Programming Assignment 1

CSE474 - Group 36

Dylan Degenhart

Lloyd Tenedo

Adam Kantor

<u>Report 1</u>

PART 1 REPORT:
RMSE without intercept on train data - 138.20
RMSE without intercept on test data - 326.76
RMSE with intercept on train data - 46.77
RMSE with intercept on test data - 60.89
As you can see, it is better to use an intercept, as the resulting RMSE (error) is much lower.

<u>Report 2</u>

Performing the RMSE without intercept was always the worst performer train or test data regardless. Surprisingly performing the RMSE with the intercept always resulted in a lesser error than Gradient Descent.

Gradient Descent
Gradient Descent Linear Regression RMSE on train data -   75.34
Gradient Descent Linear Regression RMSE on test data - 78.82

RMSE
RMSE without intercept on train data - 138.20
RMSE with intercept on train data - 46.77
RMSE without intercept on test data - 326.76
RMSE with intercept on test data - 60.89

Report 3

The accuracy for perceptron learning are as follows:

Perceptron Learning
Perceptron Accuracy on train data - 0.54
Perceptron Accuracy on test data - 0.45

Report 4

Performing Logistic Regression yielded low weights regardless of train or test data.

Logistic Regression
Logistic Regression Accuracy on train data - 0.54
Logistic Regression Accuracy on test data - 0.45

Report 5

When calling the 'trainSGDSVM' method for 200 iterations with learning parameter set to 0.01, the SVM Accuracy was as follows:
SVM Accuracy on train data - 0.85
SVM Accuracy on test data - 0.87

Report 6

Judging from the graphs of the three classifiers, it appears that SVM provides the most accurate results with more positive and negative points on the correct side of the decision lines.