EE 516: Mathematical Foundations of Machine Learning	Winter 2023

Homework 0
Due: Januray 13, 2023, 11:59PM PT

Student Name: *Instructor Name: John Lipor*

Problem 1 (0 pts)

Create a gradescope account on `https://gradescope.com`. Use course entry code **RZ6G3D** and use your PDX email and PDX Student ID and your given name and family name. Turning this assignment in via gradescope will be confirmation that you have completed this problem.

Be sure to follow the instructions given here and link all problems to get credit.

Problem 2 (0 pts)

Join the course slack channel following the link here and introduce yourself in the `social` channel. Please state: (1) your name, (2) why you're taking this class, and (3) a boring fact about yourself (see my example). You must use your PDX email.

Problem 3 (5 pts)

Spend a bit of time (no more than 30 minutes) researching what machine learning is. In the `interesting-reading` Slack channel, share either a definition that you found particularly helpful/clear or create and share your own definition based on what you've learned. Finally, explain why you think linear algebra and optimization may be important to machine learning.

Problem 4 (0 pts)

Complete the skills inventory below. For each item listed, indicate your level of comfort among:

(a) never heard of it   (b) heard of it   (c) some experience   (d) strong experience

1. matrix rank:

2. span (of set of vectors):

3. linear independence:

4. basis (for a space/subspace):

5. orthogonal vectors:

6. eigenvalue decomposition:

7. singular value decomposition:

8. Frobenius norm:

9. Principal Component Analysis:

10. Spectral Clustering:

11. Multidimensional Scaling:

12. gradient descent:

13. Alternating Direction Method of Multipliers (ADMM):

14. Iteratively Reweighted Least Squares (IRLS):

15. Empirical risk minimization

Problem 5   (0 pts)

Write (or type) something about yourself on a second page. This is just to test turning in assignments with solutions on different pages.