Programming Assignment-1 Report

Team Members:

1. Sandesh Kumar Srivastava
2. Charan Reddy Bodennagari
3. Venkata Narayana Rohit Kintali

Team Number: 35

Course Number: CSE 574

Part I - Linear Regression

Report 1:

```
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
```

As we can see from above results, RMSE is lower when we use intercept. So, we can say that the model performs better when we use intercept.

Report 2:

```
Gradient Descent Linear Regression RMSE on train data - 48.13
Gradient Descent Linear Regression RMSE on test data - 54.70
```

Gradient descent is comparable with direct minimization with intercept on training data. But, gradient descent performs better on test data. So we conclude that gradient descent is better than direct minimization.

Part II - Linear Classifiers

Report 3:

```
Perceptron Accuracy on train data - 0.84
Perceptron Accuracy on test data - 0.84
```

Report 4:

```
Logistic Regression Accuracy on train data - 0.84
Logistic Regression Accuracy on test data - 0.85
```

Report 5:

```
SVM Accuracy on train data - 0.72
SVM Accuracy on test data - 0.84
```

Report 6:

1. Based on test data results, Logistic Regression is the most accurate among the three classifiers.
2. As we can see from the plots below, all three classifiers performance varies very slightly. Even on different iterations, sometimes SVM performs best and sometimes Perceptron is best among the three. But on an average, we observed that Logistic Regression performs slightly better.