Machine Learning E16 - Handin 2
OCR with SVM and (Deep) Neural Nets

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1 SVM with SciKit-Learn

FiXme Fatal: describe which kernels we have tried

FiXme Fatal: should we measure or mention training time? (mention multithreaded solution?)

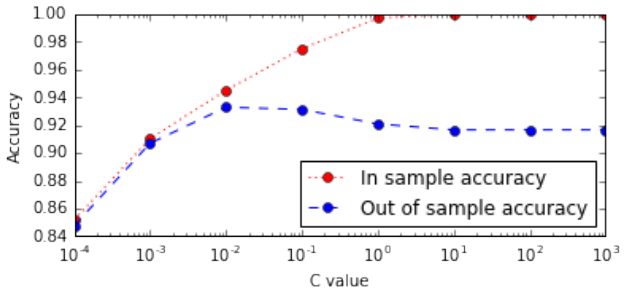

Figure 1: SVM performance with a simple linear kernel for various C values(cost).

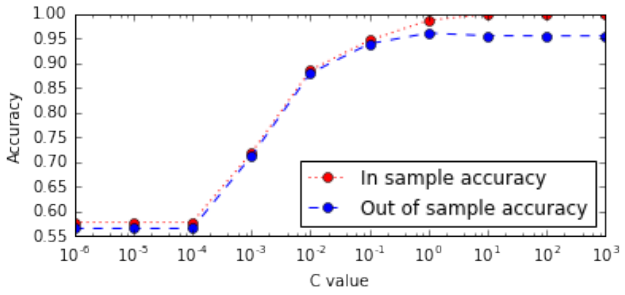

Figure 2: SVM performance with a second-order polynomial kernel for various C values(cost).

2 Neural Nets with TensorFlow

- training time - results

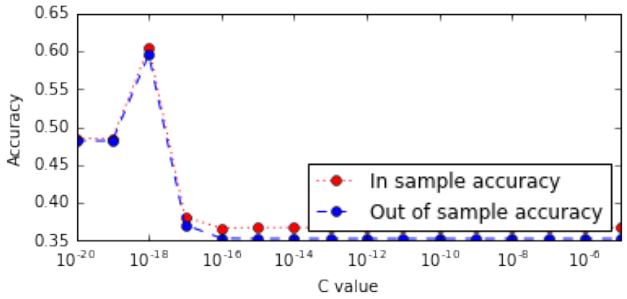

Figure 3: SVM performance with a third-order polynomial kernel for various C values(cost).

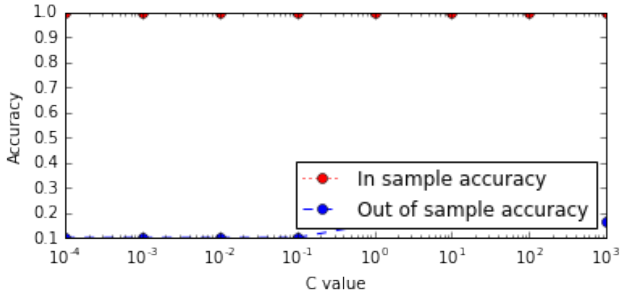

Figure 4: SVM performance with a RBF kernel with $\gamma = 0.01$ for various C values(cost).

Table 1: Classification accuracy of digits with different kernels for the found optimal hyperparameters.

SVM kernel	Validation accuracy	Training accuracy	C-value
Linear	93.29%	94.52%	0.01
2th order poly.	96.16%	98.74%	1
3rd order poly.	0%	0%	??
RBF, $\gamma = 0.01$	96.94%	99.98%	10

3 Making the best classifier in 2016 ML Class

- describe image augmentation (or what we have done to achieve better data for training) - illustrate network - results

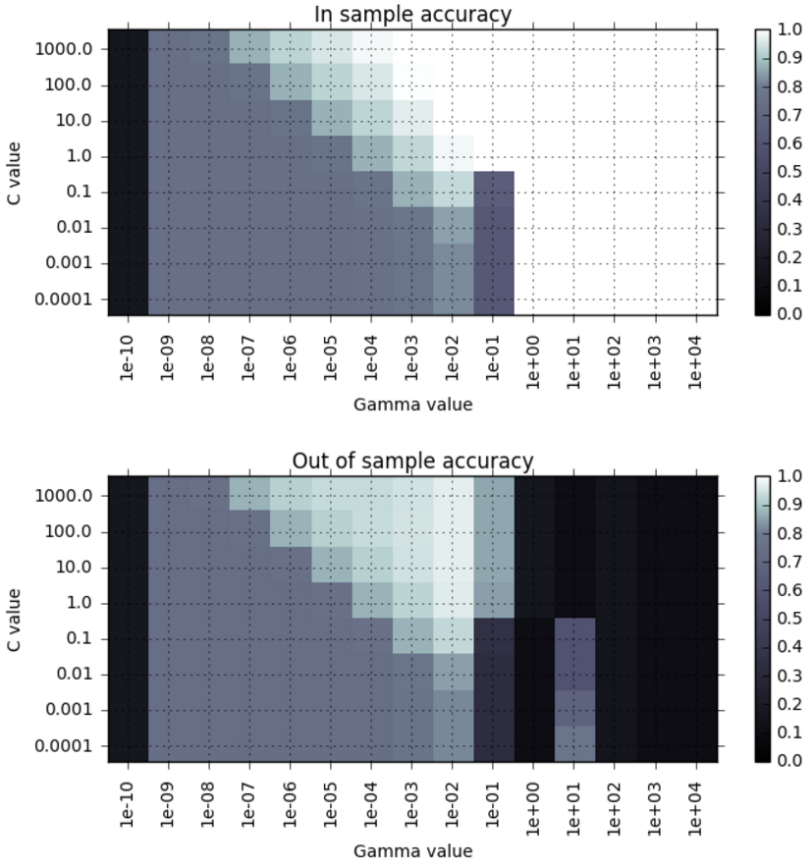

Figure 5: Classification accuracy with a RBF kernel with various γ- and C values(cost).

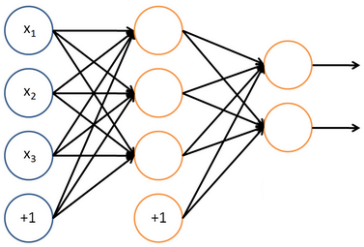

Figure 6: Illustration of a small NN, with one hidden layer. The input vector consists of the 784 pixel values for an image, the hidden layer has 1024 nodes, and the output layer has 10 nodes, one for each digit-class. Biases are added for both computational layers.