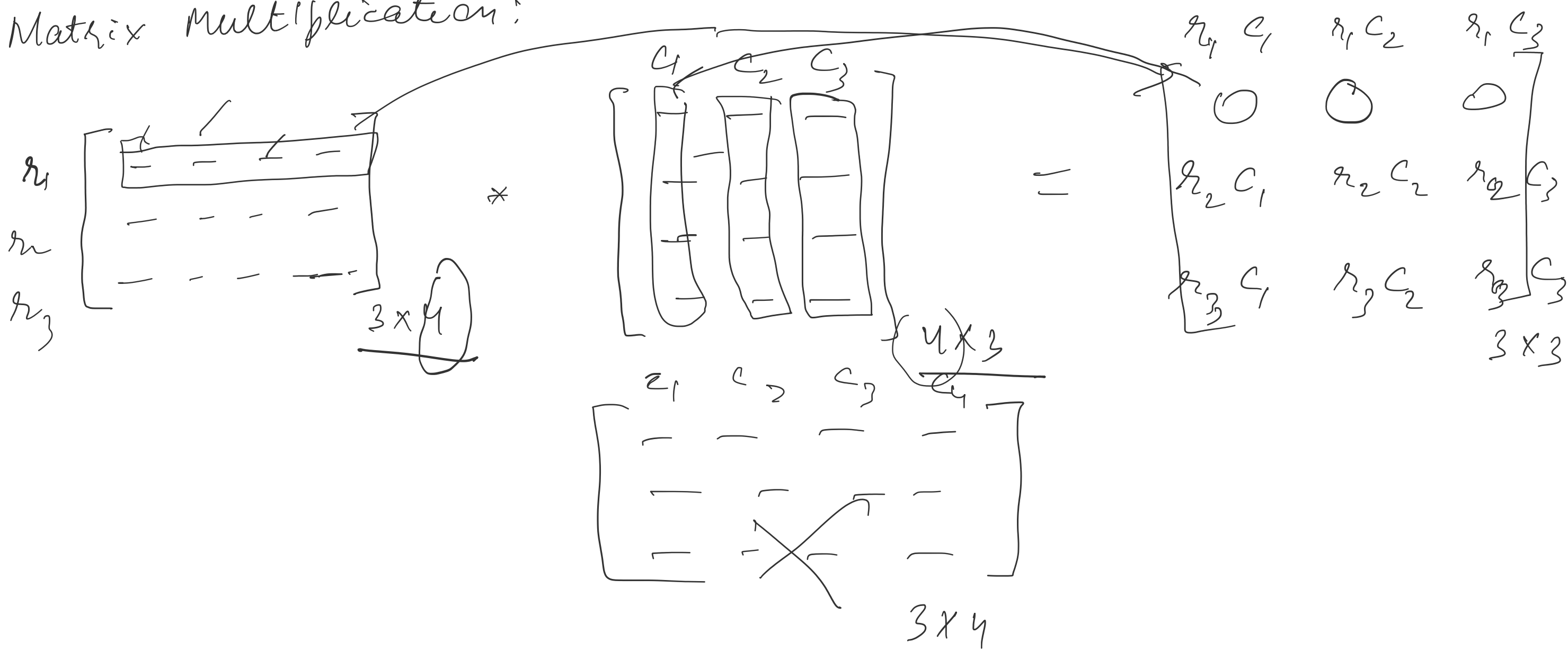


Matrix multiplication:



$$(a \times b) \times (c \times d)$$

It is possible only when  $b = c$

$$A = \begin{bmatrix} \phantom{0} \\ \phantom{0} \\ \phantom{0} \\ \phantom{0} \\ \phantom{0} \end{bmatrix}_{5 \times 2} = \begin{bmatrix} \phantom{0} \\ \phantom{0} \\ \phantom{0} \\ \phantom{0} \\ \phantom{0} \end{bmatrix}_{(2) \times 1} \Rightarrow 5 \times 1$$

$$\begin{bmatrix} 0 & 0 & 0 \\ 10 & 10 & 10 \\ 20 & 20 & 20 \\ 30 & 30 & 30 \end{bmatrix}_{4 \times 3} + \begin{bmatrix} 0 & \dots \\ 1 & \dots \\ 2 & \dots \\ 3 & \dots \end{bmatrix}_{4 \times 3} \Rightarrow \begin{bmatrix} 0 & \dots & \dots \\ 11 & \dots & \dots \\ 22 & \dots & \dots \\ 33 & \dots & \dots \end{bmatrix}$$

$$\begin{bmatrix} \phantom{0} \\ \phantom{0} \\ \phantom{0} \\ \phantom{0} \end{bmatrix}_{4 \times 3} + \begin{bmatrix} \phantom{0} \\ \phantom{0} \\ \phantom{0} \\ \phantom{0} \end{bmatrix}_{1 \times 3} = \begin{bmatrix} \phantom{0} \\ \phantom{0} \\ \phantom{0} \\ \phantom{0} \end{bmatrix}_{4 \times 3}$$

$$\begin{bmatrix} \phantom{0} \\ \phantom{0} \\ \phantom{0} \\ \phantom{0} \end{bmatrix}_{4 \times 1} + \begin{bmatrix} \phantom{0} \\ \phantom{0} \\ \phantom{0} \\ \phantom{0} \end{bmatrix}_{4 \times 1} + \begin{bmatrix} \phantom{0} \\ \phantom{0} \\ \phantom{0} \\ \phantom{0} \end{bmatrix}_{4 \times 1} = \begin{bmatrix} \phantom{0} \\ \phantom{0} \\ \phantom{0} \\ \phantom{0} \end{bmatrix}_{4 \times 3}$$

$$\begin{bmatrix} \phantom{0} \\ \phantom{0} \\ \phantom{0} \\ \phantom{0} \end{bmatrix}_{4 \times 1} + \begin{bmatrix} \phantom{0} \\ \phantom{0} \\ \phantom{0} \\ \phantom{0} \end{bmatrix}_{4 \times 1} + \begin{bmatrix} \phantom{0} \\ \phantom{0} \\ \phantom{0} \\ \phantom{0} \end{bmatrix}_{4 \times 1} + \begin{bmatrix} \phantom{0} \\ \phantom{0} \\ \phantom{0} \\ \phantom{0} \end{bmatrix}_{4 \times 1} + \begin{bmatrix} \phantom{0} \\ \phantom{0} \\ \phantom{0} \\ \phantom{0} \end{bmatrix}_{4 \times 1} + \begin{bmatrix} \phantom{0} \\ \phantom{0} \\ \phantom{0} \\ \phantom{0} \end{bmatrix}_{4 \times 1} = \begin{bmatrix} \phantom{0} \\ \phantom{0} \\ \phantom{0} \\ \phantom{0} \end{bmatrix}_{4 \times 6}$$

Error Case.

$$\begin{bmatrix} \phantom{0} \\ \phantom{0} \end{bmatrix}_{2 \times 2} + \begin{bmatrix} \phantom{0} \\ \phantom{0} \end{bmatrix}_{1 \times 3} \Rightarrow \text{Error.}$$

→ Replication is not possible.

Images:

$$[564 \times 564 \times 3] \Rightarrow$$

Yellow → R G B  
↓ ↓ ↓

$$\begin{bmatrix} \phantom{0} \\ \phantom{0} \\ \phantom{0} \end{bmatrix}$$

