

# Final Project

Due Saturday, May 18 at 11:59 pm.

In this class, we have covered many different ways to look at decision-making. In fact, you can think of the whole class as being split up into four main modules:

- **Decision Analysis** involves using decision rules to determine the best alternative. We've used tools such as expected values and present value, and methods such as payoff matrices and rolling back decision trees, to help break down complicated decisions.
- The **Descriptive Perspective** on decision-making involves using theories such as utility theory and prospect theory along with analysis of biases and heuristics and different ways of thinking (system 1 vs system 2) to explain why humans make decisions in the way that they do.
- **Linear Programming** provides a way of making decisions when your decision variables are continuous, and can take many values. Even though there are many possibilities, tools such as Excel Solver help us find the answer with relative ease.
- **Classification Trees**, along with other data-driven decision-making tools, help remove as much personal bias as possible, and provide a way to make decisions based on what actually happened.

These are all very different ways of approaching the subject of decision-making, and in the final project, you'll choose one or more of them to focus on.

## Requirements

In **groups of three to four people**, you will write a **seven-page double-spaced paper** using concepts covered in class to analyze a situation, event, strategy, or phenomenon and apply decision-making theory. You have some freedom in determining what you want to do for your project, but I would encourage you to think about how multiple ways of decision-making might help you make the best decisions possible. I will provide a few project ideas, but you are also encouraged to think about how you might apply decision-making in something you are interested in.

The final project, regardless of what you choose to focus on, should have these main components:

- A **Cover Page** containing the title of the paper, as well as the names of everyone in the group. The cover page does NOT count towards the seven pages.
- An **Introduction** describing what you'll be analyzing in the paper, as well as how you'll be doing it. This is where you'll motivate the problem/scenario, and explain why you're using the methods you'll be using. If you are looking at a specific decision that is to be made, you should state what the objectives are, what the alternatives (or decision variables) are, and how you'll be making the decision. If you are doing a project using the descriptive perspective, you must do research with outside sources to describe the decisions that you'll be analyzing.
- The **Main Body** can vary depending on the type of project you choose. If you are doing a data-driven decision-making project using classification trees or using linear programming, you may have separate **Methods** and **Results** sections. Alternatively, you may have one main body section for a more research-oriented paper that uses the descriptive perspective.

- A **Conclusion** that may include a discussion of where your analysis might have gone wrong or been flawed, and a discussion of possible assumptions.

As mentioned before, you have freedom in choosing the type of project that you want to pursue. They will generally be based on one of the four sections of the class mentioned at the beginning, but may also incorporate elements from different parts of the class. For example, a decision analysis project may include a discussion of possible biases that might have affected the decision-making process, or a linear programming project may use some data to motivate why the constraints are constructed in a certain way.

## Data (for data-driven projects)

Select datasets have been provided for you to use. You may also choose to bring in your own datasets. If you do, you **MUST** get them approved by me. Please email me the dataset and include in your proposal that you have sent me a dataset to look at.

A good dataset will have a clear binary variable that you can use as your outcome variable, with plenty of other variables with which you can predict your outcome. If you want to use a non-binary variable as your outcome, that is ok, but you must either explain how you will transform it into a binary variable, or provide a clear explanation of what types of analyses you will use.

## Citations

Particularly for projects using the descriptive perspective and linear programming, you may have to look up sources for your final project. You **must include citations** whenever applicable in your project, using the **APA style** for in-text citations. That is, please use author-year citations in parentheses within the text, with references at the end. The references section does not count toward your page limit.

## Project Proposal

Each person must submit a project proposal as part of their Assignment 9 submission. This project proposal must contain:

- The **names** of each person in your group.
- A paragraph about the **topic** of your final project.
- A paragraph about which **methods** you will use for your final project, and how you might apply it.

Each person must submit their **OWN** project proposal, in their own words. This means that your group will agree on the topic overall, then you will summarize it yourself.

## Final Presentation (10% of Final Grade)

Every group must give a **five-minute final presentation** in class. Not everything must be completely finished and polished, but it must be good enough to give a thorough treatment of your topic and analyses. **You will only have a few days after the presentation to submit your final project, so please make sure that you have enough completed so that you can incorporate revisions after your presentation!**