Kyler Little

CPT\_S 437

**Homework #1**

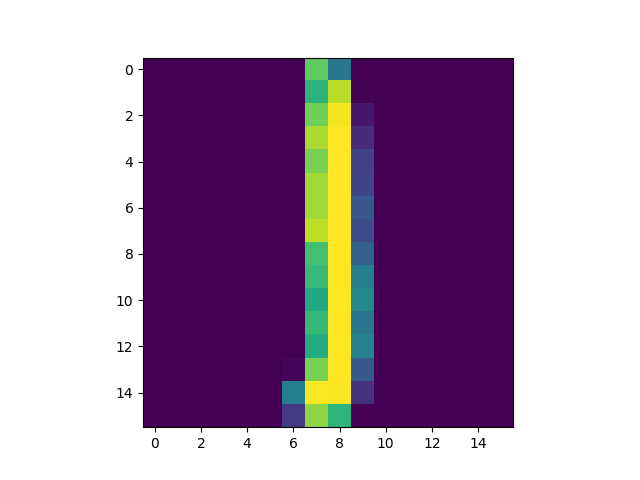
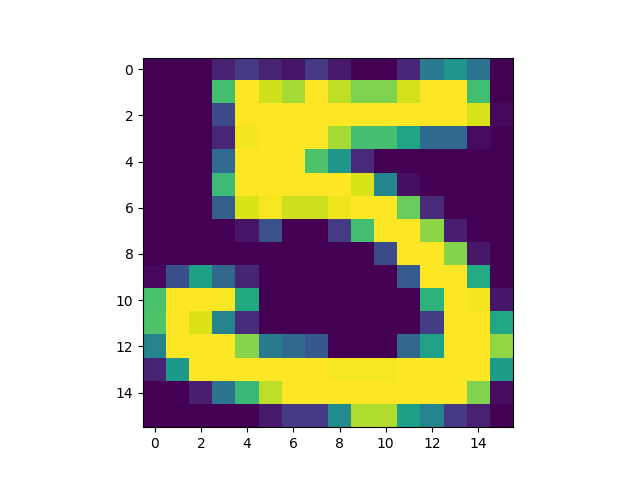
1.) Consider the perceptron in two dimensions: where and . Technically, has three coordinates, but we call this perceptron two-dimensional because the first coordinate is fixed at 1.

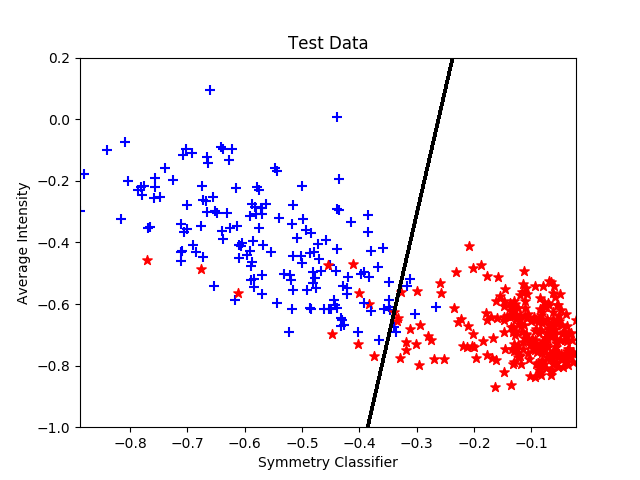
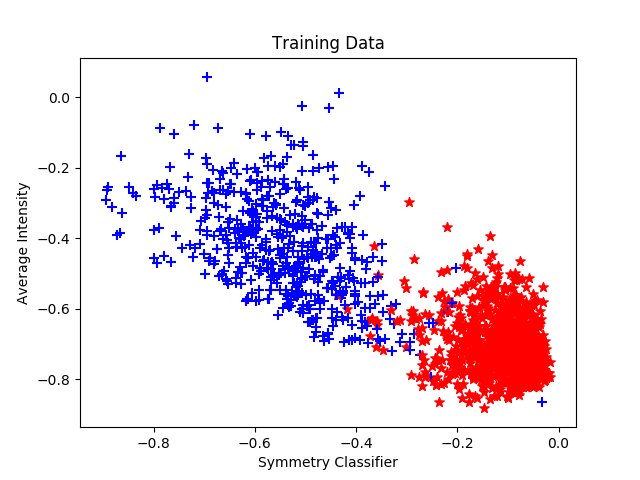
(a) Show that the regions on the plane where and are separated by a line. If we express this line by the equation , what are the slope and intercept in terms of ?

(b) Draw a picture for the cases and .

In more than two dimensions, the and regions are separated by a hyperplane, the generalization of a line

2.) Summarize results…





3.) Given , , show that the rank of matrix is one.

4.)