Homework 6, due October 24th, 11:59pm

October 2, 2018

1. Implement the FSA variable selection method for linear models and binary classification with the Lorenz loss, as described in class. Use the parameters $s = 0.001, \mu = 100, N^{iter} = 500$. Take special care to **normalize each column** of the X matrix to have zero mean and variance 1 and to use the same mean and standard deviation that you used for normalizing the train set also for normalizing the test set.

a) Using the `Gisette` data, train a FSA classifier on the training set, starting with $\boldsymbol{\beta}^{(0)} = 0$ to select $k \in \{10, 30, 100, 300\}$ features. Plot the training loss vs iteration number for $k = 10$. Report in a table the misclassification errors on the training and test set for the models obtained for all these k. Plot the misclassification error on the training and test set vs k. (5 points)

b) Repeat point a) on the `dexter` dataset. (3 points)

c) Repeat point a) on the `madelon` dataset. (2 points)