

00102892: Statistical Learning Lab 1

Due: December 5, 2018

1. Implement the Lasso for linear regression using any algorithm (coordinate descent, ADMM, proximal gradient descent, etc.) and any programming language (R, Python, MATLAB, etc.) of your own choice.
 - (a) Describe your algorithm and print out the source code.
 - (b) Test your program on a simulation study of size at least $n = 100$ and $p = 5000$. Produce the solution path for 100 λ values. Refer to Friedman, Hastie and Tibshirani (2010, Sec. 5.1, <https://www.jstatsoft.org/article/view/v033i01/>) for the generation of simulated data.
 - (c) Compare the run time of your program with a state-of-the-art software package (e.g., `glmnet` in R). Comment on how you could improve your program.
2. Exercise 6.12 of ESL. In addition, describe and implement a method to choose the optimal bandwidth.