

## Final Project

Each student will complete a project with an assigned group of students. The project must include the acquisition of a novel set of data, an interesting question to address, the creation of an R Markdown document that contains a reproducible process of data manipulation, graphical exploration, modeling, analysis, and interpretation, using the appropriate methods from the course. The project will culminate in a report displayed as an HTML document and separate short written report (maximum two pages) with an executive summary of the project questions, methods, and results. In addition, each group will present an 8-minute summary of their project during discussion section.

## Important Dates

- **November 15.** Project proposal due.
- **December 2.** Draft of HTML document and written report due.
- **December 9, 10.** Project presentations in discussion meetings.
- **December 16.** Project report (HTML + Executive Summary) due.

## Grading

The entire final project will be worth 100 points. Note that 25 of the 100 points are based on the quality of *your individual assessments of the work of other groups*.

part	points
Proposal	5
Drafts	5
Draft Peer Review	15
Presentation	15
Presentation Peer Reviews	10
Final Report	50

## Project Proposal

The project proposal should be a knitted R Markdown document which contains the following elements.

- The names of the students in the group.
- The question or questions of interest that motivate the planned study.
- The source of data.
  - Best if you already have found data and can describe it.
  - Sufficient to have a plan on what you will find.
- A very brief summary of the methods you plan to use to address the primary questions of interest.

## Draft of the Documents

You should turn in four (or more) documents:

- An R Markdown file with your analysis.
- One (or more) files with your data.
- A knitted HTML file which contains your full report.
- A knitted PDF file which contains no more than two pages with an executive summary of your full report.

## R Markdown

- I should be able to knit your document if the file and all of the data files are in the same directory.

## HTML Full Report

The knitted HTML document should contain the following sections. There is no limit on the length of this document, but getting your points across concisely and persuasively is the goal.

The knitted document should **not include any of the code used for the analysis or graphics**. (Set `echo=FALSE` or `include=FALSE` in the R code chunks as appropriate.)

- Introduction
  - Describe the question of interest and the motivation for the analysis.
  - Your introduction should conclude with a thesis statement:
    - \* A question
    - \* An answer
    - \* Three pieces of evidence to support your answer
- Background
  - Describe the data, how it was collected, what the variables mean.
  - Cite the source of your data.
  - Describe any background information needed to better comprehend the question or questions you are posing and how the data relates to the question.
  - Describe any unusual factors to be aware
  - Describe what you intend to do in the rest of the report
- Analysis
  - Include numerical and graphical summaries of the data
  - Make sure to include at least one graphical display of the data that best supports your main conclusions for each of your primary questions.
  - For each inference you make, briefly describe the method you use and what the results are.
  - Provide evidence to support each of your claims.
- Discussion
  - Provide broader interpretations of your analysis and describe how to interpret your results to address your question of interest.
  - Discuss any potential short-comings of the analysis.
  - Discuss future directions for additional work
    - \* New questions
    - \* Different methods to address the same questions
    - \* New data you might collect to refine your understanding
  - Summarize your primary conclusions and the primary evidence that supports these conclusions.

## Data

- One or more data files that can be read in to replicate your analysis

## Executive Summary

- A separate document that you knit into a PDF document. (I do not need to see the source R Markdown).
- Limit is two pages
- Include:
  - the thesis statement
  - a brief background summary
  - primary results
  - description of the primary evidence to support your results
- You may include graphs and numerical summaries, but the page limit is strict.

## **Presentation**

- You will create a presentation to show to other groups in your discussion session.
- The time limit will be 6 minutes to talk, 1 minute for questions and transition
- Present a select summary of your full report

## **Peer Review**

- You will be asked to read and comment on two different group projects documents
- I will grade the quality and usefulness of your reviews
- Do not use abusive language when providing feedback
- Full credit requires specificity
  - More examples later.
- You will also be asked to fill out a form to provide feedback on presentations.
- I will examine these before returning them to the groups.
- You will evaluate all other groups in your discussion session.

## **Final Project**

- The format of the final project will be the same as the draft and the executive summary.