CS 6364 Homework 5

September 11, 2019

Deadline for the first submission: **Sep-26-2019**.

All assignments **MUST** have your name, student ID, course name/number at the beginning of your documents.

Your homework **MUST** be submitted via Blackboard with file format and name convention as follows:

      HW#_Name_writeup.**pdf**   (for writing part)

      HW#_Name_code.**zip**   (for coding part)

If you have any questions, please contact me.

Q1 Implement the following five algorithms to train a linear regression model for the Boston housing data set

https://towardsdatascience.com/linear-regression-on-boston-housing-dataset-f409b7e4a155

Split the dataset to a training set (70% samples) and a testing set (30% samples). Report the root mean squared errors (RMSE) on the training and testing sets.

1. The gradient descent algorithm
2. The stochastic gradient descent (SGD) algorithm
3. The SGD algorithm with momentum
4. The SGD algorithm with Nesterov momentum
5. The AdaGrad algorithm

Q2 (Logistic Regression): Implement the following five algorithms to train a logistic regression model for the Titantic dataset:

https://blog.goodaudience.com/machine-learning-using-logistic-regression-in-python-with-code-ab3c7f5f3bed.

Split the dataset to a training set (80% samples) and a testing set (20% samples). Report the overall classification accuracies on the training and testing sets and report the precision, recall, and F-measure scores for each of the two classes on the training and testing sets.

1. The gradient descent algorithm
2. The stochastic gradient descent (SGD) algorithm
3. The SGD algorithm with momentum
4. The SGD algorithm with Nesterov momentum
5. The AdaGrad algorithm