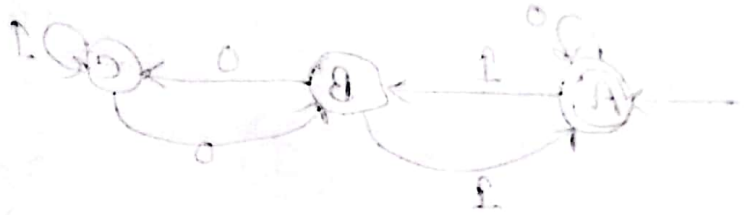


Gauss Jordan method:

$$x + y + z = 9$$

$$2x + 3y + 4z = 13$$

$$3x + 4y + 5z = 40$$



$$\begin{bmatrix} 1 & 1 & 1 \\ 2 & -3 & 4 \\ 3 & 4 & 5 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 9 \\ 13 \\ 40 \end{bmatrix}$$

$$[A:B] = \left[\begin{array}{ccc|c} 1 & 1 & 1 & 9 \\ 2 & -3 & 4 & 13 \\ 3 & 4 & 5 & 40 \end{array} \right]$$

$$= \left[\begin{array}{ccc|c} 1 & 1 & 1 & 9 \\ 0 & -5 & 2 & -5 \\ 0 & 1 & 2 & 13 \end{array} \right]$$

$$R_3 \rightarrow R_3 - 3R_1$$

$$R_2 \rightarrow R_2 - 2R_1$$

$$= \left[\begin{array}{ccc|c} 5 & 0 & 7 & 40 \\ 0 & -5 & 2 & -5 \\ 0 & 0 & 12 & 60 \end{array} \right]$$

$$R_1 = R_2 + 5R_3$$

$$R_3 = R_2 + 5R_3$$

$$= \left[\begin{array}{ccc|c} 60 & 0 & 0 & 60 \\ 0 & -60 & 0 & -180 \\ 0 & 0 & 12 & 60 \end{array} \right]$$

$$R_1 = 12R_3 - 7R_2$$

$$R_2 = 12R_3 - 2R_1$$

$$60x = 60 \Rightarrow x = 1$$

$$-60y = -180 \Rightarrow y = 3$$

$$12z = 60 \Rightarrow z = 5$$

Gauss Jordan method:

$$10x + y + z = 12$$

$$2x + 10y + z = 13$$

$$x + y + 5z = 7$$

$$\begin{bmatrix} 10 & 1 & 1 \\ 2 & 10 & 1 \\ 1 & 1 & 5 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 12 \\ 13 \\ 7 \end{bmatrix}$$

$$[A:B] = \left[\begin{array}{ccc|c} 1 & 1 & 5 & 7 \\ 2 & 10 & 1 & 13 \\ 10 & 1 & 1 & 12 \end{array} \right]$$

$$= \left[\begin{array}{ccc|c} 1 & 1 & 5 & 7 \\ 0 & 8 & -9 & -1 \\ 0 & -9 & -49 & -58 \end{array} \right]$$

$$R_2 = R_2 - 2R_1$$

$$R_3 = R_3 - 10R_1$$

$$= \left[\begin{array}{ccc|c} -8 & 0 & -49 & -57 \\ 0 & 8 & -9 & -1 \\ 0 & 0 & -473 & -473 \end{array} \right]$$

$$R_1 = R_2 - 8R_1$$

$$R_3 = 9R_2 + 8R_3$$

$$= \left[\begin{array}{ccc|c} -8 & 0 & -49 & -57 \\ 0 & 8 & -9 & -1 \\ 0 & 0 & 9 & 1 \end{array} \right]$$

$$R_1 = R_1 + 49R_3$$

$$R_2 = R_2 + 9R_3$$

$$= \left[\begin{array}{ccc|c} -8 & 0 & 0 & -8 \\ 0 & 8 & 0 & 8 \\ 0 & 0 & 1 & 1 \end{array} \right]$$

$$-8x = -8 \Rightarrow x = 1$$

$$8y = 8 \Rightarrow y = 1$$

$$z = 1$$