HW4 : Stationary Bootstrap
(due 2011/05/09)

Suppose X_t follows an AR(1) process :

$$X_t = \rho X_{t-1} + \varepsilon_t, \; t = 1, 2, 3 \dots n,$$
$$\text{where } X_t \sim N(0, 1), \; \varepsilon_t \sim N(0, 1), \quad |\rho| < 1.$$

We follow instructions in Example 6.1 in Professor Kuan's lecture on bootstrap, and simulate the coverage rate of 95% confidence intervals of mean μ. In our simulations, we set sample size n = 200 and consider ρ = 0, 0.3, 0.6, 0.9 and Q = 0, 0.5, 0.7, 0.9, 0.95. Set R = 1000, B = 1000. Please tabulate results and explain what you see.
(Note that stationary bootstrap is equal to i.i.d. bootstrap when Q = 0.)

● Algorithm of Stationary Bootstrap Method :
   (Explain in the b-th bootstrap)

Step-1 : Randomly select an observation, say x_t, from the data x_n. Indicate this x_t as $x_{1,b}^*$

Step-2 :
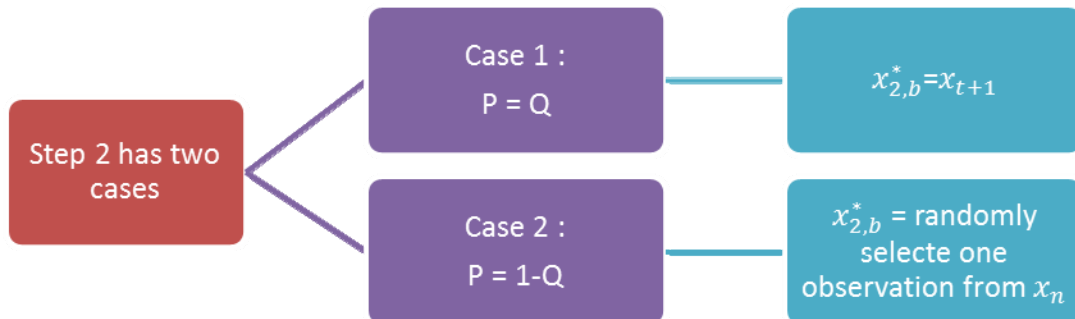
Step-3 : Repeat Step-2 n times, then you will get a sequence of $x_b^* = \{x_{1,b}^*, x_{2,b}^*, x_{3,b}^* \dots, x_{n,b}^*\}$