

University of Washington
Department of Mathematics

Mini-Project

MATH 394: Probability I

Instructor: Arman Jahangiri

Submission: Upload a PDF of your slides and either a working video link or an mp4 file on Canvas

Deadline: Friday, August 14, 2026 at 10:00 PM Pacific Time

This mini-project is worth **2% bonus on top of the final course grade**. This is an **individual project**. The goal is to practice academic presentation and mathematical communication.

Overview

For this mini-project, you will create a short recorded presentation in which you teach a probabilistic concept **not covered in our course**. You should imagine that you are teaching the topic to a classmate in MATH 394 who has the background of this course.

Project Requirements

Please follow all of the requirements below:

1. **Length.** Your video must be **at least 10 minutes** long.
2. **Individual work.** This is an **individual** project.
3. **Slides are required.** You should prepare slides and present by speaking over your slides.
4. **Presentation style.** Your presentation should mainly consist of **slides plus verbal explanation**. You should **not** rely on writing extensively on the slides while presenting. Brief annotation, circling, underlining, or pointing for clarity is fine.
5. **Recording method.** If you use macOS, I recommend recording with **QuickTime Player**. If you use another operating system, you may use any similar screen-recording app that allows you to record your screen and your voice. The recording should be of high quality and clear. Using cameras to externally record your screen is not accepted.
6. **Slides.** There is no restriction on the number of slides.
7. **Content.** Your presentation should include:
 - a short introduction and motivation,
 - a clear explanation of the main concept,
 - at least one worked example, application, or illustrative scenario,
 - a brief concluding summary.
 - citations
8. **Sources.** Your final slide should list the sources you used. Please use reliable sources and cite them clearly.

Topic Selection

You must choose a topic that is **not covered in our course**. A list of suggested topics appears below.

- Each student should choose **one** topic.
- Please submit your top five topic preferences (ranked from 1 to 5, where 1 is your most preferred topic and 5 is your least preferred) by completing [this form](#) no later than **July 15, 10:00 PM**. If no response is received by the deadline, it will be assumed that you do not wish to participate in this bonus project. After all responses are collected, you will receive your assigned topic. You can then choose to go with it, or in case it is not of your interest, you can choose a topic of your own not in the list.
- If you would like to present on a different topic, that is fine, but you must get approval first.

Suggested Topics

1. Birthday Paradox
2. The Banach Matchbox Problem
3. Coupon Collector Problem
4. Gambler's Ruin
5. Secretary Problem
6. Buffon's Needle
7. Benford's Law
8. Simpson's Paradox
9. St. Petersburg Paradox
10. Markov Chains
11. Random Walks
12. Poisson Processes
13. Branching Processes
14. Monte Carlo Methods
15. Capture–Recapture Estimation
16. Reservoir Sampling
17. Bloom Filters
18. PageRank
19. Reliability of Systems and Networks
20. Random Graphs (Erdős–Rényi Model)

Submission Instructions

Please submit the following on **Canvas**:

1. a **PDF** of your slides, and
2. either:
 - an **mp4** file, or
 - a **working video link**.

3. In the text prompt on Canvas, please answer Yes or No to the following two questions:

Question 1: Would you like your slides (not the video) to be used anonymously in the future on the instructor's website?

Questions 2: Would you like your slides (not the video) to be shown anonymously as sample projects to the students taking this course in the future?

Your response should be one of the following: (Yes, Yes), (Yes, No), (No, Yes), (No, No).

Please make sure that:

- your video link works,
- your audio is clear,
- your slides are readable,
- your file names include your name.

Grading

- **Mathematical correctness and understanding** — 40%
- **Clarity and organization of explanation** — 30%
- **Quality of example or application** — 20%
- **Professionalism and completion of instructions** — 10%

A strong project is one that explains one idea **clearly, correctly, and concisely**.

Late Policy

Because final grades are due very shortly after the end of the quarter, **late submissions cannot not be accepted**.

Note

This project is meant to be a useful opportunity to practice **learning by teaching**. Choose a topic that you find interesting, explain it carefully, and aim to teach it in a way that would help one of your classmates understand it.

If you have any questions, please email me at armanjg@uw.edu or post it on Ed discussion.