6.867: Homework 3

1. Neural Networks

In this section, we explore logistic regression with L1 and L2 regularization. We use gradient descent to compare the resulting weight vectors under different regularizers and regularization parameters, and we evaluate the effect of these choices in the context of multiple data sets.

1.1. ReLU + Softmax

1.2. Initialization

1.2.1. Regularization

1.2.2. Binary classification

1.2.3. Multi-class classification

2. Convolutional Neural Networks

In this section, we explore various versions of the dual form of support vector machines, first with slack variables and then with generalized kernel functions.

2.1. Convolutional filter receptive field

2.2. Run the Tensorflow conv net

2.3. Add pooling layers

2.4. Regularize your network!

2.5. Experiment with your architecture

2.6. Optimize your architecture

2.7. Test your final architecture on variations of the data