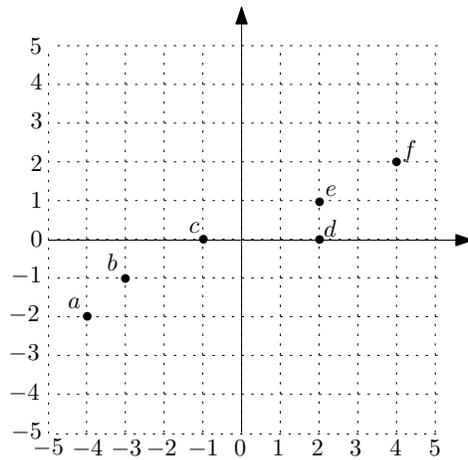


CMSC5724: Exercise List 10

Problem 1. Consider the following 2D dataset:



What is the variance of the projections of the 6 points onto the line $y = x$?

Problem 2. What is the co-variance matrix of the dataset in Problem 1?

Problem 3. Use PCA to find the line passing the origin on which the projections of the points in Problem 1 have the greatest variance.

Problem 4. In the previous problem, suppose that we perform dimensionality reduction using only 1 principle component (i.e., using only the first eigenvector), show the 6 reconstructed points.