

ECE421 - Winter 2022
Homework Problems - Tutorial #10

Theme: Support Vector Machines

Due: April 3, 2022 11:59 PM

Question 1 (Past Exam Question)

Consider a dataset with five data points in \mathbb{R}^2

$$X = \begin{bmatrix} 0 & 0 \\ 2 & 0 \\ 0 & -1 \\ 0 & 2 \\ 0 & 3 \end{bmatrix}, \quad y = \begin{bmatrix} -1 \\ -1 \\ -1 \\ +1 \\ +1 \end{bmatrix}. \quad (1)$$

Use X and y to train an SVM with following steps.

- (a) Formulate a Quadratic Program and write down the objective function and constraints.
- (b) Find and sketch the max-margin hyperplane. Then find the optimal margin.