

1. What are Tensors

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2. 0D Tensor/Scalar

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(2) (3)
✓
Scalars → 0D Tensor 0

3. 1D Tensor/Vector

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$[1, 2, 3, 4]$ → 1D Tensor

↳ Vector
↳ 1D array / array

↳ 1D Tensor / Vector

↳ 4D

nDim → 1

Axis
2 Dim

No. of axes = rank = dim

$[1, 2]$ → vector (2)
↳ 1D Tensor

$[0, 1, 2, 3]$

↳ scalars → vector

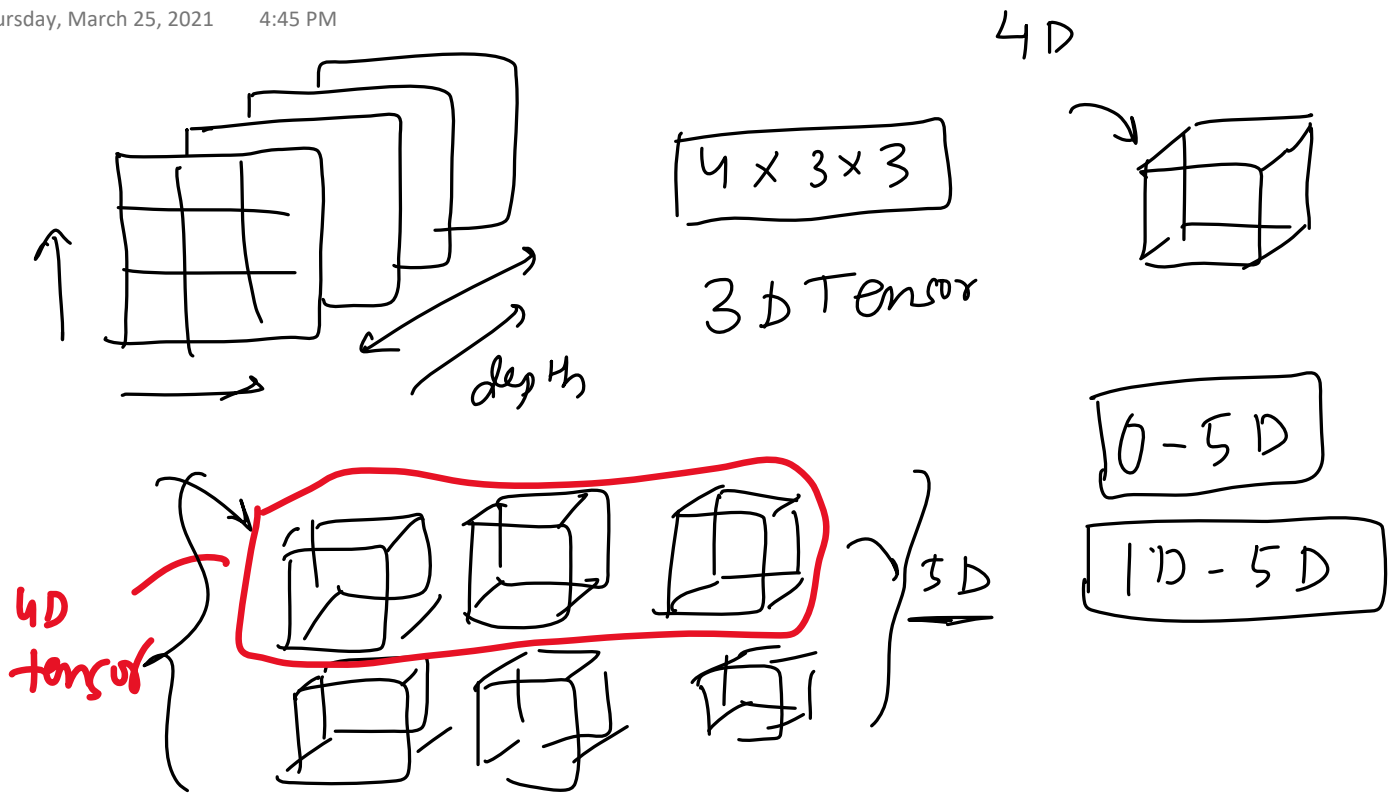
4. 2D Tensor/Matrices

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$$\begin{array}{c} [1, 2, 3] \quad [4, 5, 6] \quad [7, 8, 9] \\ \xrightarrow{\hspace{1cm}} \\ \downarrow \left[\begin{array}{c} [1, 2, 3] \\ [4, 5, 6] \\ [7, 8, 9] \end{array} \right] \rightarrow 2D \end{array} \quad \text{Rank} = 2 = \text{ndim}$$

5. ND Tensors

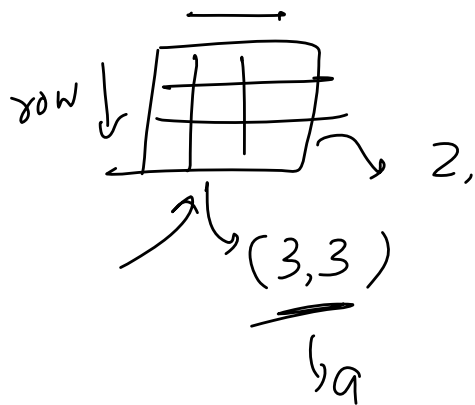
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6. Rank, Axes and Shape

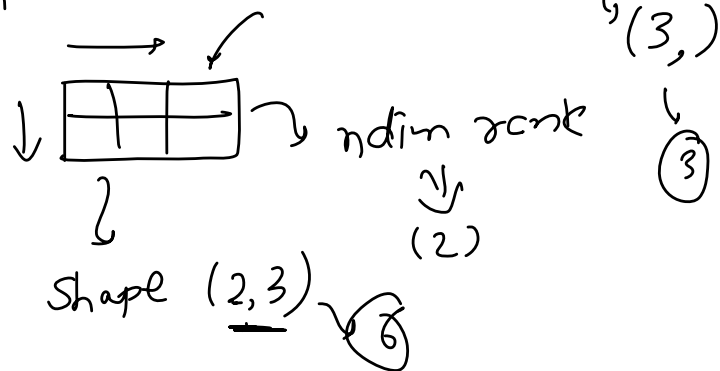
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No. of axis = Rank = No. of dim



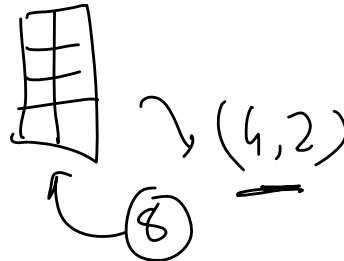
Size = 1

Shape



Shape $(2,3)$

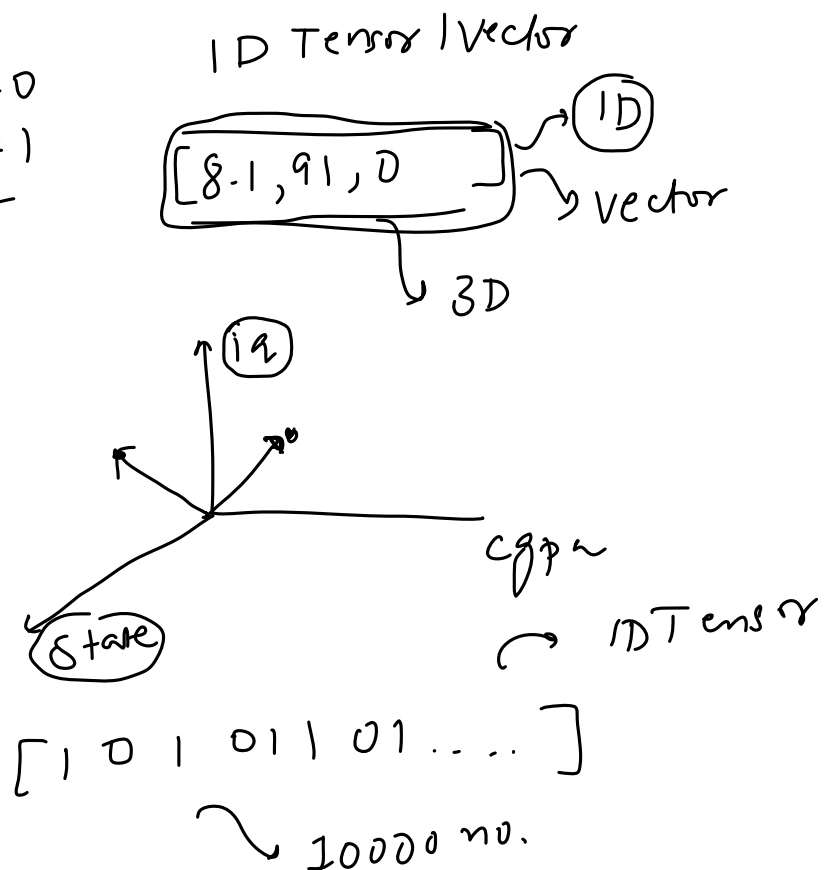
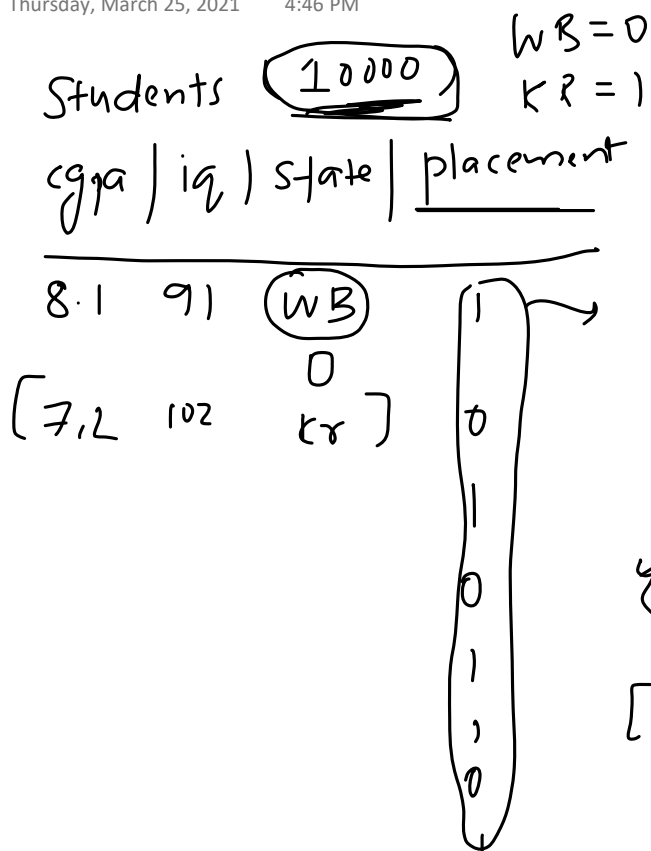
Size of tensor



7. Example of 1D Tensors

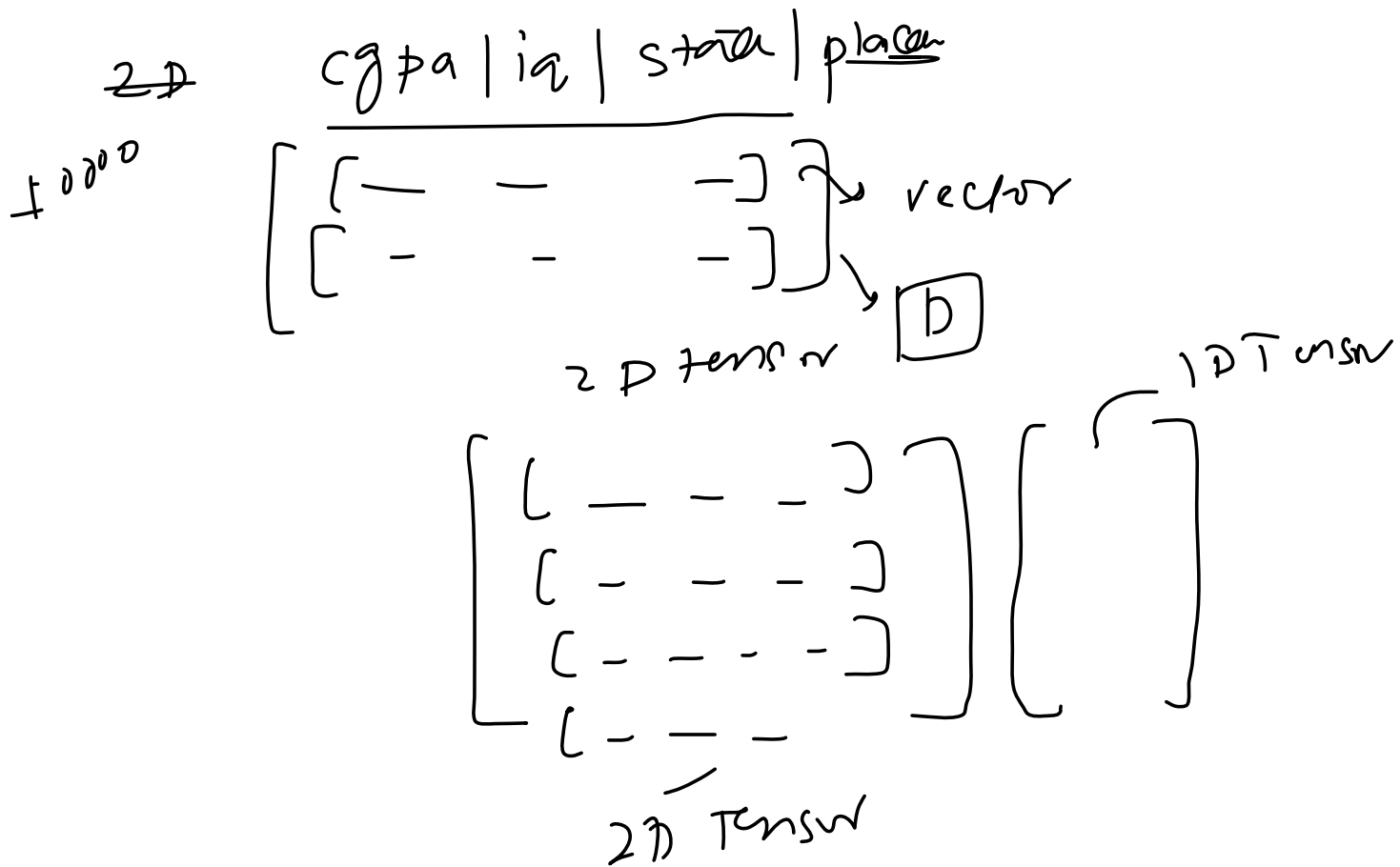
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8. Example of 2D Tensors

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9. Example of 3D Tensors

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NLP

Hi Nitish

Hi Rahul

Hi Ankit

Hi	Nitish	Rahul	Ankit
1	0	0	0
0	1	0	0
0	0	1	0
0	0	0	1

$\left[\left[[1, 0, 0, 0], [0, 1, 0, 0] \right] \right]$

(2)

$(3, 2, 4)$

$\left[[1, 0, 0, 0], [0, 0, 1, 0] \right]$ 3D Tensor

$\left[[1, 0, 0, 0], [0, 0, 0, 1] \right]$

Timeseries Data

(2)

Highest | Lowest

10 years
 $(365, 2)$

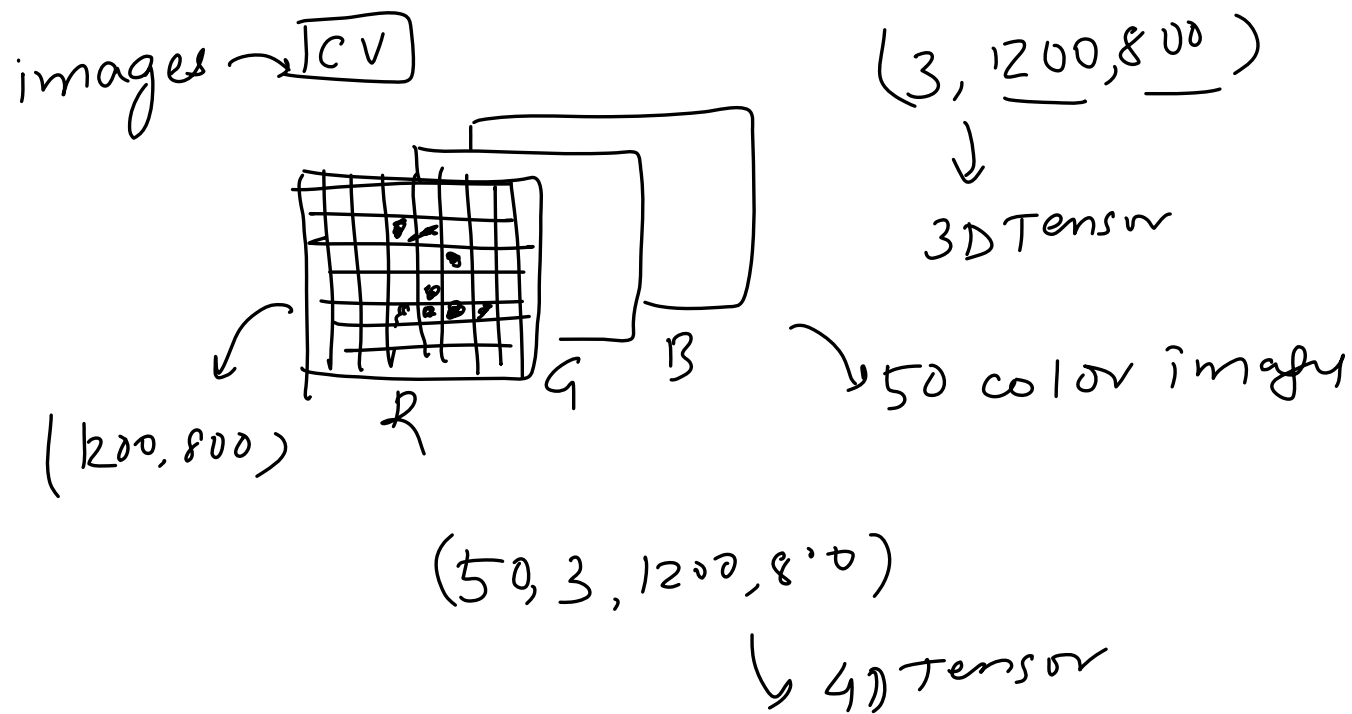
Day 1 — —
Day 2 — —
Day 365 — —
365

2D → 10
 $(10, 365, 2)$ time axis
3D Tensor

10. Example of 4D Tensors

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12. Example of 5D Tensors

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