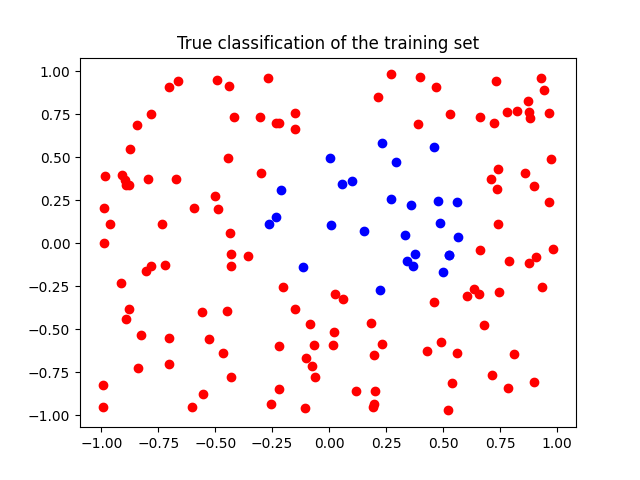
Introduction to Computational Learning Theory – HW 3

מגישים:

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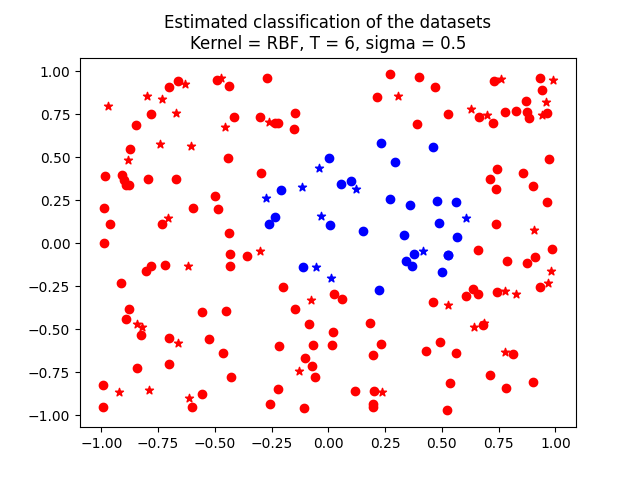
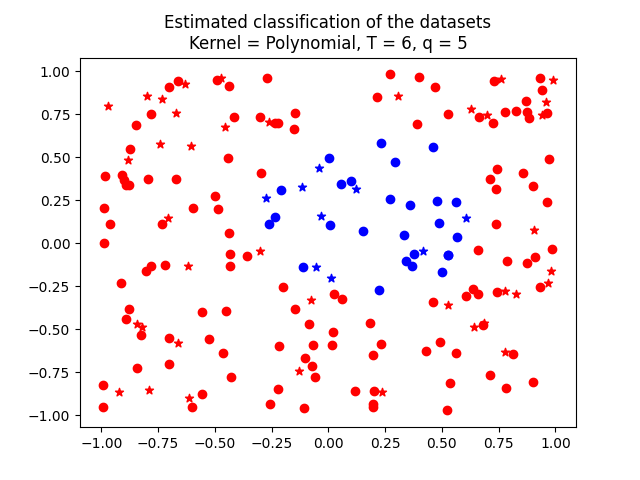
1. We loaded the training dataset and displayed it by using the matplotlib Python library:



Blue dots represent a sample with a label of 1, and red dots represent a sample with a label of -1.

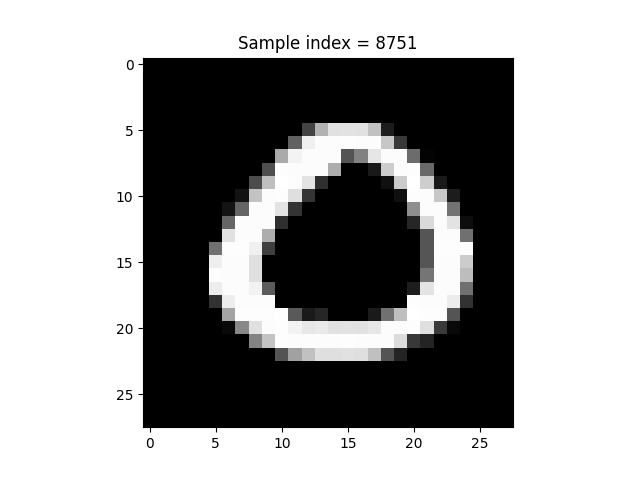
By using a loop to iterate over different combinations of values for the algorithm parameters (*q*, *T* and ), we found one which achieved 0 empirical error:

*q* = 5, *T* = 6, = 0.5.  
  
The following plots show the estimated labels as produced by the Perceptron algorithm, using the RBF and polynomial kernels:



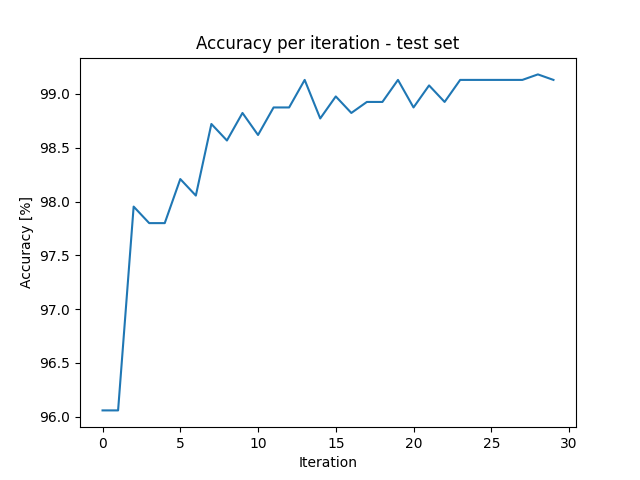
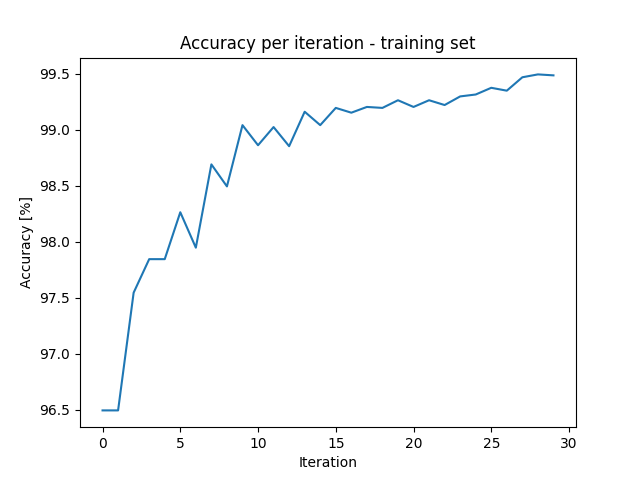
The star markers represent samples from the test dataset.

2.1. This is an image of a random sample from the train set:



2.2. We implemented the AdaBoost algorithm using the class of weak learners defined in the exercise. As suggested, in order to speed up the learning loop, we calculated the error probability of each weak learner only if there exists a sample from the training set with a value of in pixel .

These are the plots of the algorithm accuracy in each iteration for both data sets:



As we can see, the algorithm achieved high accuracy rate and converged quickly.