

Project Proposal and Possible Final Project Topics

As a reminder, here are the requirements for the project proposal to submit with your Assignment 9 submission. 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.

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.

You may include questions you have for me about the best way to approach your topic as well, but I would suggest talking to me as much as possible during class to not only ask questions about what I expect from the project, but also to brainstorm ideas.

Descriptive Perspective: Climate Change

Key question: Consider the issues the world faces with climate change. What might affect how people make decisions on this matter?

This would be a much more qualitative research-oriented paper, though there is the possibility of looking for data as well. Make sure you think about the basic payoff matrices or decision trees that people might use regarding this issue, as well as how various theories and biases might affect them.

Descriptive Perspective: Vaccinations

Key question: There have been multiple cases of disease outbreaks due to parents deciding not to vaccinate their children. What are the factors that might contribute to this decision?

As with the climate change project, you should think about the various theories and biases that might come into play in this. You should also think about the decision analysis concepts such as payoff matrices and decision trees when you do this analysis. In addition, you should do some external research to support your paper.

Linear Programming: Fundraising

Key question: Suppose you have been given a small grant of \$50,000, which you can use to run fundraising campaigns. What would be the best way to allocate resources to raise the most money?

This project would require some research into various ways to fundraise. For example, consider a bake sale. You can look up how you can use the money to purchase various ingredients, consider the time and labor it takes to create the bake sale items, then determine the profit you might get from various items that you sell in a bake sale. You might consider what the effects of a sale on certain ingredients might be, or how you might improve profits if you were to introduce a different item.

For this project, I expect you to use the best estimates for values that you can find. This involves doing research about how you might go about actually implementing the results that you get. For example, in the bake sale case, you might include recipes to figure how much of each ingredient to use.

Data-Driven Decision-Making: Bank Customers

Key question: Suppose you are working for a bank that keeps track of which customers close their accounts. What can you do to combat this?

Dataset: bankchurn.csv

The dataset contains information about customers as well as whether they ended up closing their accounts or not. You need to be able to predict which customers will end up closing their accounts, so that you can target them to try to keep (perhaps by providing special offers?).

Data-Driven Decision-Making: Mushrooms

Key question: Given a dataset of mushrooms and their characteristics, can we decide whether the mushroom is poisonous or edible?

Dataset: mushrooms.csv

The dataset provided contains data about mushrooms. You need to use decision tree models to determine how to identify mushrooms that are good to eat, and provide a recommendation for recognizing good mushrooms. Think about how this might be used in practice, and how different measures of model validity might be better or worse.

Data-Driven Decision-Making: Job Attrition

Key question: Given data from the HR department of a company, you are tasked with finding a way to reduce employee attrition. What might you be able to do to reduce employee attrition?

Dataset: EmployeeAttrition.csv

Job attrition is costly for any company. The hiring, training, and integration of a new person costs money, not to mention the work lost during the entire search process. Because of this, it is much more beneficial for a company to introduce measures to retain their employees. Your task is to find a way to predict which employees might leave, and suggest possible programs to help keep those employees within the company.