

Identity matrix

- square matrix ($n \times n$)
- 1 on diagonals ($UL \rightarrow LR$)
- 0 elsewhere

3x3 I

$$\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

Inverse

A square matrix could have an inverse if $AB = BA = I_n$

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

2x2

$$B = \begin{bmatrix} 2 & 4 \\ 3 & 7 \end{bmatrix}$$

2x2

Try AB
BA

$$\begin{matrix} 2 \times 2 \\ 2 \times 2 \end{matrix}$$

$$AB = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

I_2

- $3 - 2 = 1$
- $6 - 6 = 0$
- $-1 + 1 = 0$

then A has an inverse

$$A B \rightarrow A^{-1}$$

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