HW2

Freeman Chen

July 14, 2022

Question 1

a. A * B = $\begin{bmatrix} 5 & 5 & 5 \\ 17 & 17 & 17 \\ 12 & 12 & 12 \end{bmatrix}$ (Matrix multiplication)

b. A * x = $\begin{bmatrix} 32 \\ 79 \\ 85 \end{bmatrix}$ (Matrix multiplication)

c. x'* B = $\begin{bmatrix} 17 & 17 & 17 \end{bmatrix}$ (x transpose and Matrix multiplication)

d. B * y = error (B is a 3 by 3 matrix and y is a 1 by 3 matrix, we need the numbers of column of B match numbers of rows of y in order to run this function)

e. x * A = error (x is a 3 by 1 matrix and A is a 3 by 3 matrix, we need the numbers of column of x match numbers of rows of A in order to run this function)

f. x * y = $\begin{bmatrix} 15 & 50 & 45 \\ 30 & 60 & 90 \\ 40 & 80 & 120 \end{bmatrix}$ (Matrix multiplication)

g. y * x = 195 (Matrix multiplication)

h. x * y' = error (x is a 3 by 1 matrix and y transpose is also a 3 by 1, so it not gonna work)

I. x .*y = $\begin{bmatrix} 15 & 50 & 45 \\ 30 & 60 & 90 \\ 40 & 80 & 120 \end{bmatrix}$ (element multiplication)

J. A . *B = $\begin{bmatrix} 2 & -1 & 4 \\ 9 & 6 & 2 \\ 1 & 3 & 8 \end{bmatrix}$ (element multiplication)

Question 2

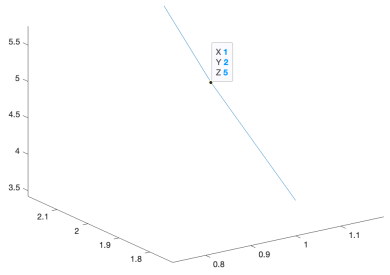
solution: x = $\begin{bmatrix} 20 \\ -32 \\ 13 \end{bmatrix}$

Rank of A = 3

I used 3 Method to solve the x, first, I used the linsolve function from matlab, second I use A, third I create an augmented matrix matrix and did the row reduced echelon form to find the solution

Question 3

I created a augmented matrix matrix and did the row reduced echelon form, and I get $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$ which means there's no solution, the first two rows gave me $x_1 = 0, x_2 = 0$ but the third row gave me $x_1 + x_2 = 1$ which is contradiction. therefor, there's no solution for this linear system, we can also see from the graph

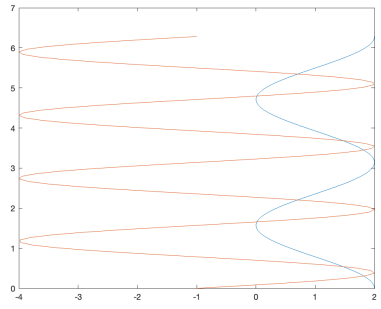


3

Question 4

see github file @HW2$_4$

Question 5



3