CSC242 PROJECT 4: LEARNING

For this project, we used the provided classes for Project 4 to implement our algorithms. This report include the exact commands needed to test program. We implement the following forms of machine learning:

(1) Decision tree learning (AIMA 18.3): We implement the core decision tree learning algorithm in DecisionTreeLearner.java.

a. To test the program using the restaurant example, you can run directly from Eclipse. The main method is located in /dt/examples/WillWaitProblem.java. There is Run Configurations setup so you don't need to type in "src/dt/examples/WillWait-data.txt" as the argument. To use the command-line: Place proj4 folder on desktop, open command prompt and type in the following command:

```
cd Desktop
cd proj4
cd bin
java dt/examples/WillWaitProblem dt/examples/WillWait-data.txt
```

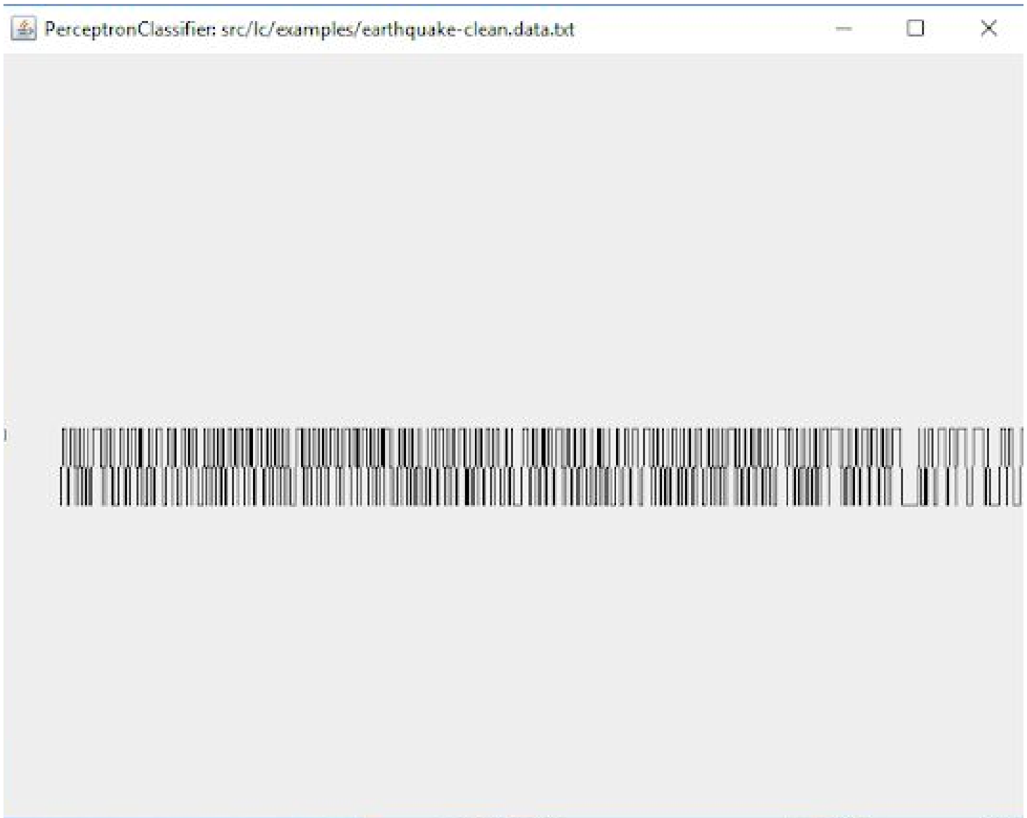
b. To test the program using the Iris data, you can run directly from Eclipse. The main method is located in /dt/examples/IrisProblem.java. There is Run Configurations setup so you don't need to type in "src/dt/examples/iris.data.discrete.txt" as the argument. To use the command-line: Place proj4 folder on desktop, open command prompt and type in the following command:

```
cd Desktop
cd proj4
cd bin
java dt/examples/IrisProblem dt/examples/Iris.data.discrete.txt
```

c. To test the program using the House Votes data, you can run directly from Eclipse. The main method is located in /dt/examples/HouesVotesProblem.java. There is Run Configurations setup so you don't need to type in "src/dt/examples/house-votes-84.data.mod.txt" as the argument. To use the command-line: Place proj4 folder on desktop, open command prompt and type in the following command:

```
cd Desktop
cd proj4
cd bin
java dt/examples/HouseVotesProblem dt/examples/house-votes-84.data.mod.txt
```

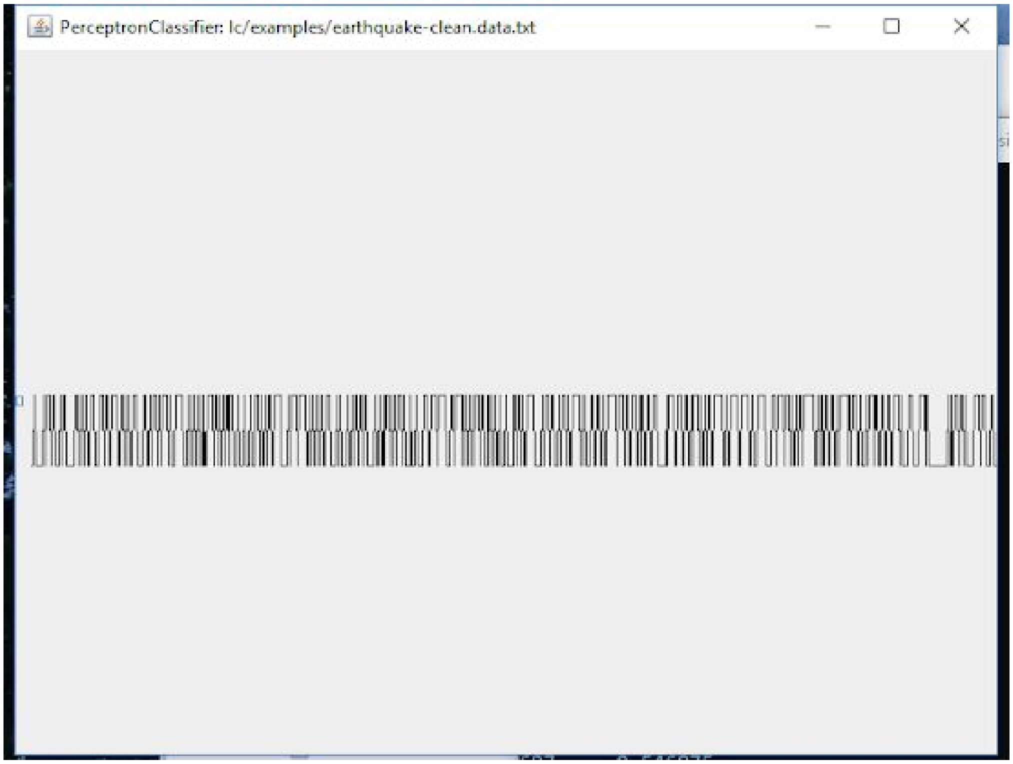
(2) Linear classifiers (AIMA 18.6): We implement the update() and threshold() methods for the PerceptionClassifier and LogisticClassifier classes.


PerceptronClassifier: src/lc/examples/earthquake-clean.data.txt

a. GRAPHS FOR EARTHQUAKE DATA

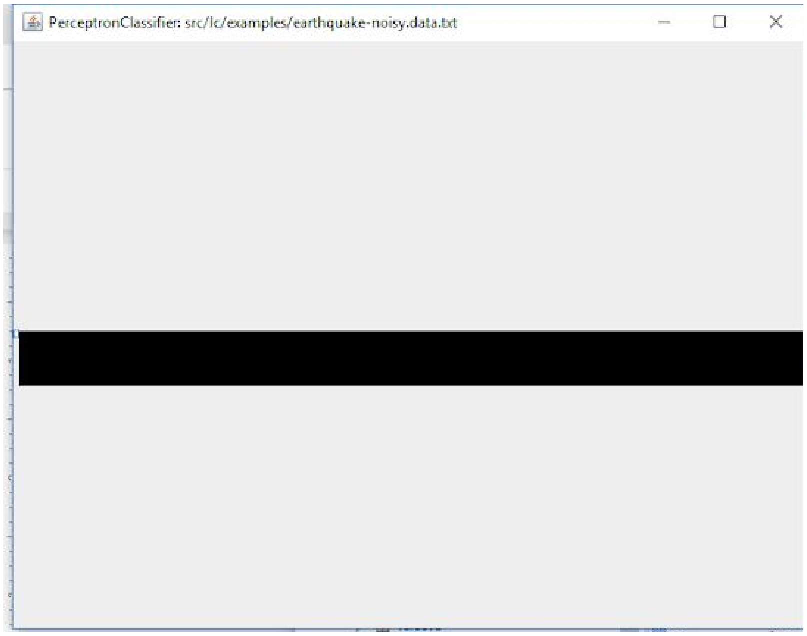
```
java lc/examples/PerceptronClassifierTest lc/examples/earthquake-clean.data.txt 700 1
```

Plot 1 shows the Perceptron Classifier with steps = 700 and alpha = 1



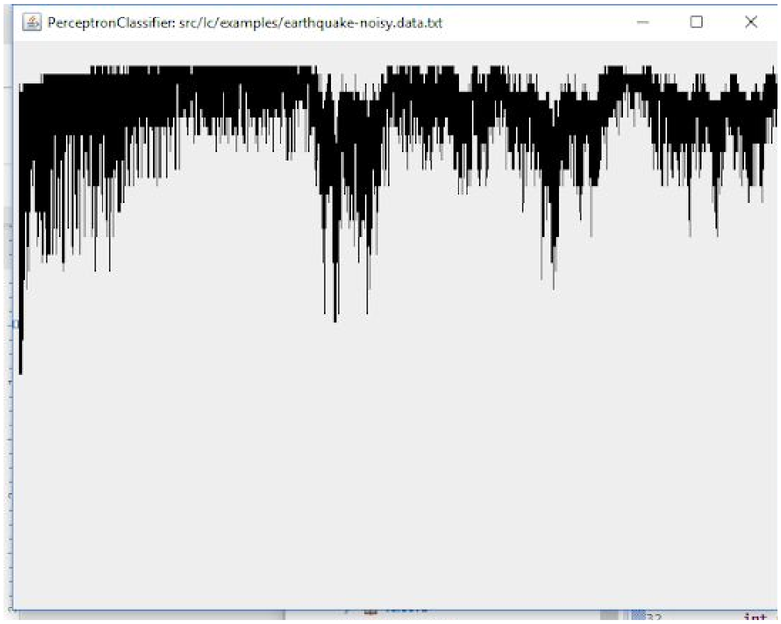
```
java lc/examples/PerceptronClassifierTest lc/examples/earthquake-noisy.data.txt 100000 1
```

Plot 2 shows the Perceptron Classifier with steps = 100000 and alpha = 1


PerceptronClassifier: src/lc/examples/earthquake-noisy.data.txt

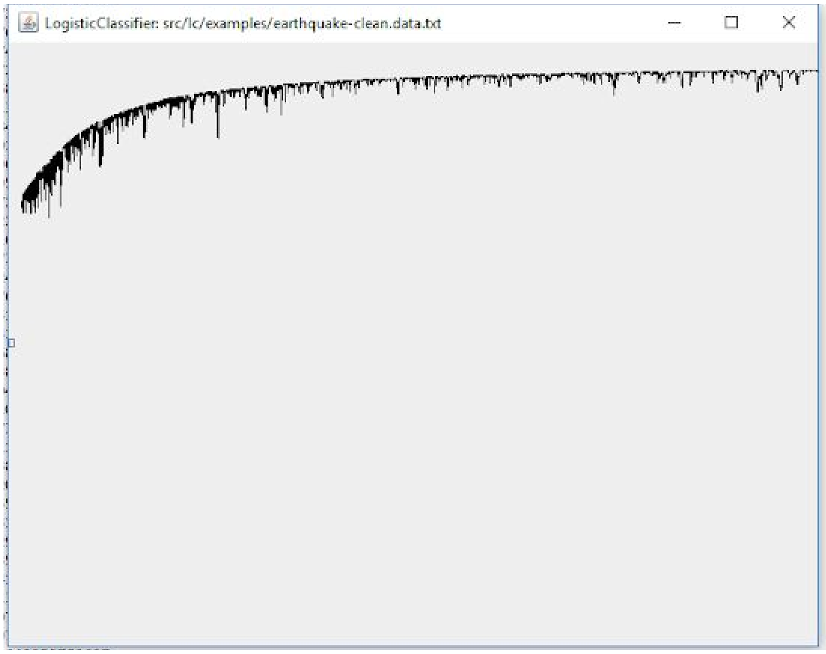
java lc/examples/PerceptronClassifierTest lc/examples/earthquake-noisy.data.txt 100000 0

Plot 3 shows the Perceptron Classifier with steps = 100000 and alpha = 0


PerceptronClassifier: src/lc/examples/earthquake-noisy.data.txt

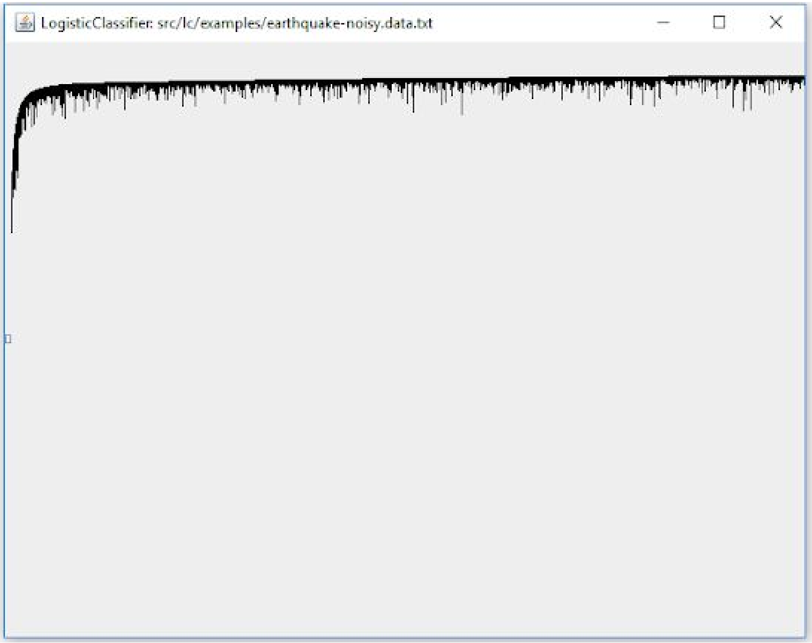
java lc/examples/LogisticClassifierTest lc/examples/earthquake-clean.data.txt 5000 0.05

Plot 4 shows the Logistic Classifier with steps = 5000 and alpha = 0.05


LogisticClassifier: src/lc/examples/earthquake-clean.data.txt

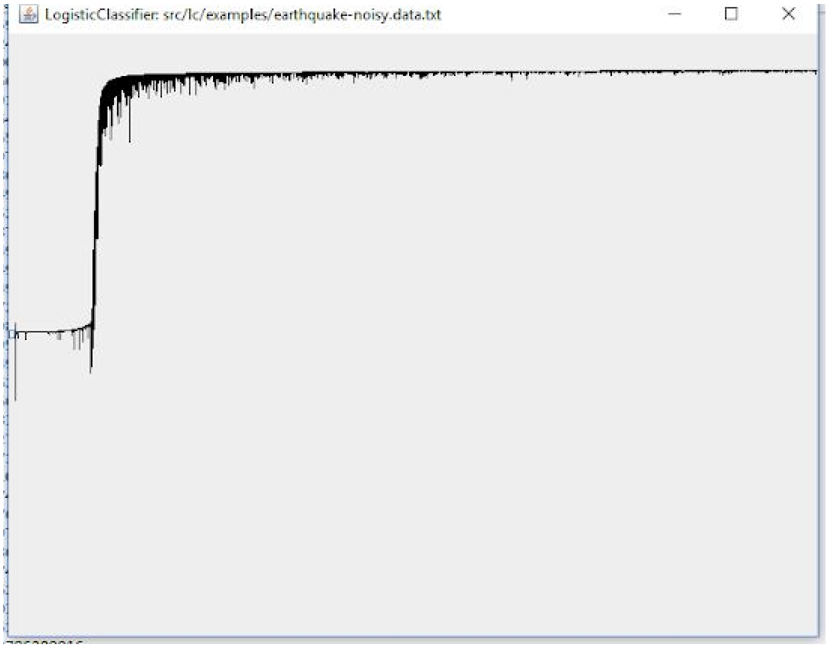
java lc/examples/LogisticClassifierTest lc/examples/earthquake-noisy.data.txt 100000 0.05

Plot 5 shows the Logistic Classifier with steps = 100000 and alpha = 0.05


LogisticClassifier: src/lc/examples/earthquake-noisy.data.txt

java lc/examples/LogisticClassifierTest lc/examples/earthquake-noisy.data.txt 100000 0

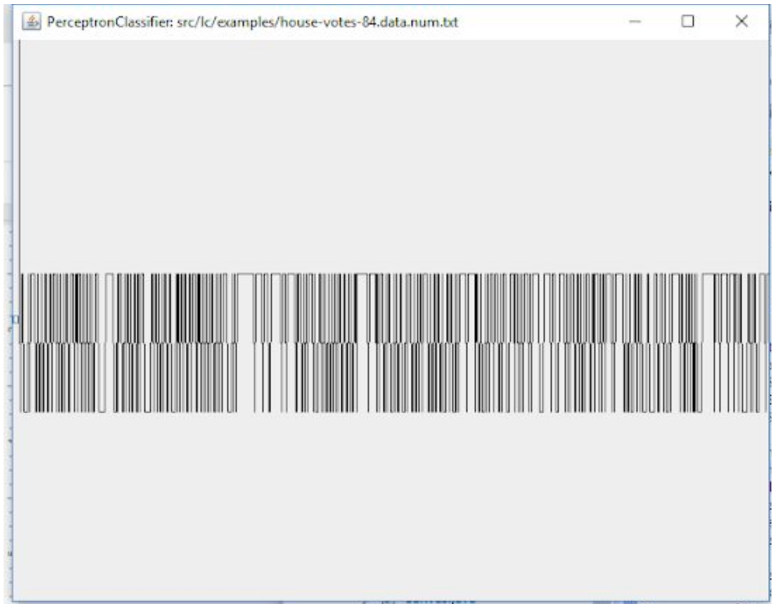
Plot 6 shows the Logistic Classifier with steps = 100000 and alpha = 0


LogisticClassifier: src/lc/examples/earthquake-noisy.data.txt

b. GRAPHS FOR HOUSE VOTES DATA

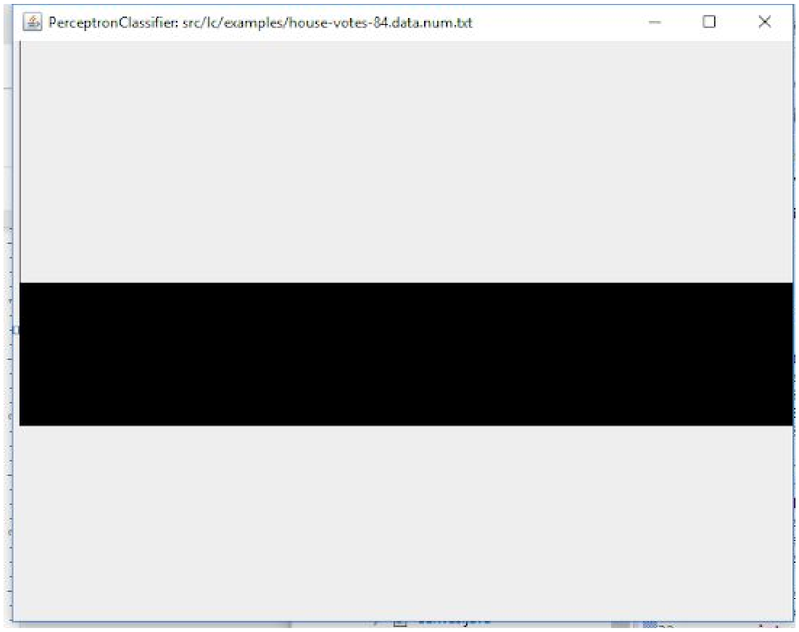
src/lc/examples/house-votes-84.data.num.txt 700 1

Plot 1 shows the Perceptron Classifier with steps = 700 and alpha = 1


PerceptronClassifier: src/lc/examples/house-votes-84.data.num.txt

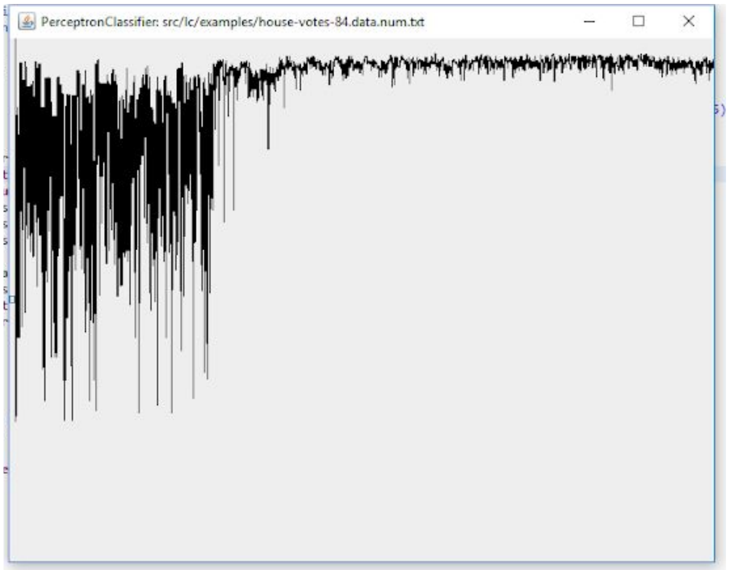
src/lc/examples/house-votes-84.data.num.txt 100000 1

Plot 2 shows the Perceptron Classifier with steps = 100000 and alpha = 1


PerceptronClassifier: src/lc/examples/house-votes-84.data.num.txt

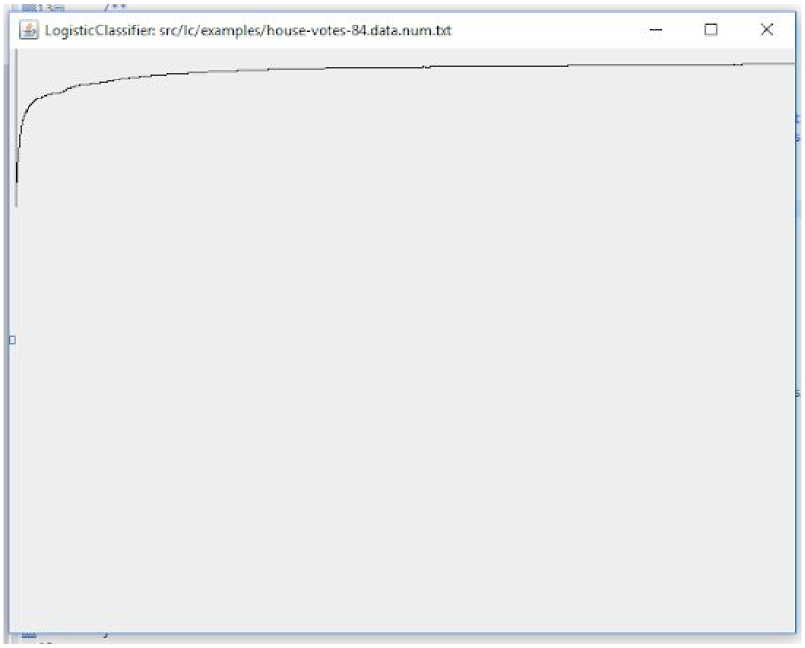
src/lc/examples/house-votes-84.data.num.txt 100000 0

Plot 3 shows the Perceptron Classifier with steps = 100000 and alpha = 0


PerceptronClassifier: src/lc/examples/house-votes-84.data.num.txt

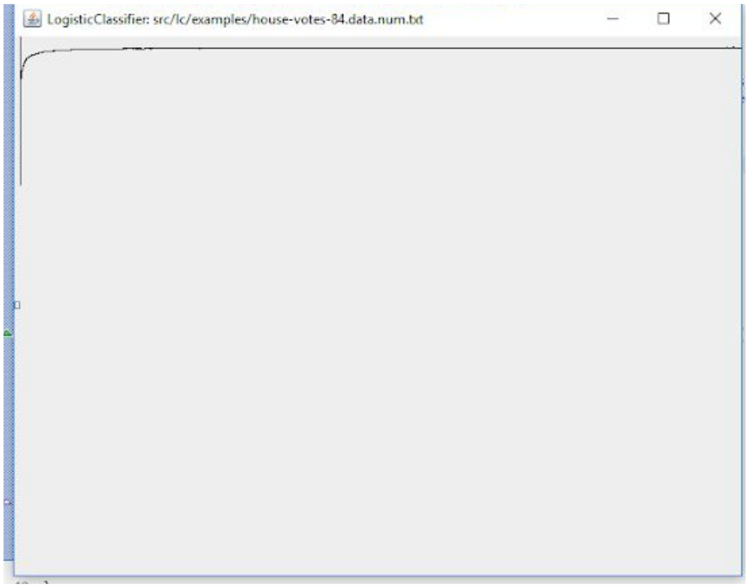
src/lc/examples/house-votes-84.data.num.txt 5000 0.05

Plot 4 shows the Logistic Classifier with steps = 5000 and alpha = 0.05


LogisticClassifier: src/lc/examples/house-votes-84.data.num.txt

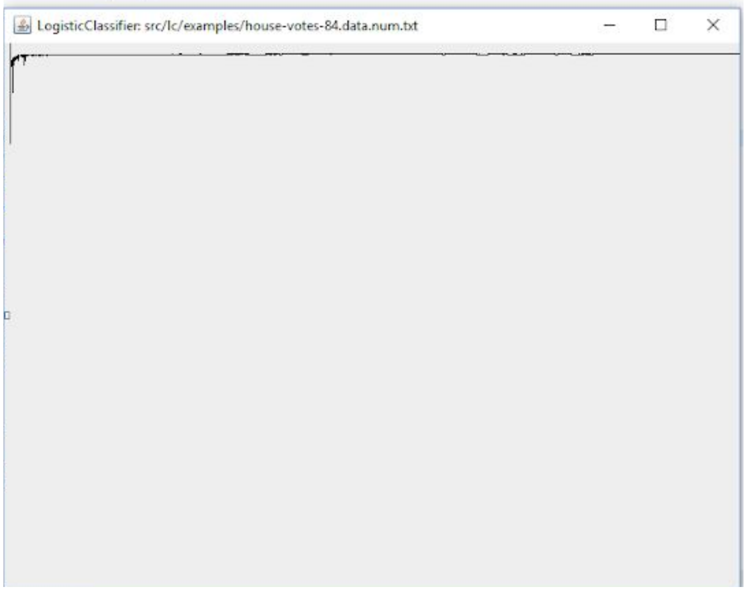
src/lc/examples/house-votes-84.data.num.txt 100000 0.05

Plot 5 shows the Logistic Classifier with steps = 100000 and alpha = 0.05


LogisticClassifier: src/lc/examples/house-votes-84.data.num.txt

src/lc/examples/house-votes-84.data.num.txt 100000 0

Plot 6 shows the Logistic Classifier with steps = 100000 and alpha = 0


LogisticClassifier: src/lc/examples/house-votes-84.data.num.txt