CS688 Fall 2019
Homework 2
Due 10/9/2019 4:30pm

1. In this part, you will implement linear regression with multiple variables to predict house prices. The file http://cs.gmu.edu/~dbarbara/CS688/ex1data2.txt contains a training set of housing prices in Portland, Oregon. The first column is the size of the house (in square feet), the second column is the number of bedrooms, and the third column is the price of the house.
    a. Write a script that learns the parameters of the model using Gradient Descent.
    b. Write a script that uses Stochastic Gradient Descent utilizing one observation per step.
    c. Write a script that learns the parameters when using a model with L2 regularization.
    d. Write a script that solves the problem using the close form solution explained in class
    e. Compare the results of a, b, c, and d.
    f. For a, b, and c plot a graph of the loss function against the iterations.
    g. Repeat a. and b. with 2/3 of the data. Use the other 1/3 to test your model. Evaluate $L(w)$ in the training and test data sets.

Note: you can use the language of your choice to implement a, b, c, and d. But you cannot use a library function that implements GD or SGD. Instead, write your own code for that. Matlab or Python are preferred.

2. Problem 2.9 Rogers book
3. Problem 3.2 Rogers book