1 Exercise 1

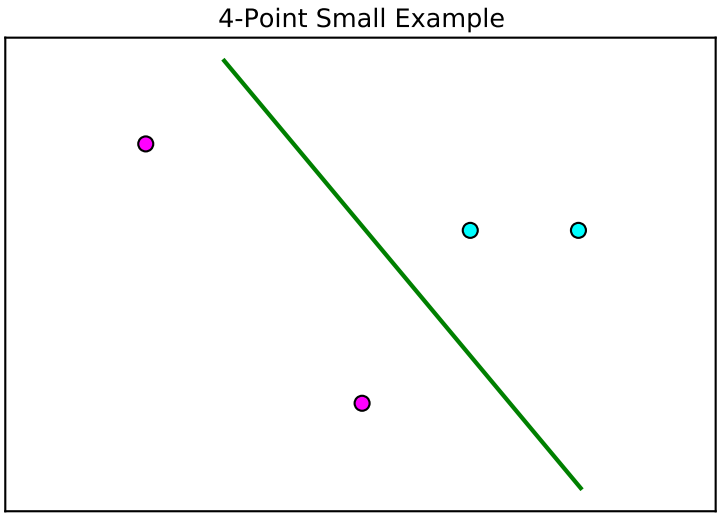

Figure 1: Something

1.2 - since smallOverlap was the same, took half the data for test and half for train

2.2: * do training set over some values of lambda * use that to pick lambda * test on 'validation' data and report an error value

2.3: will need to plot lambda versus sparsity

2.4: * do training set over some values of bandwidth with lambda = 0 * do validation set over some values of lambda * test on test and report results

2.5: * will need to think about this a little bit more.

3.1: * https://piazza.com/class/hzdfawvtilo7hf?cid=434 * L2 regularization, linear case * http://blog.datumbox.com/machine-learning-tutorial-the-multinomial-logistic-regression-softmax-regression/

* maybe need to save coefficients or predictions or something?

3.1 - LR: * 2 features, 100 pts, 2 classes, l = 0.01 -¿ error = .485 * might need to randomly select subsets of data points

* tips for getting numerics to work better: * normalize data beforehand (then don't forget to re-normalize later) *

3.2 - multiclass SVM: * used http://scikit-learn.org/stable/modules/generated/sklearn.svm.LinearSVC.html * can do this SO FAST it doesn't even make sense to try to do this by myself. * tried an array of l values with L1 loss (multiclasssvm.py), best L with random partitioning of data into 3 sets. rigorous stopping criteria * hinge loss, l2 regularization: * validation error: .187 * test error: .261 * l: 0.01 * squared loss, l1

regularization: * validation error: .143 * test error: .143 * l: 7e-7