5 Vectors Multiplication: Scalar multiplication

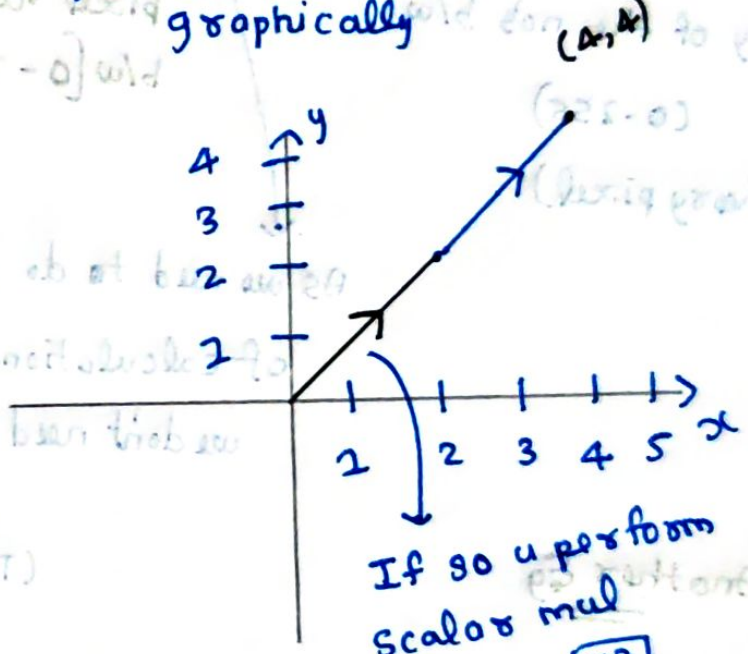
↓

This involves multiplying the vector by a scalar → resulting in a vector where each component is scaled by a vector

$$A = \begin{bmatrix} 3 \\ 5 \\ 7 \end{bmatrix} \quad c = 4$$

→ Representing this graphically

$$cA = \begin{bmatrix} 12 \\ 20 \\ 28 \end{bmatrix}$$



we use Scalar multiplication (in order to scale some values to a different scale)

If so u perform scalar mul (then you ×2 with both the values)

Eg → Normalization and Standardization

↓

R, G, B

Scaling → units data

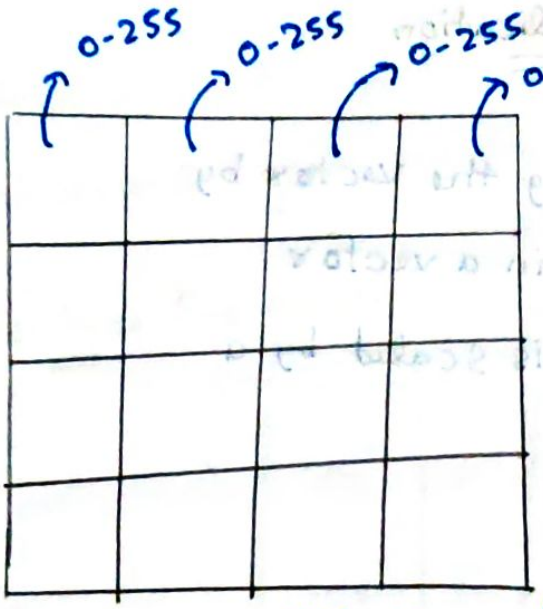
$$A = \begin{bmatrix} 2 \\ 2 \end{bmatrix} \quad c = 2$$

then this gets multiplied → $\begin{bmatrix} 4 \\ 4 \end{bmatrix}$ new values

Suppose say I have an image (which is represented in rows and columns)

→

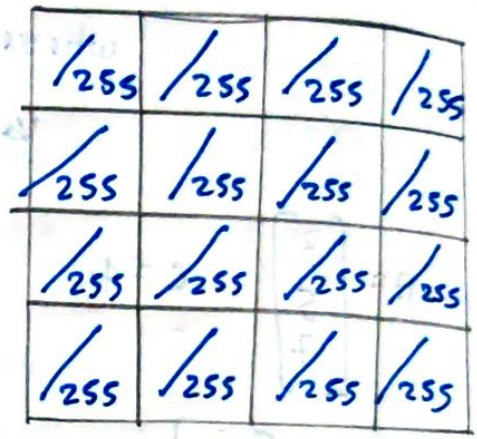
TTO



assume → grayscale image (only 1 channel)

All the images will have any of the no's b/w (0-255) (Every pixel)

Image Processing (Normalise pixel values b/w [0-1])



As we need to do a lot of calculation here we don't need any big no's

Another Eg

Machine

Height → [160, 170, 180]

Scale (to metres) =

c = 0.01

Scaling factor

(This will be helpful when we do specific calc and that calc requires dependency of other units)

Why 0.01 ↳ cause

1cm = 0.01m

ch = 0.01 →

0.01 [160, 170, 180]

⇒ [1.6, 1.7, 1.8]

with the help of Scalar mul

↳ we can scale the values to diff scale