

Order of a Matrix

JEE Class 12 Mathematics - Chapter 3

The Main Rule

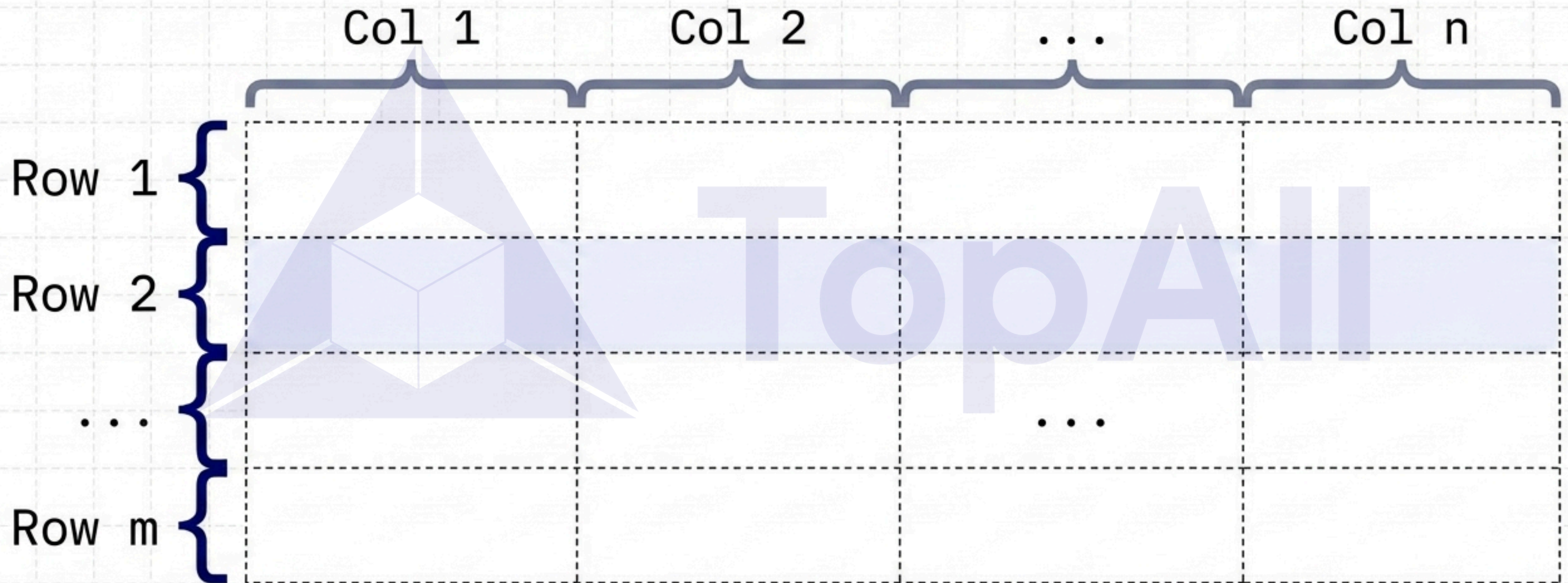
Order = $m \times n$

m = Rows
(Count Horizontally)

n = Columns
(Count Vertically)

Always remember: **R x C** (Row x Column)

The Visual Grid



A matrix of order $m \times n$ is a structured grid mapping height (m rows) to width (n columns).



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$$E=mc^2$$



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Entry Notation (The Address System)

$$A = [a_{ij}]_{(m \times n)}$$



i = **Row Index**
(The Street)



j = **Column Index**
(The House Number)

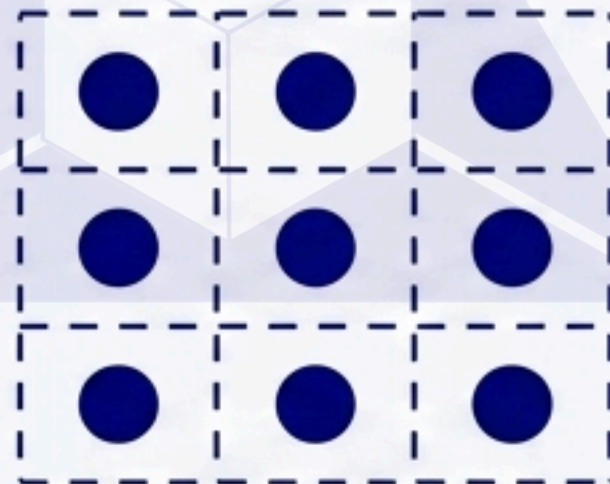
a_{23}

Example: a_{23} means the exact element located at Row 2, Column 3.

Total Capacity

$$\text{Number of Elements} = m \times n$$

The Visual



Order: 3 x 2

The Math

Calculation:

$$3 \times 2 = 6 \text{ elements}$$

The total number of entries is simply the product of the rows and columns.

Reverse Engineering (Example)

Problem: If a matrix has 8 elements, what are its possible orders?

Explanation: Finding possible orders means finding all factor pairs of the total elements.

Shape Catalog



1 x 8



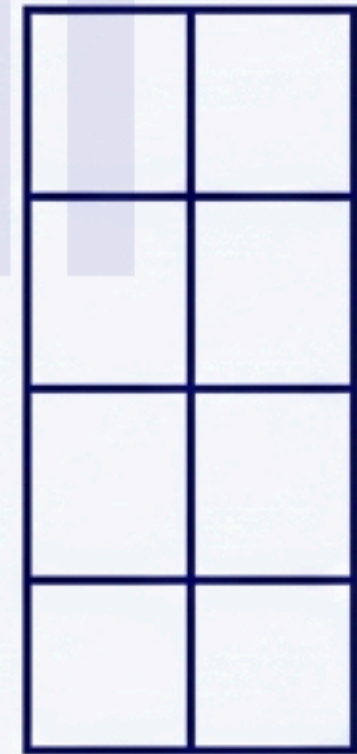
2 x 4



8 x 1



2 x 4



4 x 2

Key Takeaways



Always count Rows first, Columns second ($R \times C$).



a_{ij} means the specific entry at Row i , Column j .



****TRAP!**** Don't mix up i and j ! The element a_{12} (Row 1, Col 2) is **NOT** the same as a_{21} (Row 2, Col 1).



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