## Examples ARMA(p, q) process

Consider the following ARMA(礼物) 欧军管辅导

$$y_t = 2 + 0.5 y_{t-1} + 0$$
  $\varepsilon_t \sim N(0,1), \qquad T = 100$  This is a stationary set  $\varepsilon_t \sim N(0,1)$ .

## **Properties**

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► The expected valuesisngiven Project Exam Help

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$$(163.00 \text{ m}) = 4$$
  
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► The variance is given by https://tutorcs.com

$$\gamma_0 = \frac{1 + \beta_1^2 + 2\alpha_1\beta_1}{1 - \alpha_1^2}\sigma^2 = \frac{1 + 0.9^2 + 2 \times 0.5 \times 0.9}{1 - 0.5^2} = 3.6133$$

► The ACF is given by

 $\rho_2 = \alpha_1 \rho_1 = 0.5$  $\rho_3 = \alpha_1 \rho_2 = 0.5 \text{ m}$ 

 $\rho_4 = \alpha_1 \rho_3 = 0.5 \times 0.1873 = 0.0936$ 

 $\rho_1 = \frac{(1 + \alpha_1 \beta_1) (\rho_1 + \beta_2)}{1 + \beta_1^2 + 2\alpha_1 \beta_1} (1 + 0.5 \times 0.9) (0.5 + 0.9)}{1 + 0.9^2 + 2 \times 0.5 \times 0.9} = 0.7491$ 

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Figure 46: Theoretical ACF and PACF of generated ARMA(1,1) process



Figure 47: Dynamic impact of a shock  $\varepsilon_t$  on y

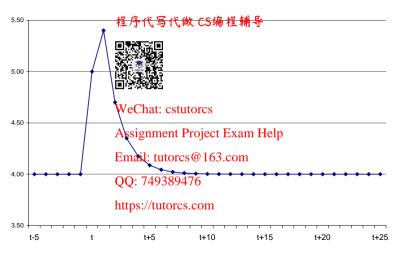


Figure 48: A generated ARMA(1,1) process



Figure 49 : Sample ACF and PACF of generated ARMA(1,1) process

