CS 434: Implementation Assignment 1

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Linear Regression

1. The learned weight vector of the test data is:

```
[3.95843212e+01  -1.01137046e-01   4.58935299e-02  -2.73038670e-03
3.07201340e+00  -1.72254072e+01   3.71125235e+00   7.15862492e-03
-1.59900210e+00   3.73623375e-01  -1.57564197e-02  -1.02417703e+00
9.69321451e-03  -5.85969273e-01]
```

   Here is the learned weight vector next to the features that each weight describes:

```
3.95843212e+01      Dummy
-1.01137046e-01     per capita crime rate by town
4.58935299e-02      proportion of residential land zoned for lots over 25,000sq.ft.
-2.73038670e-03     proportion of non-retail business acres per town
3.07201340e+00      Charles River dummy variable
-1.72254072e+01     nitric oxides concentration (parts per 10 million)
3.71125235e+00      average number of rooms per dwelling
7.15862492e-03      proportion of owner-occupied units built prior to 1940
-1.59900210e+00     weighted distances to five Boston employment centres
3.73623375e-01      index of accessibility to radial highways
-1.57564197e-02     full-value property-tax rate per $10,000
-1.02417703e+00     pupil-teacher ratio by town
9.69321451e-03      1000(Bk - 0.63)^2 where Bk is the proportion of blacks by town
-5.85969273e-01     % lower status of the population
```

2. Training Dataset ASE: 22.081273187
   Test Dataset ASE: 22.6382562966

3. Training Dataset ASE (Without Dummy): 24.4758827846
   Test Dataset ASE (Without Dummy): 24.2922381757