OVERVIEW

The main purpose of this project is to provide you an opportunity to work through a full cycle of statistical research. This project will account for 20% of your grade. You may work in groups (up to 4 people) on the project, and turn in a combined paper. The steps are outlined below:

PART 1 – Form a group and select a topic and general question

Find a topic you are interested in and begin to focus on a broad question about the topic. Do not worry about specific hypotheses at this point. The main importance at this step is to find something that interests you, keeping in mind that you will need to get data. (Early Deadline – see below)

Example Topics & General Questions
Social Issues: Do tougher penalties actually reduce crime?
Education: Are colleges too expensive for many students today?
Medical: Is quality of medical care worse today?
Labor: What is the effect of immigration and outsourcing on jobs?
Economics: What effect does the real estate crisis have on the economy?

Write-up: Describe the topic you chose in sufficient detail so I understand it including why you selected this topic. Formulate general questions about the topic and then chose one, giving reasons as to why you chose this question.

PART 2 – Find the data – Create Survey

This is the research part of the project and you will need to get data that is relevant to your general question. You may use the library, the Internet or design your own survey to find information. There are many sources of government and other data available on the class website. You must have several data items, both categorical and numeric. If you have difficulty in finding data, ask me for help.

What you want to find is raw data, not summarized data or a research paper about data (That’s what you are doing!) You may need to change your general question if data is completely unavailable, but contact me first. (Early Deadline – see below)

Write-up: Identify all sources you researched, including the ones that were unsuccessful. List a source for the data you selected with sufficient detail so I could easily find it. Attach a hard copy or a floppy disk of the data. If you are doing a survey, please submit a copy of your proposed survey BEFORE sampling.

PART 3 – Summarize the Data

Summarize the data with descriptive statistics and graphs such as histograms, box plots and dot plots for numeric data and contingency tables, pie and bar charts for categorical data. (Early Deadline – see below)

Write-up: Attach summarize statistics and graphs with appropriate labels that are self-explanatory.

PART 4 – Formulate Research Hypotheses

Research hypotheses are very specific statements that can be tested using the data you found in Step 2 and methods you have learned (or will learn) in the course. Based on your general question in selected in Step 1, formulate several research hypotheses (Ho, Ha) that you will use to answer your general question.

Example:
General Question: Is the quality of care under an HMO different from a PPO?
Research Hypotheses: Ha: The mean Infant Mortality rate is higher for patients covered by an HMO

Write-up: Restate your general question, and list 3 to 5 research hypotheses. Explain how each research hypothesis relates to the general question.
PART 5 – Select the Statistical Tests or Models

Select the most appropriate test for each of your research hypothesis. You are not limited to only the tests we have covered in this course, and you may use me as a resource in helping identify the appropriate test. Be sure to pay attention to the assumptions needed, and find the “best” (most powerful) test to use.

Write-up: For each research hypothesis, describe the test you will use, the data you will use, and the assumptions you need to make.

PART 6 – Conduct the Tests

Using what you have learned in the course, conduct the appropriate tests. Computer use is highly encouraged! You will also want to compare your results to your descriptive statistics and graphs at this stage.

Write-up: Attach all computer output that CLEARLY shows the test conducted, the data used and the results.

PART 7 – Reporting results and Conclusions

The last step of the project is to write a final paper. Present and interpret the results to a non-statistician reader. This paper should be typed, about two pages long. This paper should include your research question, statistical tests and results.

Write-up:
Introduction: Explain your question and why it is important/interesting.
Methods: Explain the source and characteristics of your data, why you selected and how you conducted these tests.
Results: Explain what the results are, whether they were statistically significant, what they mean, and any limitations in your work.
Conclusions: Explain why your results are (or are not) important in answering your general question, and what further research would be helpful or necessary.

Project Due Dates:

<table>
<thead>
<tr>
<th>Part</th>
<th>Description</th>
<th>Points</th>
<th>Due Date</th>
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<tbody>
<tr>
<td>1</td>
<td>Selecting group and General Question - Draft</td>
<td>5 pts</td>
<td>April 15</td>
</tr>
<tr>
<td>2</td>
<td>Getting Data or Survey approved by Instructor</td>
<td>5 pts</td>
<td>May 4</td>
</tr>
<tr>
<td>3</td>
<td>Summary Statistics and Graphs of Data</td>
<td>10 pts</td>
<td>May 27</td>
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<tr>
<td>1-7</td>
<td>Hypothesis Testing and Final Paper</td>
<td>80 pts</td>
<td>June 21</td>
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NOTES:

Your final paper should include all parts, even material already submitted from Parts 1, 2 and 3.

Add a page to the final paper describing each individual’s responsibilities and contributions. Everyone needs to contribute.

You are encouraged to contact me with progress reports. I can help you when you get stuck or make suggestions if you seem to be off course. Feel free to email me an attached file for review.

Ultimately, this is your project. Be creative and try to make it interesting for you.