Complementary assignment for Akshaya:

File step.csv represents the data generated by some process.

1. Use optimization methods to fit the following model

(1)

by least-squares, where are parameters. Comment how different optimization methods worked, how starting point affected the results.

1. Construct a permutation test to check vs
2. Use acceptance-rejection method to generate from Laplace distribution by using Normal distribution as a majorizing function.
3. Assume that residuals in the model (1) come from the model . Implement a Metropolis-Hastings sampler that uses normal distribution as proposal distribution and generates from posterior distribution of , check trace plots, check posterior distribution. Find the posterior mean of
4. Use model (1) to and bootstrap to construct confidence intervals for