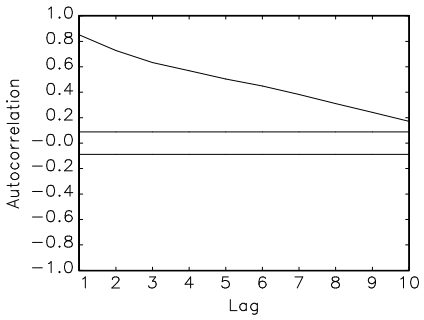
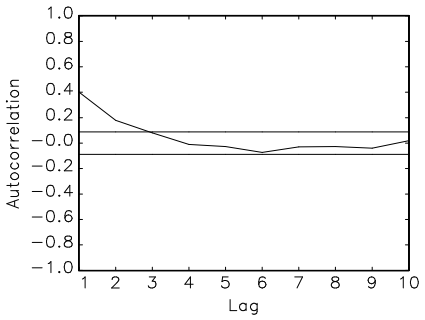
A 1: Assign to the following ACF graphs the appropriate stochastic process.

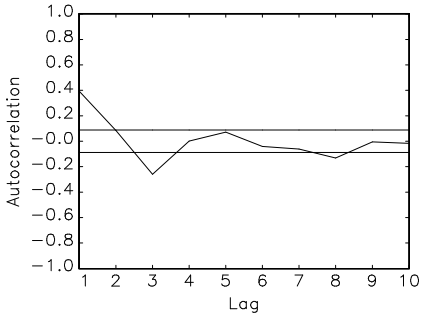
(1)



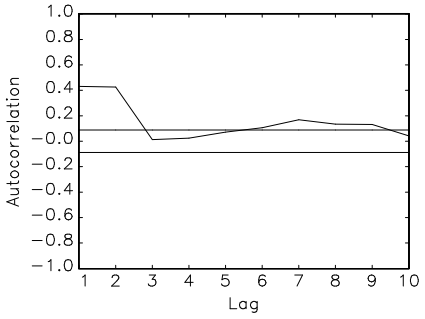
(2)



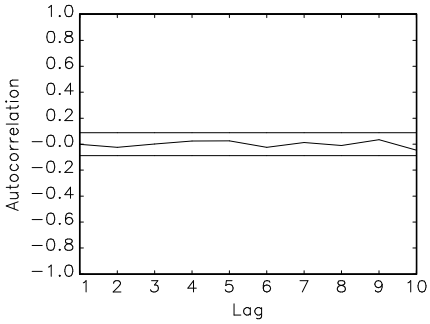
(3)



(4)



(5)



a) $Y_t = 0.5\varepsilon_{t-4}$ ____ b) $Y_t = 0.5\varepsilon_{t-1} + 0.7\varepsilon_{t-2} + \varepsilon_t$ ____

c) $Y_t = 0.4Y_{t-1} + \varepsilon_t$ ____ d) $Y_t = 0.9Y_{t-1} + \varepsilon_t$ ____

e) $Y_t = \varepsilon_t$ ____ f) $Y_t = 0.7\varepsilon_{t-1} + 0.6\varepsilon_{t-2} - 0.3\varepsilon_{t-3} + \varepsilon_t$ ____

A 2: Are the following stochastic processes stationary and ergodic Argue why (or why not)

(1) $Y_t = 0.9Y_{t-1} + 0.1Y_{t-2}\varepsilon_t$

(2) $Y_t = 0.3Y_{t-1} + 0.3\varepsilon_{t-1} + \varepsilon_t$

(3) $Y_t = 0.4Y_{t-1} + 0.5Y_{t-1} + 0.1\varepsilon_{t-1} + 0.5\varepsilon_{t-2}\varepsilon_t$

(4) $Y_t = Y_{t-1} + \varepsilon_t$

(5) $Y_t = 0.3\varepsilon_{t-1} + 0.2\varepsilon_{t-2} + 0.1\varepsilon_{t-3} + \varepsilon_t$

A 3: Decide, based on the Eigenvalues of the matrix $\mathbf{F}$, whether the respective AR processes are stationary and ergodic.

(1) $\mathbf{F} = \begin{pmatrix} 0.6 & -0.4 \\ 1 & 0 \end{pmatrix}$, (2) $\mathbf{F} = \begin{pmatrix} 0.4 & 0.8 & -0.3 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \end{pmatrix}$, (3) $\mathbf{F} = \begin{pmatrix} 1.2 & -0.1 \\ 1 & 0 \end{pmatrix}$

mit	mit	mit
$\lambda_1 = 0.30 + 0.55677644i$	$\lambda_1 = 0.91584462$	$\lambda_1 = 1.1099020$
$\lambda_2 = 0.30 - 0.55677644i$	$\lambda_2 = -0.88568851$	$\lambda_2 = 0.090098049$
	$\lambda_3 = 0.36984389$	