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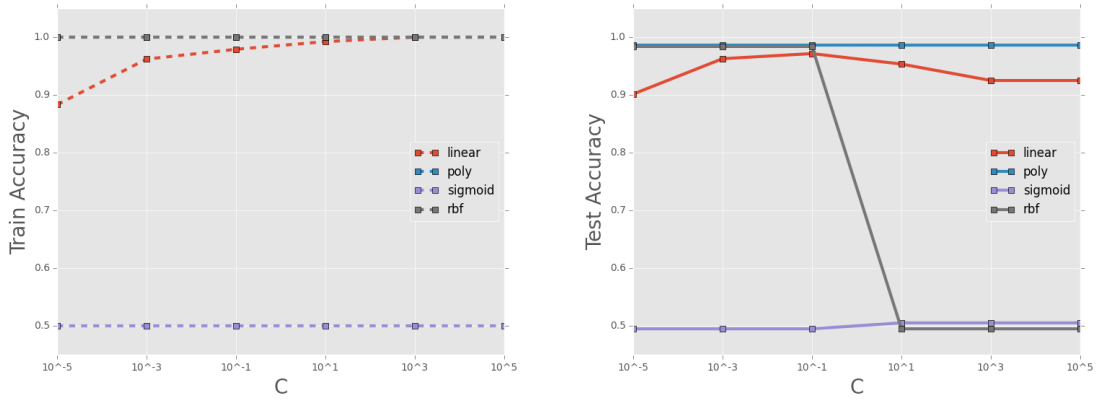
CSCI 5622 – Homework 4 – SVM

Various kernels and parameters tested:

- Linear, C = 10^[-5,-3,-1,1,3,5]
- Poly, degree 3, gamma 10, C = 10^[-5, -3, -1, 1, 3, 5]
- Sigmoid, gamma 10, C = 10^[-5, -3, -1, 1, 3, 5]
- RBF, gamma 10, C = 10^[-5, -3, -1, 1, 3, 5]

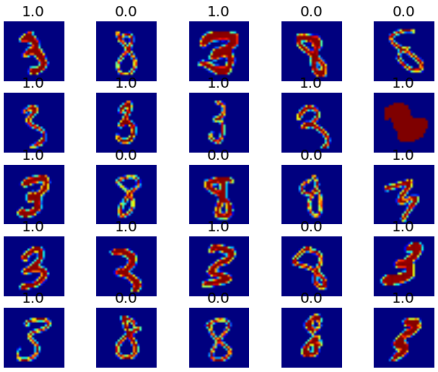
Train and Test performance of various kernels as a function of C:



These results suggest the problem is best solved in a polynomial kernel, and the higher dimensional kernels have a good chance of over-fitting test data. This can be seen in the increase in test error with an increase in C. Increasing values of C increases intolerance to errors in the training set, which increases training accuracy but here shows dramatic over-fitting in the RBF kernel, and modest over-fitting in the linear kernel.

Examples of Support Vectors

Linear, C=10^-1



Poly^3, C=10^5