E201 Instructions for Final Project

March 2023

Deadline for Submission: May 2, 11:59 PM on Canvas.

Description/Instructions for Final Paper/Project Topic: select a topic from the list on Canvas or suggest your own topic and write a research paper about an application of linear algebra to data science or a connection between linear algebra and the real world.

Guidelines: A strong submission will include figures, mathematical notation, references cited, and inline code. You may not reuse a paper you are doing/have already done for another class.

Here are some guiding questions that may be helpful to guide your research and writing, but not all of these questions may be relevant for all the topics.

- How is linear algebra related to the subject? For example, what kind of vectors or matrices appear? What is their interpretation or what data do they encode? For the algorithm, process, or problem in question, what is the input to the problem? What is the output and what are the mathematical steps needed to produce it? Are there functions in Python related to it? Is there a code implementation you are able to understand?
- Can you give an example of the application? • either a small toy model or a real word data set/application? • Are the applications purely scientific in nature, or are there also commercial applications?

Formatting: 3-6 pages, 12pt, double spaced

How to structure the project report?

1. The Title: An appropriate title demonstrates the purpose and content of the project report.
2. The Introduction: The introduction gives a basic restatement of the project, explains the significance or importance of the project, and ends with a statement of the solution, when appropriate.

3. The Main Body or Mathematical Argument: The project report continues with a set-up of the project and a statement of any basic assumptions. The main body should involve the mathematical content and inline code. All the supporting graphs, tables, and diagrams should appear in appropriate locations within the text.

4. The Conclusion The conclusion of the project report critically and carefully analyzes the mathematical solution or solutions and investigates the appropriateness of the real-world solutions involved.

References: As a guideline, you should have at least 5 legitimate references, no more than one of which is Wikipedia and no more than one of which is a blog post. Other examples of appropriate references are expository or research articles, news articles, textbooks, scientific magazines, etc.

These guidelines are influenced by Seattle University's project guidelines and Dr. Delaney's project guidelines