

# Matrix Multiplication part -2

if we want  $C \times D$

$N \times A * A \times M$

1st matrix's Column and

2nd matrix's Row has to

be equal



$$\begin{bmatrix} 3 & 1 & 2 \\ -2 & 0 & 5 \end{bmatrix} \times \begin{bmatrix} -1 & 3 \\ 0 & 5 \\ 2 & 5 \end{bmatrix}$$

A  
 $2 \times 3$

B  
 $2 \times 3$

$$= \begin{bmatrix} 3 \cdot -1 + 1 \cdot 0 + 2 \cdot 2 & 3 \cdot 3 + 1 \cdot 5 + 2 \cdot 2 \\ -2 \cdot -1 + 0 \cdot 0 + 5 \cdot 2 & -2 \cdot 3 + 0 \cdot 5 + 5 \cdot 5 \end{bmatrix} = \begin{bmatrix} 1 & 24 \\ 12 & 19 \end{bmatrix}$$

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A  
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$$A \cdot B = \begin{bmatrix} 1 & 24 \\ 12 & 19 \end{bmatrix}$$

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$$\begin{bmatrix} -1 & 3 \\ 0 & 5 \\ 2 & 5 \end{bmatrix} \times \begin{bmatrix} 3 & 1 & 2 \\ -2 & 0 & 5 \end{bmatrix}$$

B  
 $3 \times 2$

A  
 $2 \times 3$

$$= \begin{bmatrix} -1 \cdot 3 + 3 \cdot -2 & -1 \cdot 1 + 3 \cdot 0 & -1 \cdot 2 + 3 \cdot 5 \\ 0 \cdot 3 + 5 \cdot -2 & 0 \cdot 1 + 0 \cdot 5 & 0 \cdot 2 + 5 \cdot 5 \\ 2 \cdot 3 + 5 \cdot -2 & 2 \cdot 1 + 5 \cdot 0 & 2 \cdot 2 + 5 \cdot 5 \end{bmatrix} = \begin{bmatrix} -9 & -1 & 13 \\ -10 & 0 & 25 \\ -4 & 2 & 29 \end{bmatrix}$$

# Matrix Multiplication part - 2



if we want  $C \times D$   
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1st matrix's Column and  
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$$B \cdot A = \begin{bmatrix} -9 & -1 & 13 \\ -10 & 0 & 25 \\ -4 & 2 & 29 \end{bmatrix}$$

$3 \times 3$

$$A \cdot B = \begin{bmatrix} 1 & 24 \\ 12 & 19 \end{bmatrix}$$



# Matrix Multiplication part -2

if we want  $C \times D$

$$N \times A * A \times M$$

1st matrix's **Column** and

2nd matrix's **Row** has to  
be equal.

$$\begin{bmatrix} 2 & 1 \end{bmatrix} \times \begin{bmatrix} 1 & 4 \\ 2 & 5 \\ 3 & 6 \end{bmatrix}$$

A  
 $1 \times 2$

B  
 $3 \times 2$

Multiplication is not  
possible





# LET'S LEARN 2GETHER



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