MPCS 58020 2015 Homework 3

Assignment date: July 25, 2015

Due date: Aug 8, 2015

Solve the following problems. Send solutions (programs, results, and analytical results) to the TA (rahaman@cs.uchicago.edu) with the subject line "[MPCS 58020 2015] HW3".

1. Derive expressions for the following:
   - The covariance and correlation of an AR(1) process
   - The covariance and correlation of an MA(1) process

2. Show that the principal components in a PCA transformation maximize the variance in each coordinate direction (given orthogonality constraint).

3. Shumway Problem 3.10

4. Shumway Problem 3.18

5. Shumway Problem 7.12

6. Shumway Problem 3.20

7. Shumway Problem 3.21

8. Shumway Problem 3.22

9. Shumway Problem 3.36

10. Shumway Problem 3.37