Lesson 13: Inference for Two Means (Independent Samples)

Preparation

Directions: Please fill in Part I as you study the Reading Assignment. Once you finish the reading, complete the questions on Part II. You may use your notes, the key, and the help videos. Be sure to take this completed assignment to your group meeting where you can ask and help answer questions on this assignment.

Problems

Part I: Use the information in the reading assignment to complete these questions.

1. What is the difference between matched pair data and independent samples?

2. Complete a chart. In the left hand column fill in the names of the four quantitative hypothesis tests we have completed thus far in Unit II. (The first row is shown for you.)

Hypothesis Test	Requirements	Name of Distribution	Null and Alternative Hypotheses
One Mean-sigma known	Data are a simple random sample from the population. The distribution of sample means is normal	Normal distribution	$H_0 : \mu = \mu_0$ $H_a : \mu < \mu_0$ $H_a : \mu > \mu_0$ $H_a : \mu \neq \mu_0$

Part II:

Independent Samples - One of the professors in the BYU-Idaho Math Department collected data from BYU-Idaho students to compare the mean wages of BYU-Idaho male students to BYU-Idaho female students. The students from his classes completed a survey which he then used to analyze if there is difference in these wages. (Use the Class Survey Data to complete this problem: Class Survey Data for SPSS, Class Survey Data for Excel)

3. Design the Study:

   a. What is the research question?

   b. State the null and alternative hypothesis.

4. Collect the Data:

   a. Describe the data collection procedures.

5. Describe the Data:

   a. In a short paragraph use summary statistics to describe the data. After the paragraph insert an appropriate and well labeled graph to illustrate the data.

6. Make Inferences:

   a. What type of hypothesis test is appropriate?

   b. Are the requirements met for this test? Explain.

   c. Compute the test statistic.

   d. State the degrees of Freedom.

   e. Compute the P-value and compare it to the alpha level.

   f. Make a decision. Do you reject the null hypothesis or fail to reject it?

   g. Present your conclusions in the form of an English statement.

   h. Rather than testing a hypothesis, now say you just wanted to estimate the difference between female and male wages at the 95% confidence level. create a confidence interval to estimate this difference.

   i. Now interpret the confidence interval you built above.

7. Take Action - In a short paragraph describe the action you feel should be taken based on the statistical results above.