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ATSA

Exercise 3.1.2

$$X(t) = a(t) + 0.2(a(t-1)) - .48(a(t-2))$$

$\rho_0 = 1$

$\rho_3 = 0$

$$\rho_k = \frac{-\theta_k + \sum_{j=1}^{q-k} \theta_j \theta_{j+k}}{1 + \sum_{j=1}^{q} \theta_j^2} \qquad k = 1, 2, \ldots, q$$

$= 0, \quad k > q$

$q = 2$

$$\rho_k = \frac{-\theta_k + \sum_{j=1}^{2-k} \theta_j \theta_{j+k}}{1 + \sum_{j=1}^{2} \theta_j^2}$$

$$\rho_1 = \frac{.2 + \sum_{j=1}^{1} \theta_j \theta_{j+1}}{1 + \sum_{j=1}^{2} \theta_j^2}$$

$\sum_{j=1}^{1} \theta_j \theta_{j+1} = \theta_1 \cdot (\theta_2)$

$(-.2)(.48) = -.096$

$\sum_{j=1}^{2} \theta_j^2$

$\theta_2^2 \cdot \theta_1^2 = (.2)^2 (.48)^2 = .2704$

$$\rho_1 = \frac{.2 + -.096}{1 + .2704} = .08186$$

$$\rho_2 = \frac{-.48 + \sum_{j=1}^{0} \theta_j \theta_{j-k}}{1 + \sum_{j=1}^{2} \theta_j^2}$$

$$\rho_2 = \frac{-.48}{1 + .2704} = -.3778$$