ASSIGNMENT 2

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Download all python codes from

https://github.com/ArunSiddardha/EE3900/blob/main/Assignment_2/code/Assignment_2.py

and latex-tikz codes from

https://github.com/ArunSiddardha/EE3900/blob/main/Assignment_2/Assignment_2.tex

1 Matrices 2.46

Let $\mathbf{A} = \begin{pmatrix} 1 & -2 & 3 \\ -4 & 2 & 5 \end{pmatrix}, \mathbf{B} = \begin{pmatrix} 2 & 3 \\ 4 & 5 \\ 2 & 1 \end{pmatrix}$. Find **AB** and **BA**. Show that **AB** $\neq$ **BA**

2 Solution

$$\mathbf{AB} = \begin{pmatrix} 1 & -2 & 3 \\ -4 & 2 & 5 \end{pmatrix} \begin{pmatrix} 2 & 3 \\ 4 & 5 \\ 2 & 1 \end{pmatrix} \tag{2.0.1}$$

$$= \begin{pmatrix} (1\times 2) + (-2\times 4) + (3\times 2) & (1\times 3) + (-2\times 5) + (3\times 1) \\ (-4\times 2) + (2\times 4) + (5\times 2) & (-4\times 3) + (2\times 5) + (5\times 1) \end{pmatrix} \tag{2.0.2}$$

$$= \begin{pmatrix} 0 & -4 \\ 10 & 3 \end{pmatrix} \tag{2.0.3}$$

$$\mathbf{BA} = \begin{pmatrix} 2 & 3 \\ 4 & 5 \\ 2 & 1 \end{pmatrix} \begin{pmatrix} 1 & -2 & 3 \\ -4 & 2 & 5 \end{pmatrix} \tag{2.0.4}$$

$$= \begin{pmatrix} (2\times 1) + (3\times(-4)) & (2\times -2) + (3\times 2) & (2\times 3) + (5\times 3) \\ (4\times 1) + (5\times(-4)) & (4\times -2) + (5\times 2) & (4\times 3) + (5\times 5) \\ (2\times 1) + (1\times(-4)) & (2\times -2) + (1\times 2) & (2\times 3) + (1\times 5) \end{pmatrix} \tag{2.0.5}$$

$$= \begin{pmatrix} -10 & 2 & 21 \\ -16 & 2 & 37 \\ -2 & -2 & 11 \end{pmatrix} \tag{2.0.6}$$

here we can clearly see that **AB** $\neq$ **BA** .
Hence showed