Assignment 2

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Download the python codes from:

https://github.com/tanayyadav28/EE3900–Assignments/blob/main/Assignment_2/code/Assignment_2.py

Download the latex-tikz codes from:

https://github.com/tanayyadav28/EE3900–Assignments/blob/main/Assignment_2/Assignment_2.tex

1 Problem

[Matrices Q2; Q47]

If $\mathbf{A} = \begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$ and $\mathbf{B} = \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$, then find **AB**, **BA**.
Show that $\mathbf{AB} \neq \mathbf{BA}$.

2 Solution

Performing respective matrix multiplications,

$$\mathbf{AB} = \begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix} \times \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix} \tag{2.0.1}$$

$$\mathbf{AB} = \begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix} \tag{2.0.2}$$

Similarly,

$$\mathbf{BA} = \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix} \times \begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix} \tag{2.0.3}$$

$$\mathbf{BA} = \begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix} \tag{2.0.4}$$

$$\tag{2.0.5}$$

$$\therefore \mathbf{AB} \neq \mathbf{BA} \tag{2.0.6}$$