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Assignment 1
EE735

question 1

$$3x_1 + x_2 + 2x_3 = 1$$

$$2x_1 + 3x_2 - 2x_3 = 2$$

$$2x_1 + x_2 + x_3 = 3$$

(i) $Ax = B$

$$A = \begin{bmatrix} 3 & 1 & 2 \\ 2 & 3 & -2 \\ 2 & 1 & 1 \end{bmatrix} \quad x = \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} \quad B = \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$$

(ii) $x = A^{-1} * B$

$$A = \begin{bmatrix} 3 & 1 & 2 \\ 2 & 3 & -2 \\ 2 & 1 & 1 \end{bmatrix}$$

$$A^{-1} = \frac{Adj(A)}{det(A)}$$

$$det(A) = 3(3+2) - 1(2+4) + 2(2-6)$$

$$= 15 - 6 - 8$$

$= 1$

$$A^{-1} = \begin{bmatrix} 5 & 1 & -8 \\ -6 & -1 & 10 \\ -4 & -1 & 7 \end{bmatrix}$$

$$X = \begin{bmatrix} 5 & 1 & -8 \\ -6 & -1 & 10 \\ -4 & -1 & 7 \end{bmatrix} \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix} = \begin{bmatrix} -17 \\ 22 \\ 15 \end{bmatrix}$$

$x_1 = -17$, $x_2 = 22$, $x_3 = 15$