Assignment-8

Obtain data of a variable at least for 5 stations located in a certain study area and

1. Draw the Independence Function which is a graph relating cross correlation coefficient (ρ) and distance between the stations in your study area.
2. Plot a contour map by considering correlation coefficient values as Regional Variable (RV) for lags from 1 to 5.
3. Generate synthetic hydrologic data using AR(1) model for the selected stations.
4. Generate synthetic hydrologic data using AR(2) model for the selected stations.
5. Predict values of stations from two nearby stations using AR(2) models.

    Remark; use the following general equation for question 5

$$\begin{bmatrix} x_t^1 \\ x_t^2 \\ \vdots \\ x_t^n \end{bmatrix} = \begin{bmatrix} a_{11} & \cdots & a_{1n} \\ \vdots & \ddots & \vdots \\ a_{n1} & \cdots & a_{nn} \end{bmatrix} x \begin{bmatrix} x_{t-1}^1 \\ x_{t-1}^2 \\ \vdots \\ x_{t-1}^n \end{bmatrix} + \begin{bmatrix} b_{11} & \cdots & b_{1n} \\ \vdots & \ddots & \vdots \\ b_{n1} & \cdots & b_{nn} \end{bmatrix} x \begin{bmatrix} \varepsilon_t^1 \\ \varepsilon_t^2 \\ \vdots \\ \varepsilon_t^n \end{bmatrix}$$