Answer on Question #73894 – Math – Quantitative Methods

Question

Find the inverse of the matrix A =[1 - 1 1, 1 - 2 4, 1 2 2] by gauss Jordan method.

Solution

$$A = \begin{matrix} 1 & -1 & 1 \\ 1 & -2 & 4 \\ 1 & 2 & 2 \end{matrix} \qquad I = \begin{matrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{matrix}$$

1) $a_{1j}^1 = \frac{a_{1j}}{a_{11}}; \qquad b_{1j}^1 = \frac{b_{1s}}{a_{11}}$

$$A = \begin{matrix} 1 & -1 & 1 \\ 1 & -2 & 4 \\ 1 & 2 & 2 \end{matrix} \qquad I = \begin{matrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{matrix}$$

2) $a_{2j}^1 = a_{2j} - a_{1j}^1 a_{21}, \dots, a_{nj}^1 = a_{nj} - a_{1j}^1 a_{n1}$

$b_{2j}^1 = b_{2j} - b_{1j}^1 a_{21}, \dots, b_{nj}^1 = b_{nj} - b_{1j}^1 a_{n1}$

$$A = \begin{matrix} 1 & -1 & 1 \\ 0 & -1 & 3 \\ 0 & 3 & 1 \end{matrix} \qquad I = \begin{matrix} 1 & 0 & 0 \\ -1 & 1 & 0 \\ -1 & 0 & 1 \end{matrix}$$

3) $a_{2j}^1 = \frac{a_{2j}}{a_{22}} \qquad a_{ij}^1 = a_{ij} - a_{2j}^1 a_{i2}$

$b_{2j}^1 = \frac{b_{2s}}{a_{22}} \qquad b_{ij}^1 = b_{2j} - b_{ij}^1 a_{i2}$

$$A = \begin{matrix} 1 & -1 & 1 \\ 0 & -1 & 3 \\ 0 & 0 & 10 \end{matrix} \qquad I = \begin{matrix} 1 & 0 & 0 \\ 1 & -1 & 0 \\ -4 & 3 & 1 \end{matrix}$$

4) $a_{3j}^1 = \frac{a_{3j}}{a_{33}} \qquad a_{ij}^1 = a_{ij} - a_{3j}^1 a_{i3}$

$b_{3j}^1 = \frac{b_{3s}}{a_{33}} \qquad b_{ij}^1 = b_{ij} - b_{3j}^1 a_{i3}$

$$A = \begin{matrix} 1 & -1 & 1 \\ 0 & 1 & 3 \\ 0 & 0 & 1 \end{matrix} \qquad I = \begin{matrix} 1 & 0 & 0 \\ 1 & -1 & 0 \\ -0.4 & 0.3 & 0.1 \end{matrix}$$

5) $a_{ij}^1 = a_{ij} - a_{3j} a_{i3}$

$b_{ij}^1 = b_{ij} - b_{3j} a_{i3}$

$$A = \begin{matrix} 1 & -1 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{matrix} \qquad I = \begin{matrix} 1.4 & -0.3 & -0.1 \\ -0.2 & -0.1 & 0.3 \\ -0.4 & 0.3 & 0.1 \end{matrix}$$

6) $a_{ij}^1 = a_{ij} - a_{2j} a_{i2}$

$b_{ij}^1 = b_{ij} - b_{2j} a_{i2}$

$$A = \begin{matrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{matrix} \qquad I = \begin{matrix} 1.2 & -0.4 & 0.2 \\ -0.2 & -0.1 & 0.3 \\ -0.4 & 0.3 & 0.1 \end{matrix}$$

I – inverse of the matrix [1 -1 1; 1 -2 4; 1 2 2]