 minutes.

50	48	65	74	66	37	45	68	64
65	58	55	52	63	59	57	74	65

6. Past experience indicates that the monthly long-distance telephone bill is normally distributed with a mean of \$17.85 and a standard deviation of \$3.87. After an advertising campaign aimed at increasing long-distance telephone usage, a random sample of 25 household bills was taken. The data as follows:

19.61	20.14	19.57	19.26	14.03	19.24	15.98	24.85	26.00	19.46
18.29	16.91	26.15	19.64	16.75	20.52	25.47	18.19	12.56	28.47
14.13	19.72	17.05	13.92	12.38					

- a. Do the data allow us to infer at the 10% significance level that the campaign was successful?
- b. What assumption must you make to answer Part a?

Use Excel or SPSS to perform the following questions. You should not only copy the reports on your homework but also write down hypothesis and comments.

- 7. A survey of 400 statistics professors was undertaken. Each professor was asked how much time was devoted to teaching graphical techniques. We believe that the times are normally distributed with a standard deviation of 30 minutes. Estimated the population mean with 95% confidence.
- 8. In the midst of labor-management negotiations, the president of a company argues that the company's blue-collar workers, who are paid and average of \$30,000 per years, are well paid because the mean annual income of all blue-collar workers in the country is less than \$30,000. That figure is disputed by the union, which does not believe that the mean blue-collar income is less than \$30,000. To test the company president's belief, an arbitrator draws a random sample of 350 blue-collar workers from across the country and asks each to report his or her annual income. If the arbitrator assumes that the blue-collar incomes are normally distributed with a standard deviation of \$8,000, can it be inferred at the 5% significance level that the company president is correct?