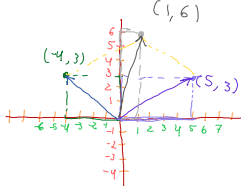


## ADDITION OF VECTORS

The addition of two vectors.

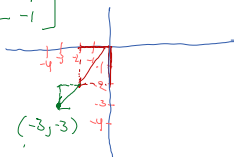
$$p_1 = \begin{bmatrix} -4 \\ 3 \end{bmatrix} \quad p_2 = \begin{bmatrix} 5 \\ 3 \end{bmatrix}$$

$$p_1 + p_2 = \begin{bmatrix} -4 \\ 3 \end{bmatrix} + \begin{bmatrix} 5 \\ 3 \end{bmatrix} = \begin{bmatrix} 1 \\ 6 \end{bmatrix}$$



$$A = \begin{bmatrix} x_1 \\ y_1 \\ z_1 \end{bmatrix} \quad B = \begin{bmatrix} x_2 \\ y_2 \\ z_2 \end{bmatrix} \quad A + B = \begin{bmatrix} x_1 + x_2 \\ y_1 + y_2 \\ z_1 + z_2 \end{bmatrix} = \begin{bmatrix} x_3 \\ y_3 \\ z_3 \end{bmatrix}$$

$$A = \begin{bmatrix} -2 \\ -2 \end{bmatrix} \quad B = \begin{bmatrix} -1 \\ -1 \end{bmatrix}$$



### EXAMPLE Solving a use case

Sensor 1

Sensor 2

EDA and Feature Engineering

The final sensor is the sum of the two sensors

$$\begin{bmatrix} 3 \\ 5 \\ 7 \end{bmatrix} \quad \begin{bmatrix} 2 \\ 4 \\ 6 \end{bmatrix}$$

$$\text{Sensor 1} + \text{Sensor 2} =$$

$$\begin{bmatrix} 3 \\ 5 \\ 7 \end{bmatrix} + \begin{bmatrix} 2 \\ 4 \\ 6 \end{bmatrix} = \begin{bmatrix} 5 \\ 9 \\ 13 \end{bmatrix}$$

- 1) Data Aggregation Task
- 2) Feature Engineering

### NPL -> Natural Language Processing

#### Ecommerce Website

##### Reviews

##### Sentiment

The product is good  
The product is bad

1  
0

$$I/P \rightarrow \boxed{\text{Model}} \rightarrow \text{Sentiment}$$

Text  $\rightarrow$  Vector  $\rightarrow$  One hot Encoding

$\downarrow$   
[ - - - - ]  
Numerical Values  $\rightarrow$  Word2Vector

$\rightarrow$  TFIDF  
 $\rightarrow$  Bow

### 2) Word Embeddings

1) DATA : [0.2, 0.1, 0.4]

2) Science : [0.3, 0.7, 0.2]

DATA Science = Vdata + Vscience

DATAScience = [0.2 + 0.3, 0.1 + 0.7, 0.4 + 0.2]

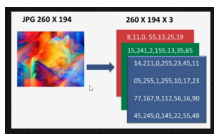
DATAScience = [0.5, 0.8, 0.6]

3) Color Image  $\rightarrow$  PIXEL [R, G, B] = [255, 128, 0]

RED CHANNEL  $\Rightarrow$  R = [255]

GREEN CHANNEL  $\Rightarrow$  G = [128]

BLUE CHANNEL  $\Rightarrow$  B = [0]



WHITE/BLACK GRAY SCALE PIXEL =  $1/3 * [255 + 128 + 0] = 1/3 * [383] = 297$