

Project - Analyze Your Own Data

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Focus: Analyze a set of data that you have collected.

You will collect data on a topic of interest to you then use descriptive statistics to present the data and inferential statistics to analyze the data.

Step 1: Decide on a Topic (Do this right away!)

Imagine you are about to start a business and you want to research your target demographic or products similar to what your business will provide. Define a question that can be answered with a single mean (average) comparing two means.

Step 2: Collect Data

For this project, you must collect data that will allow you estimate your parameter of interest (μ or p) and make a decision about your claim/question.

- Your dataset must have at least 30 cases, but more is better!
- Do your best to gather the best sample you can, but time is limited, and I don't expect you to spend money to accomplish this.
 - Randomly select your sample, use some type of random number generator to assist in gathering your sample. A very simple random number generator is a coin flip.
 - If you are unable to randomly sample, state what makes it not random. State why it is a convenience sample or haphazard sample rather than random.
 - Clearly define the population you are interested in. Do your best to ensure that your sample is representative of the population you are interested in.
 - If you are unable to sample in the way you prefer, state what the flaws are in your sample, and how you would fix it if you had more time and money.
- Justify why your sample is better than haphazard.
- Include your data in your report.

Step 3: Descriptive Statistics (Do as soon as you have all your data)

You only need to analyze one variable full credit. It may be interesting to gather data on multiple variables as your form your questions, but remember you only need to analyze one variable.

Use Excel to create the descriptive statistics and at least one graphical display.

- **Descriptive Statistics:**
 - Include summary statistics such as the \bar{x} , s , median, and mode.
- **Graphical Display:**
 - Include box plot or histogram.

Step 4: Inferential Statistics ()

- **Confidence Interval**
 - 1) Show the formula you are using with proper statistical notation.
 - 2) Calculate the results for your data.

3) Write a sentence interpreting your results in context of your project question.

- **Hypothesis Test** Complete and label the 6-steps of a test of hypothesis:

1) Define the population and parameter. State the null and alternative hypotheses.

2) Check the assumptions. State you are using $\alpha=0.05$.

3) Calculate the sample statistic.

4) Find the p-value.

5) Make a formal decision of whether to reject H_0 or not reject H_0 .

6) State the conclusion in the context of your project claim.

Step 5: Write Your Report

For 1 bonus point your group will make a **short** presentation to the class at that time.

Here is what the written paper should include:

- A **brief introduction**, describing your claim/question, the parameter you are estimating, the population it applies to, and why you chose it. Describe all relevant variables.
- A discussion of **sampling technique** as described in Step 2.
- The **descriptive statistics and analysis** as described in Step 3 above.
- The **confidence interval** as described in step 4 above.
- The **hypothesis test** as described in step 4 above.
- A **conclusion** that summarizes your team's findings and any surprises or insights you had during the process of making your project.

Formatting requirements for the paper:

- There is no minimum number of pages required; just do what it takes to fulfill the requirements.
- Any calculations, tables, graphics, or Excel screenshots will be included within the body of the text.
