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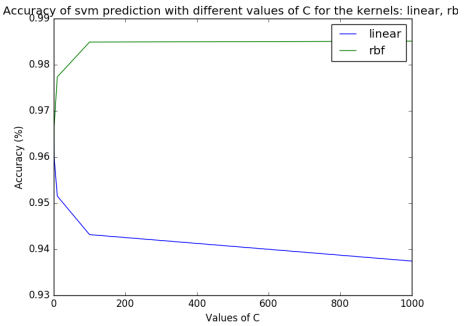
CSCI 5622
Homework 3: SVM

1. **Different values of C and two kernels**
   I used 5 different values of regularization parameter C: 0.1, 1, 10, 100, 1000. I used two different kernels: linear, radial basis function. For each kernel I used all five values of C. I determined the accuracy for each value of C and kernel by using 3-fold cross validation with just the original training set. The accuracy for each value of C and kernel is the mean of the accuracies for all of the cross validation folds.

   As can be seen in the figure below, the radial basis function kernel did better than the linear kernel for all values of C. Increasing values of C, increased the accuracy of the radial basis function kernel while decreasing the accuracy of the linear kernel.



2. **Examples of support vectors for each class**
   Example of three support vectors for the 3's class:

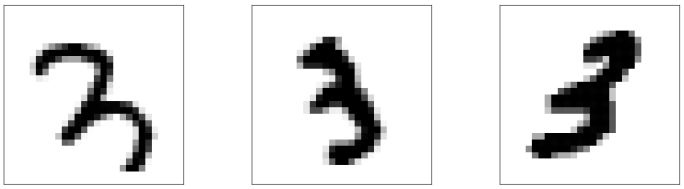


Figure 1: 3's support vectors

Example of three support vectors for the 8's class:

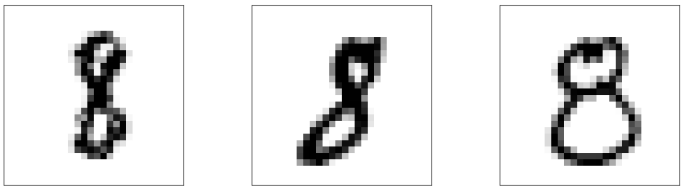


Figure 2: 8's support vectors