Write up
Project 2

1. Nearest Neighbors

Using the following training data provided in nearest neighbors 1.csv, how would your algorithm classify the test points listed below with K=1, K=3, and K=5?

Test	Sample	Label	K=1	K=3	K=5
$test_1$	(1,1)	1	1	1	1
$test_2$	(2,1)	-1	-1	1	1
$test_3$	(0,10)	1	1	1	1
$test_4$	(10,10)	-1	-1	-1	-1
$test_5$	(5,5)	1	1	-1	1
$test_6$	(3,10)	-1	-1	1	-1
$test_7$	(9,4)	1	1	-1	-1
$test_8$	(6,2)	-1	-1	1	1
$test_9$	(2,2)	1	1	1	1
$test_{10}$	(8,7)	-1	-1	1	-1

Table 1: nearest_neighbors_1.csv

The best K value for the above training data is 1.

2. Clustering

When K = 2, we get two cluster centers and when K = 3, we get three cluster centers.

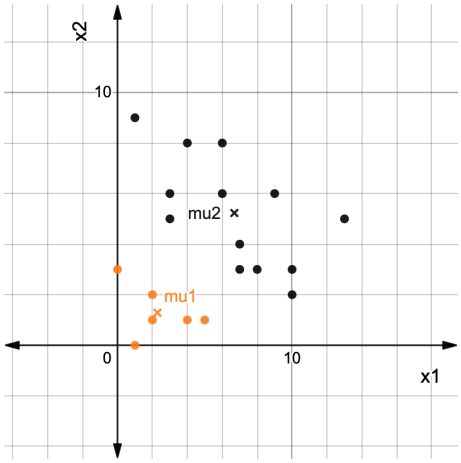

Figure 1: K=2

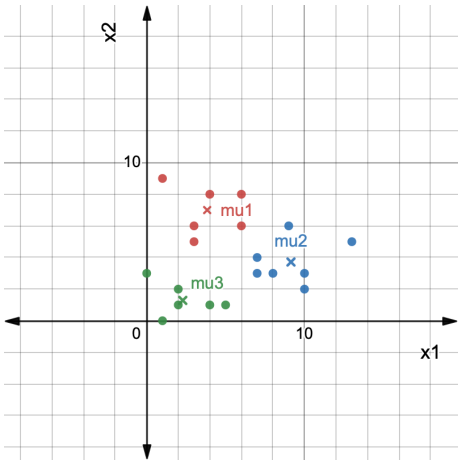

Figure 2: K=3

3. Perceptron

After training the perceptron on the dataset provided in perceptron_2.csv, we get the below decision boundary for the w and b values mentioned.

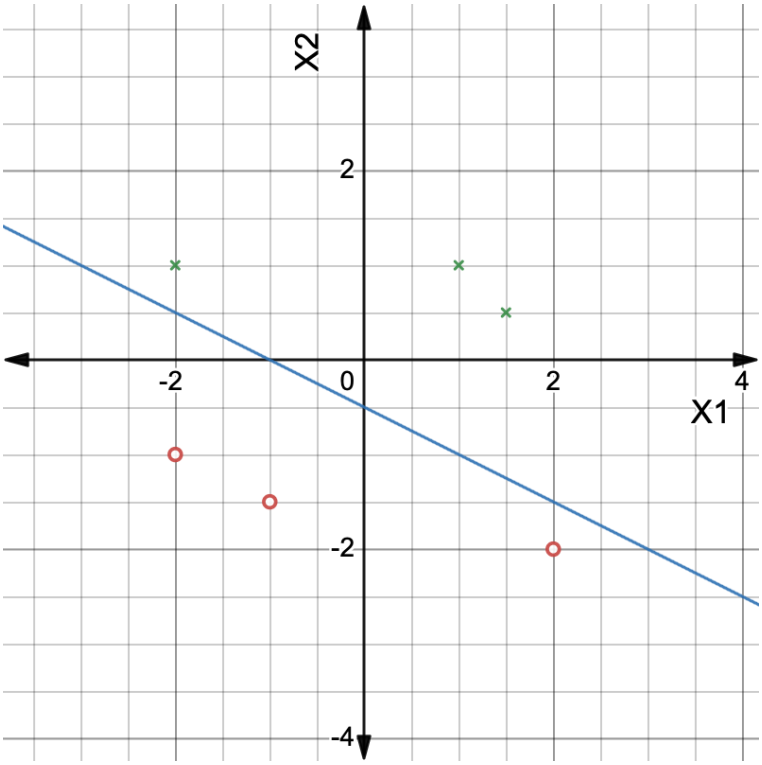

Figure 3: w_1=2; w_2=4; bias=2