Extra credit Project:

Design a class for a group of undergraduate students with basic discrete math (pre-Linear Algebra) skills on the following topics:

1. Define a vector space
2. Define and teach how to find Eigenvalues and eigenvectors (including the characteristic polynomial.
3. Define the transpose and inverse operations of matrices
4. Define the Singular Value Decomposition process
5. Solve a Singular Value Decomposition problem
6. Define and go over examples of a singular matrix
7. Go over row reduction steps
8. Describe Taylor Polynomials
9. Set-up a Maclaurin series example to go over
10. Describe the Gram-Schmidt process, why it is used and go over an example.

Submit a series of class notes and script for a video.
Make a video (approximately 3 hrs) explaining as many of the topics you choose. You can choose enough topics to cover any missing points on the midterm exam grade up to 85%. No exam that requires extra credit can exceed 85%. **No exceptions**.

For example, if you earned a 75 on the midterm exam, then the maximum points you can earn on this assignment is 10 points. If you earn the full 10 points, then your midterm exam grade will change to an 85. In this scenario, I would choose two topics to ensure that I can earn the 10 points.

Please see the rubric below for the number of points each topic is worth.

Due: Dec 18, 2023

Rubric:

Each topic (1-10) is worth between 1-5 points, depending on the video length (at least 20 minutes) and detail submitted for the topic, this includes but is not limited to: number of pages, number of fully worked examples and solutions, originality of work (cannot be copied directly from another source, but can be changed and cited) and clarity of explanation in the video (please prepare a script to help you make the video).

NOTE: ANY ACADEMIC DISHONESTY WILL BE REPORTED. If you do not cite your work with the appropriate literature, textbook, or website, you WILL earn a 0 on this extra credit and I will report you to the Computer Science Department.