STAT 153. Homework # 3

DUE by 9/30/2016 before LAB

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1. (2 pts) Problem 3.7 (a) & (b) (Shumway & Stoffer Textbook page 164)

2. (2 pts) Problem 3.11 (Shumway & Stoffer Textbook page 165)

3. (2 pts) Problem 3.15 (Shumway & Stoffer Textbook page 166)

4. (2 pts) Consider AR(2) process as follow,

$$X_t = \phi_1 X_{t-1} + \phi_2 X_{t-2} + W_t,\ W_t \sim N(0,1)$$

   (a) Find the values of ϕ_1, ϕ_2 such that X_t is stationary.

   (b) Let $\phi_1 = 1/3$ and $\phi_2 = 2/9$ and show that the ACF of X_t is given by

$$\rho(h) = \frac{16}{21}\left(\frac{2}{3}\right)^{|h|} + \frac{5}{21}\left(-\frac{1}{3}\right)^{|h|}, h = 0, \pm 1, \pm 2, \cdots .$$

5. (2 pts) Find the partial ACF of the AR(2) process given by

$$X_t = \frac{1}{3}X_{t-1} + \frac{2}{9}X_{t-2} + W_t,\ W_t \sim N(0,1).$$

   Note: You could use what you find out from Q4.