# CSE 4/574 Gaussian Discriminant Analysis and Linear Regression

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#### Problem 1

# Problem 2

$$w = (X^T X)^{-1} X^T y$$

# Train data

MSE without intercept: 19099.446844570746 MSE with intercept: 2187.1602949303892

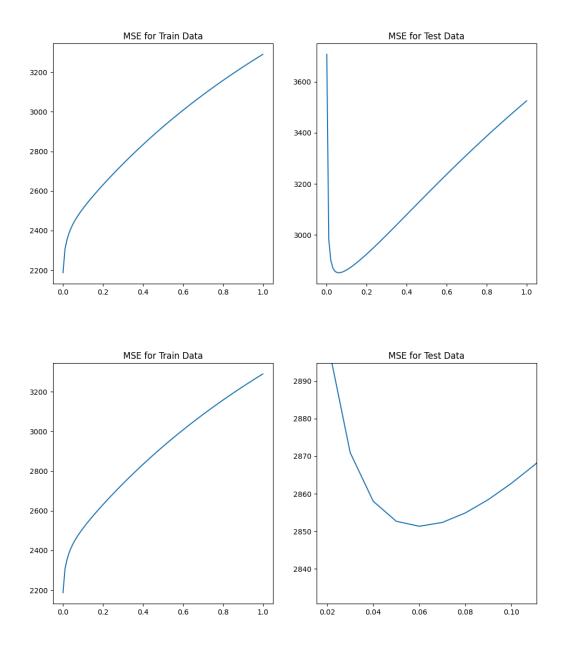
#### Test data

MSE without intercept: 106775.36153972965 MSE with intercept: 3707.8401811277313

In both the datasets (train and test), MSE with intercept is significantly less than MSE without intercept, and thus MSE with intercept is better.

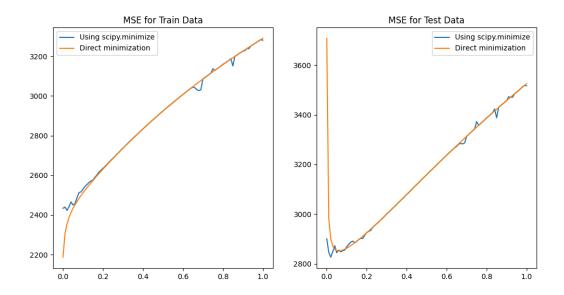
#### **Problem 3**

$$w = (\lambda I + X^T X)^{-1} X^T y$$

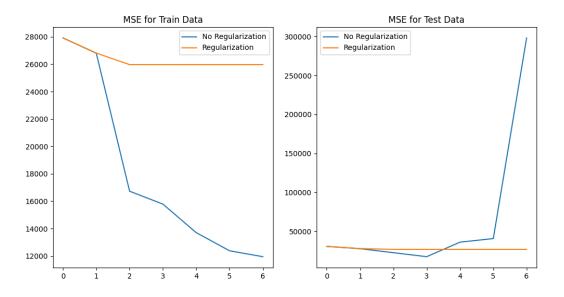


lambda\_opt = 0.06 (at this lambda, MSE for test data is lowest (~2851)

# **Problem 4**



# **Problem 5**



# Problem 6