Name: _____ Business Data Analysis
Date: 201-316-VA

In Class Exercise #13: Hypothesis Testing

1. **Socially Conscious Stocks**

   Are stocks of companies that tout their socially conscious credentials priced differently? One measure of value is the P/E, or price-to-earnings, ratio. High P/E ratios may indicate a stock is overpriced. For the S&P stock index of all major stocks, the mean P/E ratio is 19.4. A random sample of 36 socially conscious stocks gave a P/E ratio mean of 17.9, with a standard deviation of 5.2. Does this indicate that the mean P/E ratio of all socially conscious stock is different (either way) from the mean P/E ratio of the S&P stock index? Use $\alpha = 5\%$

   (a) State the null and alternate hypotheses.

   (b) What sampling distribution will you use? Check its requirements.

   (c) Find or estimate the P-value. Sketch the sampling distribution and show the area corresponding to the P-value.

   (d) Conclude the test, and interpret your answer.

2. **Avalanches**

Slab avalaches are a specific type of snow avalanche. Slab avalaches studies in Canada have a thickness that is approximately normally distributed with mean 67 cm and a standard deviation of 10.6 cm. A sample of 16 slab thicknesses in Vail, Colorado gives a mean of 61.8 cm. Is the mean slab thickness in Vail different from that of Canada? Use $\alpha = 1\%$

(a) State the null and alternate hypotheses.

(b) What sampling distribution will you use? Check its requirements.

(c) Find or estimate the P-value. Sketch the sampling distribution and show the area corresponding to the P-value.

(d) Conclude the test, and interpret your answer.

3. **Athlete Graduation Rate**

Women athletes at the University of Colorado have historically had a graduation rate of 67%. Over the past several years, a random sample of 38 women athletes at the school showed that 21 eventually graduated. Does this indicate that the proportion of women athletes who graduate from the UofC is now less than it was before? Use a 5% level of significance.

(a) State the null and alternate hypotheses.

(b) What sampling distribution will you use? Check its requirements.

(c) Find or estimate the P-value. Sketch the sampling distribution and show the area corresponding to the P-value.

(d) Conclude the test, and interpret your answer.