COEN 140L Lab 3 Intro

Xuyang Wu

Environment setup

- **Install tensorflow package**
  - https://www.tensorflow.org/install

Linear regression by tensorflow

- **Follow the lecture housing price prediction example**
  - Load data(training data and testing data), do not forget to add bias to the training and testing data.
  - Define the tensor
  - Use the linear regression by the formula(from lecture note)
  - Predict the value and calculate MSE
  - Get train and test results
- **Take care of dimension of your data**

Ridge Regression (Regularized Least Squares)

- The working flow is similar as linear regression model
- Take more attention about how to calculate the optimal weight vector w, you need replace the w calculation method by ridge regression formula(lecture note)

$$\mathbf{w}^* = (\mathbf{X}^T\mathbf{X})^{-1}\mathbf{X}^T\mathbf{t} \quad \Longrightarrow \quad \mathbf{w}^* = (\lambda\mathbf{I} + \mathbf{X}^T\mathbf{X})^{-1}\mathbf{X}^T\mathbf{t}$$

Lab Tasks

- **Need demo** for week 3 assignment(10% points).
- Submit to Camino a pdf report with answers(60% points), the report contains some **results** which required by lab document, you also need to add some **observations** by different algorithms or different data.
- Submit all the source code needed to generate these answers to Camino(30% points).