2.numpy_pandas

Monday, June 8, 2020 9:02 AM

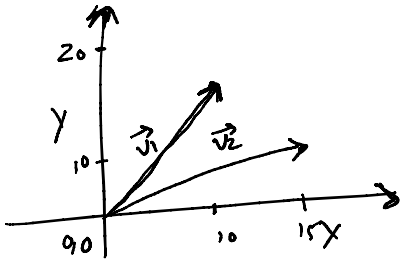
1. Scalar → single observation with magnitude only

5 10 15

2. Vectors → collection of scalar with magnitude

$V_1 = [10, 20]$

$V_2 = [15, 10]$



row_vector = [1, 2, 3]

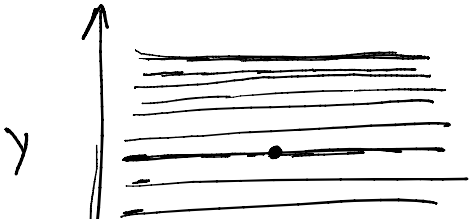
Colum vector = $\begin{bmatrix} 4 \\ 5 \\ 6 \end{bmatrix}$

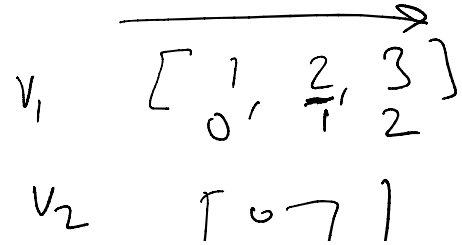
→ lines can be made through vectors

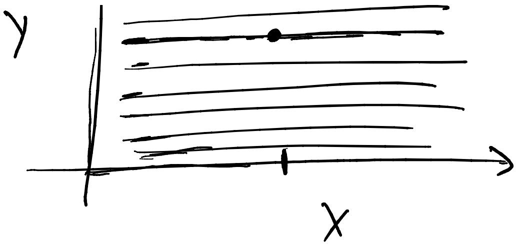
③ Matrix / Array → collection vectors / plain

features ↓

m = records → $\begin{bmatrix} 1, & 2, & 3 \\ 4, & 5, & 6 \\ 7, & 8, & 9 \end{bmatrix}$







$V_2 \quad \begin{bmatrix} 0 \\ 1 \\ 2 \end{bmatrix} \downarrow$

$m[y_1, x_1] = 2.$

$v_1 = [10 \; 30 \; 60]$

feature or attribute

(0,0)		Maths (0)	Science (1)	English (2) → y
S_1	0	10	50	20
S_2	1	30	60	40
S_3	x 2	50	10	90

row-vector ⇒ Record / tuple

matrix
⇓
vector
⇓
scalar

$v_1[1]$

→ $m[x, y]$, m[row, col]

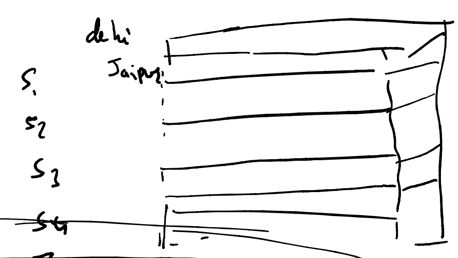
→ $m[1, 2] \Rightarrow 40$

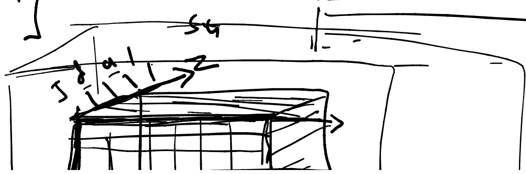
(4) Tensors → multi-dimensional Arrays

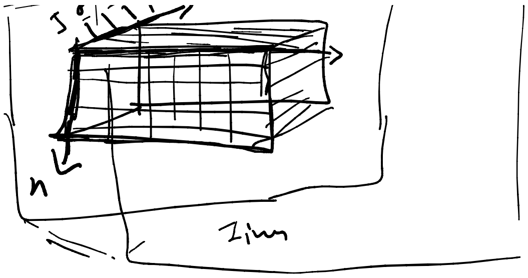
Jaipur

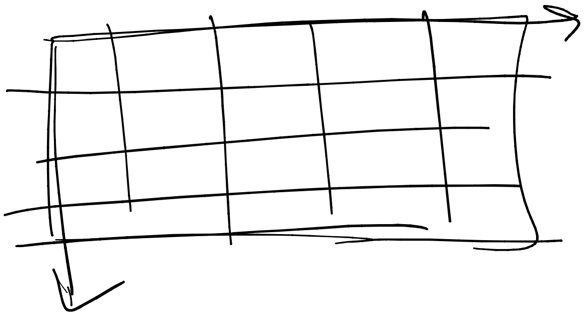
Collection of matrix

	name	mail	course
S_1	[x	p,	a]
S_2	[y	q,	b]
S_3	[2,	r,	c]







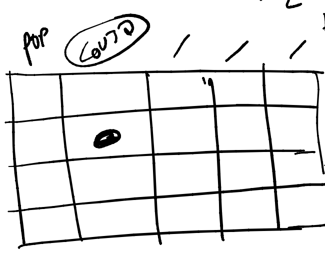


state

y ↓

x → Country

0	India	0 punjab	
1	US	1 Rajasthan →	0 Tonk, 1 Jaipur, Udai.
2	China	2 Delhi	
3	Aus	3 Gujarat	



x , y z

T [0 , 1 , 1 , (1)]

Tensor
Array
Matrix
Scalar

ndim → dimensions
shape → 206 × 30 × 100

#0 #1 #2

array = [[a_{00} , a_{01} , a_{02}] #0

[a_{10} , a_{11} , a_{12}] #1

[a_{20} , a_{21} , a_{22}] #2

[a_{30} , a_{31} , a_{32}] #3

]

→ Dimension → 1D, 2D, 3D, ... nD

→ Shape → m×n

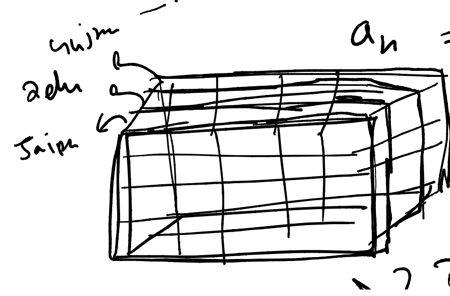
→ size → no of elements

→ dtype → memory consu , Range

a_{xy} = scalar

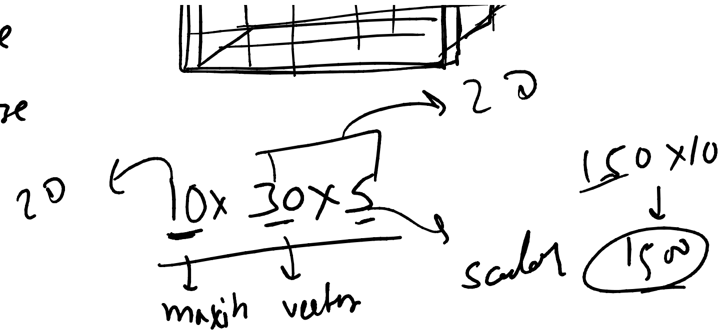
a_x = vector

10

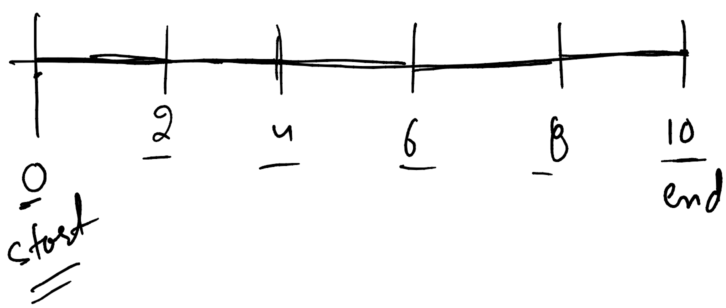


→ dtype → memory cons, Range

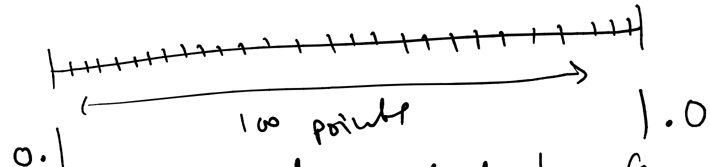
→ itemsize → each element size



→ Linspace (s, e, n) → equal distance points b/w start to end

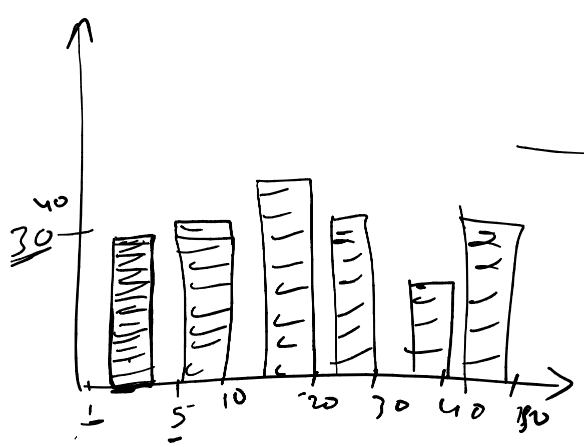


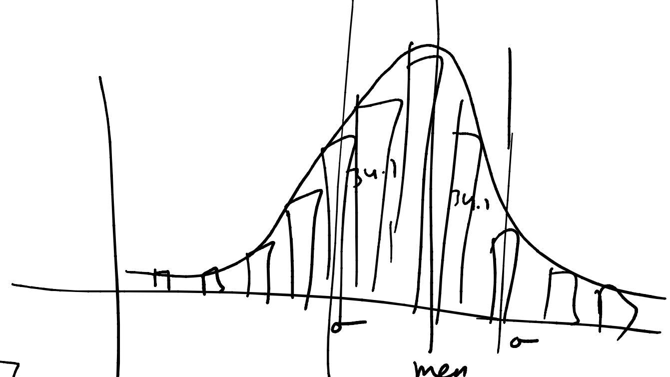
a = np.linspace(0.1, 1.0, 100).reshape(10, 10)



at equal distance from each other

→





data = {

}

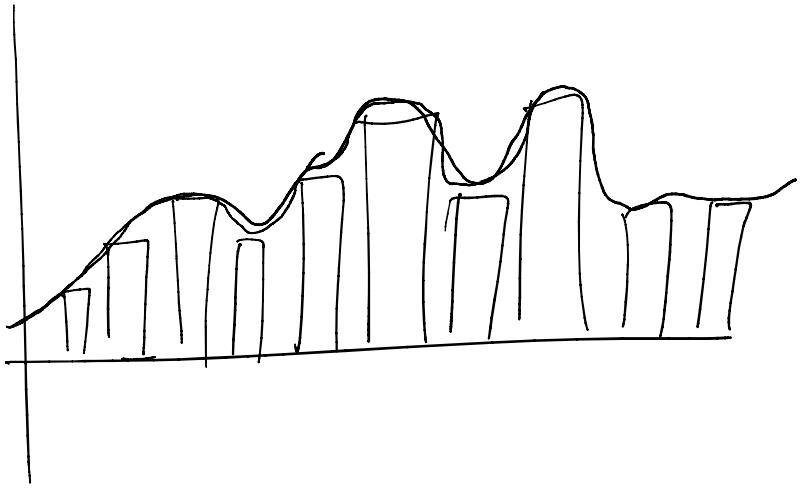
distribution

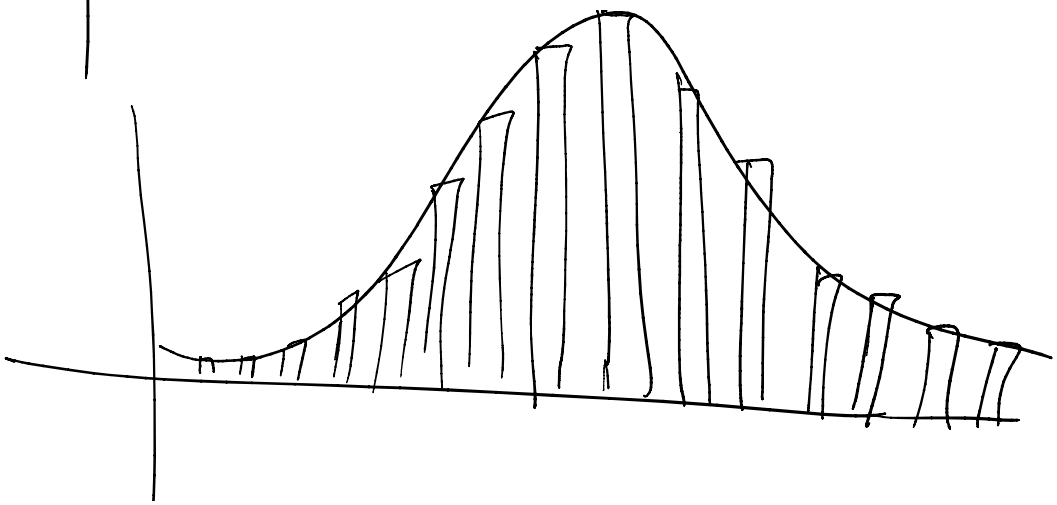
Histogram → data distribution

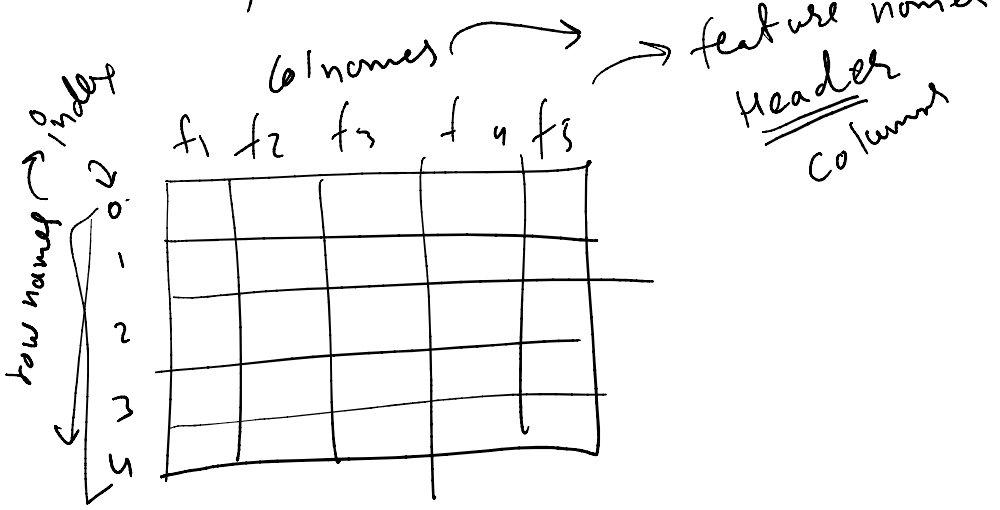
bin → (1-5)

Bins → freq

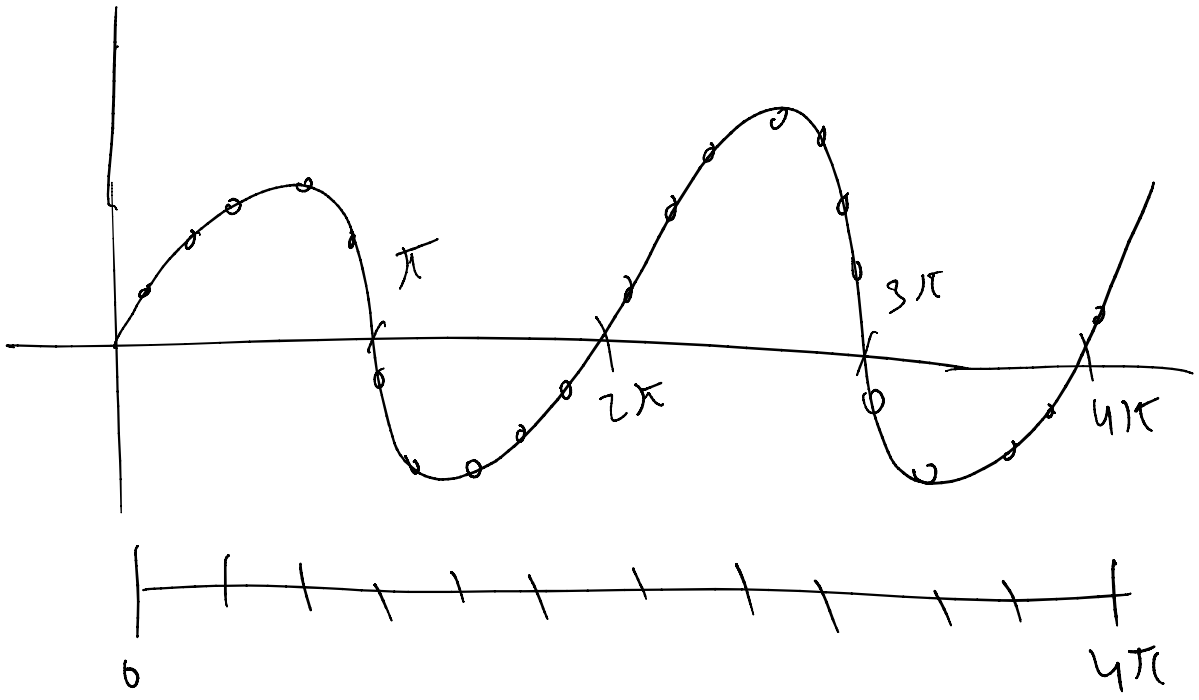
f(n) → pdf







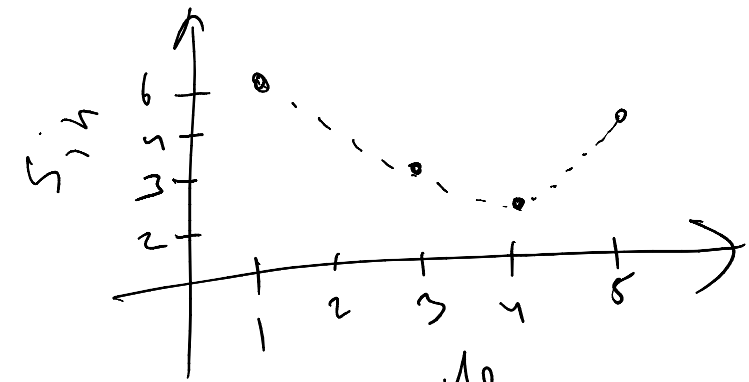
CSV

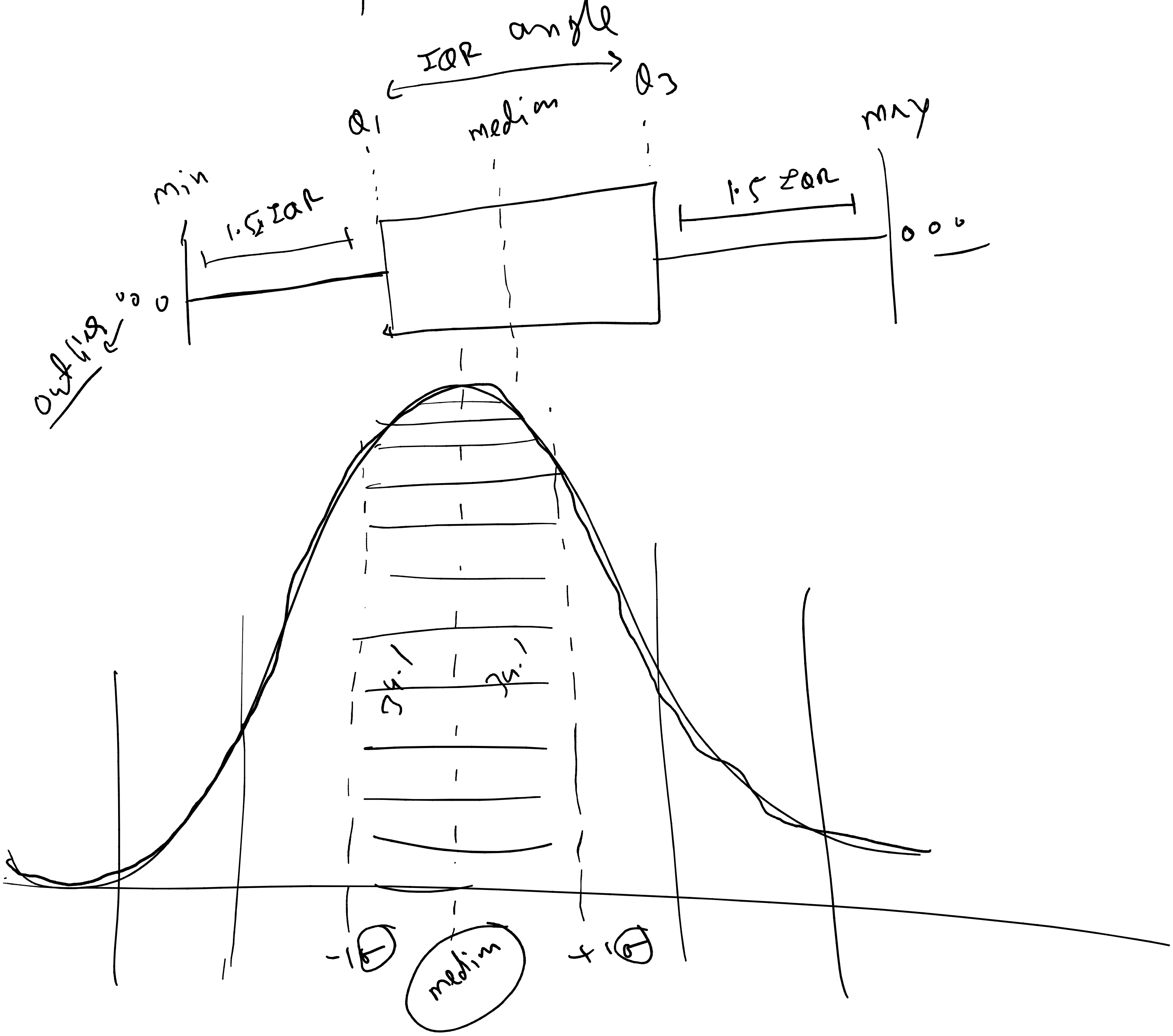


x = [1, 3, 4, 5]

y = [6, 3, 7, 4]

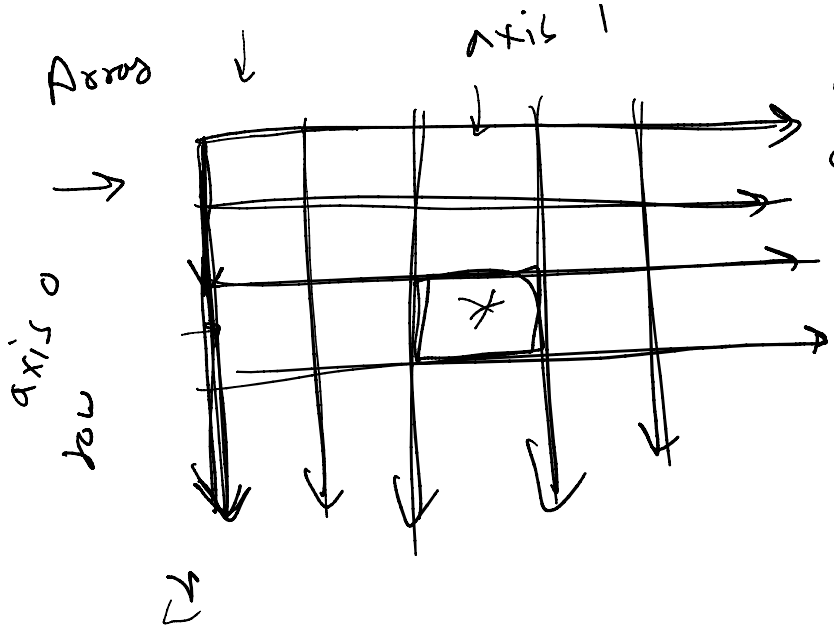
y = L ...





Arrays ↓ axis 1

col




```
array([[43, 38, 18, 45, 29],
       [16, 28, 48, 35, 42],
       [48, 30, 23, 42, 25],
       [11, 14, 48, 49, 17],
       [43, 48, 34, 48, 31],
       [47, 22, 36, 37, 27]])
```

$$A = \begin{bmatrix} \quad \end{bmatrix}_{m \times R} \qquad B = \begin{bmatrix} \quad \end{bmatrix}_{K \times n}$$

$$A_m \times B = R_{m \times n}$$

$A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ $B = \begin{bmatrix} 5 & 6 \\ 7 & 8 \end{bmatrix}$

$2 \times \begin{bmatrix} 2 & 2 \\ \text{cols} & \text{rows} \end{bmatrix} \times 2$

$R = \begin{bmatrix} 5+14 & 6+16 \\ 15+28 & 18+32 \end{bmatrix} \Rightarrow \begin{bmatrix} 19 & 22 \\ 43 & 50 \end{bmatrix}$

→ Graph Definition:

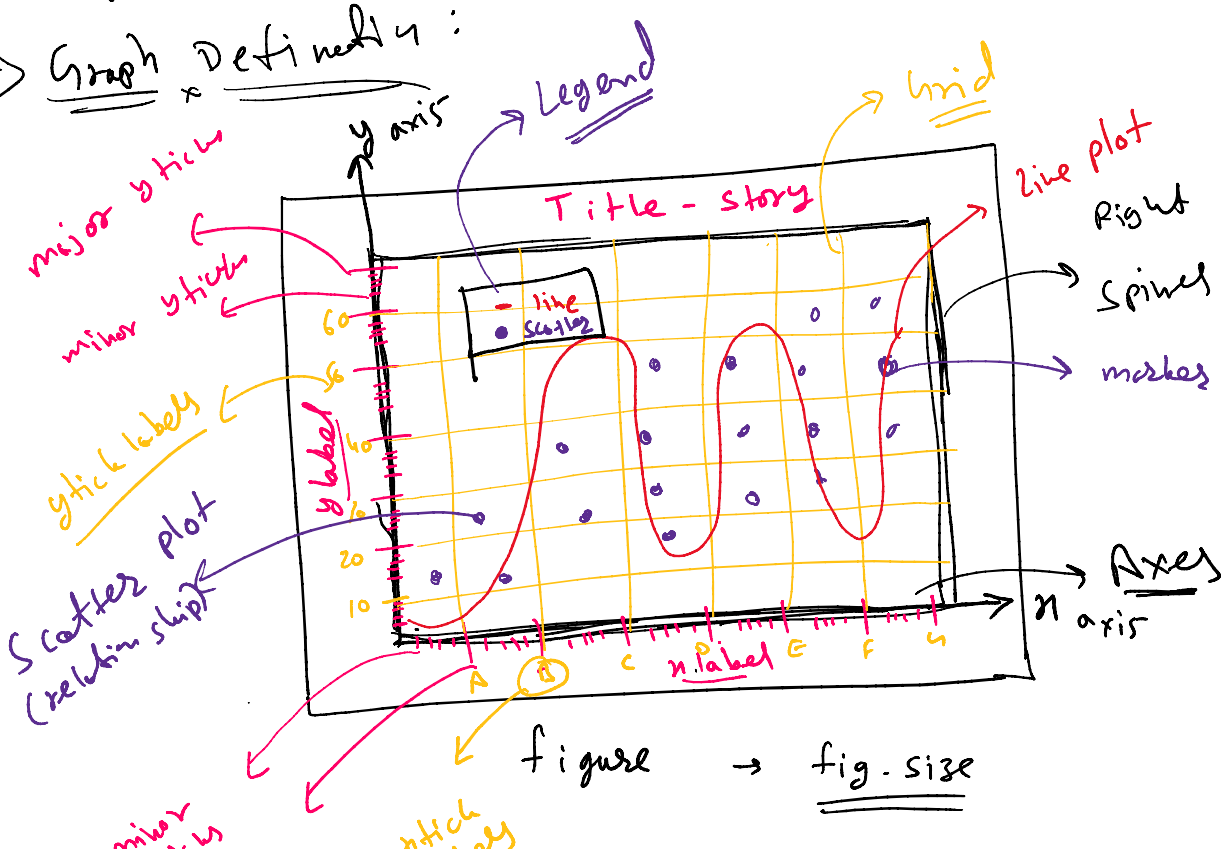


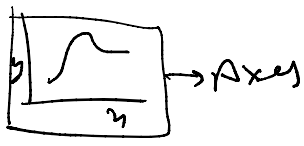
figure → fig.size

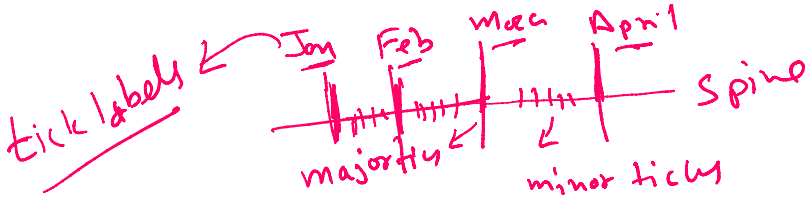
Axis x, y

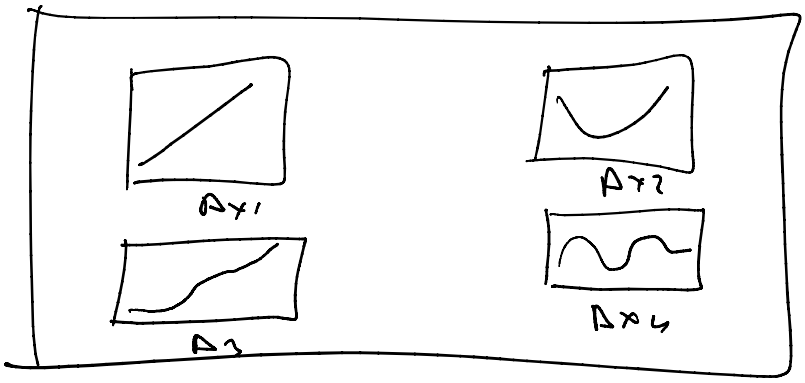
Axes →

↓

Graph







fig