

SOLVE SIMULTANEOUS LINEAR EQUATION USING CROUT'S METHOD

$$\begin{aligned} 2x + 2y + z &= 1 \\ \text{Solve } x - 2y + 2z &= 2 \text{ Using Crout's Method} \\ 2x - y - 2z &= 4 \end{aligned}$$

SOLUTION

$$AX = B$$

$$\begin{bmatrix} & & \\ & & \\ & & \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 1 \\ 2 \\ 4 \end{bmatrix}$$

$$A = LU$$

$$\begin{bmatrix} & & \\ & & \\ & & \end{bmatrix} = \begin{bmatrix} 0 & 0 \\ & 0 \end{bmatrix} \begin{bmatrix} 0 & \\ 0 & 0 \end{bmatrix}$$

$$= \begin{bmatrix} a & ag & ah \\ b & bg + c & bh + ci \\ d & dg + e & dh + ei + f \end{bmatrix}$$

$a =$	$ag = 2$ $g =$	$ah = 1$ $h =$
$b =$	$bg + c = -2$ $(\quad)(\quad) + c = -2$ $c =$	$bh + ci = 2$ $(\quad)(\quad) + (\quad)i = 2$ $i =$
$d =$	$dg + e = -1$ $(\quad)(\quad) + e = -1$ $e =$	$dh + ei + f = -2$ $(\quad)(\quad) + (\quad)(\quad) + f = -2$ $f = -2$

So the value of $L = \begin{bmatrix} & 0 & 0 \\ & & 0 \end{bmatrix}$ and $U = \begin{bmatrix} 0 & & \\ 0 & 0 & \end{bmatrix}$

LY = B

$$\begin{bmatrix} & 0 & 0 \\ & & 0 \end{bmatrix} \times \begin{bmatrix} y_1 \\ y_2 \\ y_3 \end{bmatrix} = \begin{bmatrix} \\ \\ \end{bmatrix}$$

$$\begin{array}{l} ()y_1 \\ ()y_1 - ()y_2 \\ ()y_1 - ()y_2 - ()y_3 \end{array} = \begin{bmatrix} \\ \\ \end{bmatrix}$$

$y_1 =$ $y_2 =$ $y_3 =$

UX = Y

$$\begin{bmatrix} 0 & & \\ 0 & 0 & \end{bmatrix} \times \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} \\ \\ \end{bmatrix}$$

$$\begin{array}{l} x + y + \frac{1}{2}z \\ y - \frac{1}{2}z \\ z \end{array} = \begin{bmatrix} \\ \\ \end{bmatrix}$$

$z =$ $y =$ $x =$