

$$-x + 2y + z = 0$$

$$6y + 6z = 10$$

$$-2y + 5z = -11$$

$$\begin{bmatrix} -1 & 2 & 1 \\ 0 & 8 & 6 \\ -2 & 0 & 5 \end{bmatrix} \begin{bmatrix} 0 \\ 10 \\ -11 \end{bmatrix}$$

$$A = LU$$

$$\begin{bmatrix} -1 & 2 & 1 \\ 0 & 8 & 6 \\ -2 & 0 & 5 \end{bmatrix} = \begin{bmatrix} 0 & 0 & 0 \\ b & d & 0 \\ c & e & f \end{bmatrix} \times \begin{bmatrix} 1 & y & h \\ 0 & 1 & i \\ 0 & 0 & 1 \end{bmatrix}$$

$$\begin{bmatrix} -1 & 2 & 1 \\ 0 & 8 & 6 \\ -2 & 0 & 5 \end{bmatrix} = \begin{bmatrix} a & ag & ah \\ b & bg + d & bh + di \\ c & cg + e & ch + ei + f \end{bmatrix}$$

$$a = -1$$

$$ag = 2$$

$$ah = 1$$

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$$(-1)g = 2$$

$$(-1)h = 1$$

$$b = 0$$

$$gz = -2$$

$$h = 1$$

$$bg + d = 8$$

$$bh + di = 6$$

$$c = -2$$

$$0(-2) + d = 8$$

$$0(1) + (8)(1) = 6$$

$$d = 8$$

$$i = 0.75$$

$$cg + c = 0$$

$$ch + ci + f = 5$$

$$(-2)(-2) + c = 0$$

$$(-2)(1) + (-4)(0.75) + f = 5$$

$$c = -4$$

$$f = 6$$

$$y_3 = 8.8$$

$$\begin{bmatrix} -1 & 0 & 0 \\ 0 & 1 & 0 \\ -2 & 4 & 1 \end{bmatrix} \begin{bmatrix} y_1 \\ y_2 \\ y_3 \end{bmatrix} = \begin{bmatrix} 0 \\ 10 \\ -11 \end{bmatrix}$$

$$-y_1 = 0$$

$$6y_2 = 10$$

$$y_1 = 0$$

$$y_2 = 1.25$$

$$-2y_1 + 4y_2 = -11$$

$$2(0) + 4(1.25) + 6y_3 = -11$$

$$y_3 = -1$$

$$x = y$$

$$\begin{bmatrix} 1 & -2 & -1 \\ 0 & 1 & 0.75 \\ 0 & 0 & 1 \end{bmatrix} = \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 0 \\ 1.25 \\ -1 \end{bmatrix}$$

$$z = -1$$

$$y + 0.75z = 1.25$$

$$y + 0.75(-1) = 1.25$$

$$y = 2$$

$$x - 2y - z = 0$$

$$x - 2(2) - (-1) = 0$$

$$x = 3$$