Neumann Series :-

$$B = \begin{bmatrix} 0.9 & -0.2 & -0.3 \\ 0.1 & 1.0 & -0.1 \\ 0.3 & 0.2 & 1.1 \end{bmatrix}$$

Let, $A = I - B$

$$= \begin{bmatrix} 0.1 & 0.2 & 0.3 \\ -0.1 & 0 & 0.1 \\ -0.3 & -0.2 & -0.1 \end{bmatrix}$$

$\|A\|_\infty = \max(0.6, 0.2, 0.6)$

$= 0.6$

thus, NS will converge to B^{-1}.

$$\sum_{k=0}^{0} A^k = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix} \qquad (\text{since } A^0 = I)$$

$$\sum_{k=0}^{1} A^k = \begin{bmatrix} 1.1 & 0.2 & 0.3 \\ -0.1 & 1 & 0.1 \\ -0.3 & -0.2 & 0.9 \end{bmatrix}$$

$$\sum_{k=0}^{2} A^k = \begin{bmatrix} A^0 + A^1 + A^2 \end{bmatrix} = \begin{bmatrix} 1.1 & 0.2 & 0.3 \\ -0.1 & 1 & 0.1 \\ -0.3 & -0.2 & 0.9 \end{bmatrix} +$$

$$\begin{bmatrix} -0.012 & -0.024 & -0.036 \\ 0.012 & 0 & -0.012 \\ 0.036 & 0.024 & 0.012 \end{bmatrix}$$

$$= \begin{bmatrix} 1.00 & 0.16 & 0.32 \\ -0.14 & 0.96 & 0.06 \\ -0.28 & -0.24 & 0.80 \end{bmatrix}$$

So on