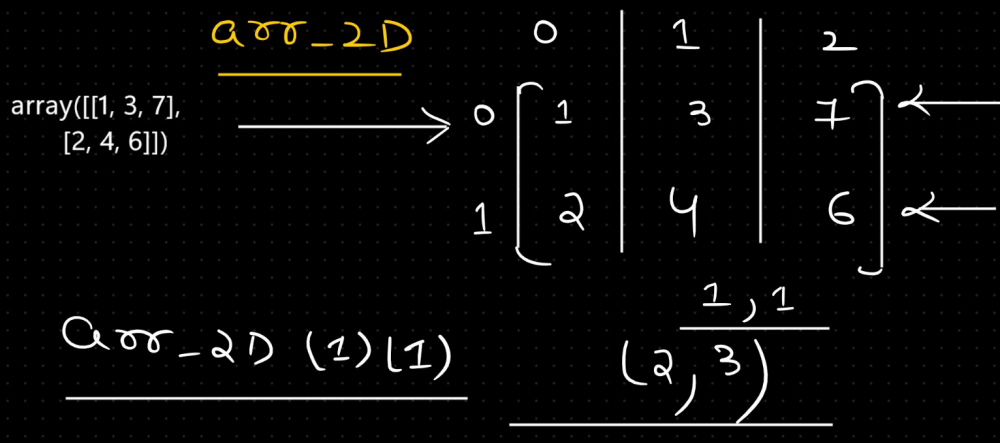
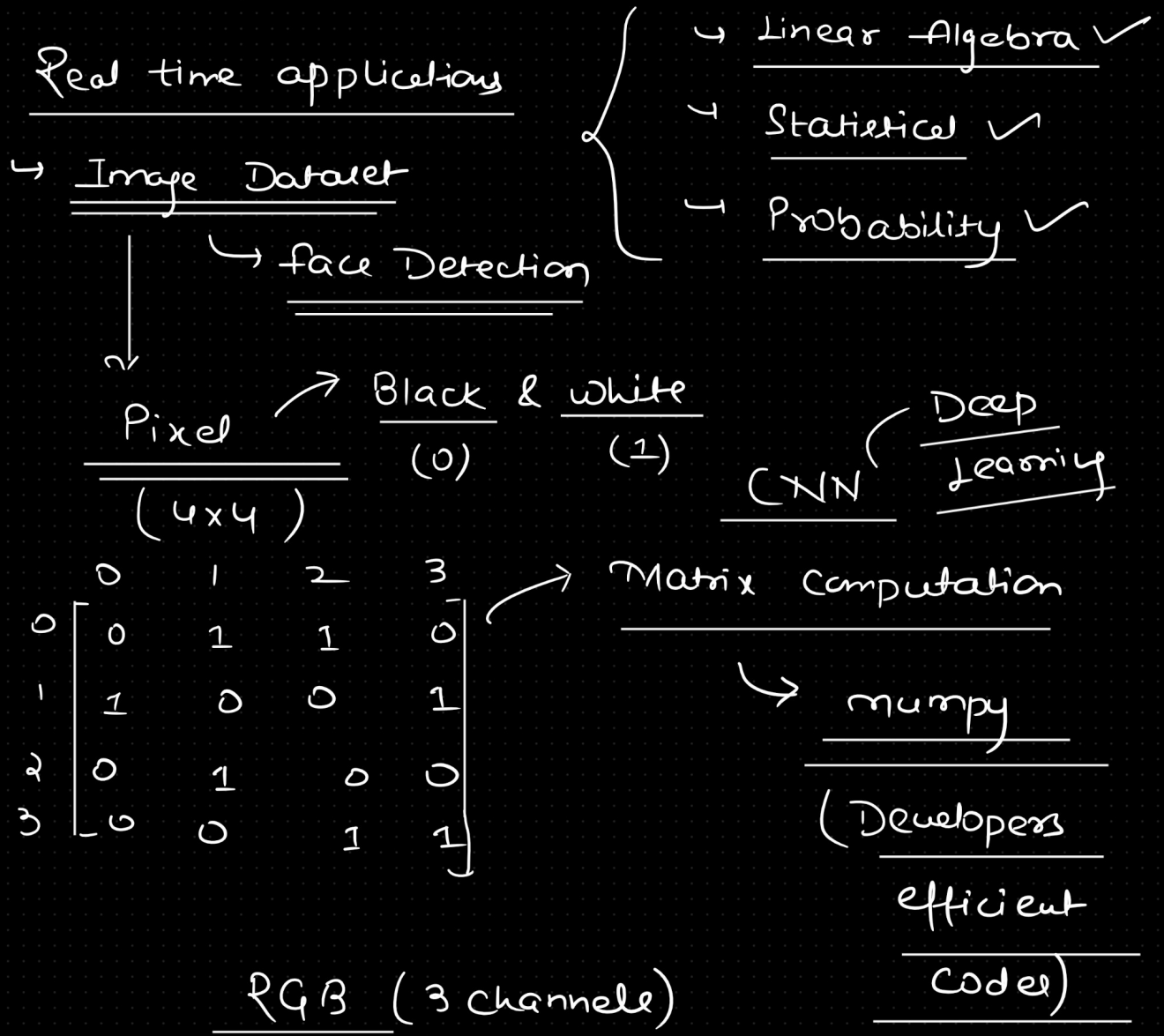


Numpy Package → fast mathematical operations

NumPy is the fundamental package for scientific computing in Python. It is a Python library that provides a multidimensional array object, various derived objects (such as masked arrays and matrices), and an assortment of routines for fast operations on arrays, including mathematical, logical, shape manipulation, sorting, selecting, I/O, discrete Fourier transforms, basic linear algebra, basic statistical operations, random simulation and much more.



array([[[1, 3],
[2, 4]],
[[2, 6],
[7, 9]]])

3-Dimensional shape

(2, 2, 2)

column

row

count

arr_3D_v2[0]

array([[[1, 3],
[2, 4]],
[[2, 6],
[7, 9]]])

[[2, 6],
[7, 9]]

[[2, 3],
[7, 12]]])

arr_3D_v2[1]

0 1
0 1
1 2
2 4

2D array

0 1
0 1
1 2
2 6
3 9

0 1
0 2
1 3
2 12

0 1 2
0 1 2
1 4 5
2 3 6
3 10

Original data

Heap

Shallow copy

Shallow-copy data

1 2 3
4 5 6

Deep copy

original data

[1 2 3]
[4 5 6]

✓ deep-copied data

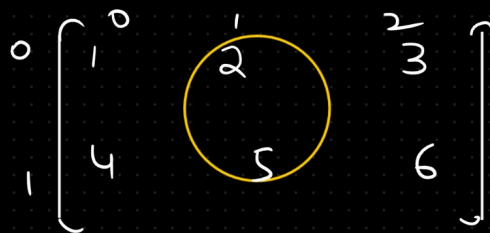
[1 2 3]
[4 5 6]

	0	1	2	3	4
0	0	0	0	0	0
1	0	1	2	3	4
2	0	2	4	6	8
3	0	3	6	9	12
4	0	4	8	12	16

(i * j)

i == j

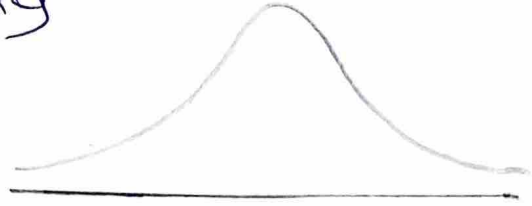
	0	1	2	3
0	True	false	false	false
1	f	True	f	f
2	f	f	True	f
3	f	f	f	True



Central Limit Theorem

↳ Normal/Gaussian Distribution

PDF: Probability Density Function



$$f(x) = \frac{1}{\sqrt{2\pi\sigma^2}} e^{-\frac{(x-\mu)^2}{2\sigma^2}}$$

Range ← . Standard Normal Distribution
 $\mu=0, \sigma=1$

Normalize in some specific range

EDA → Normalize the value in some specific range.

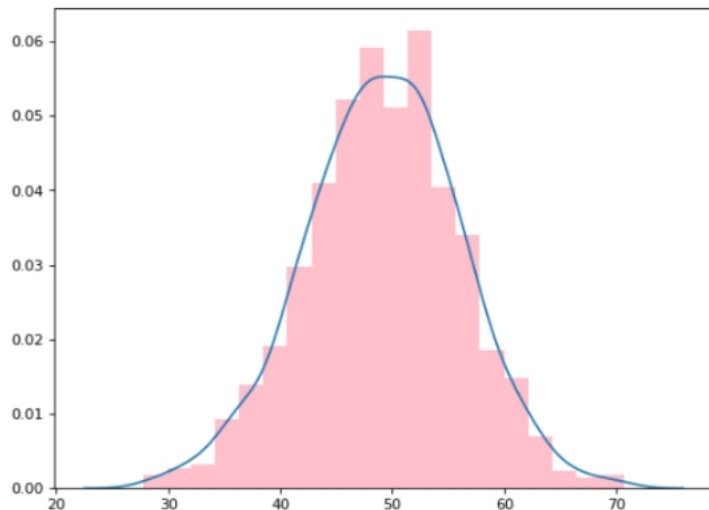
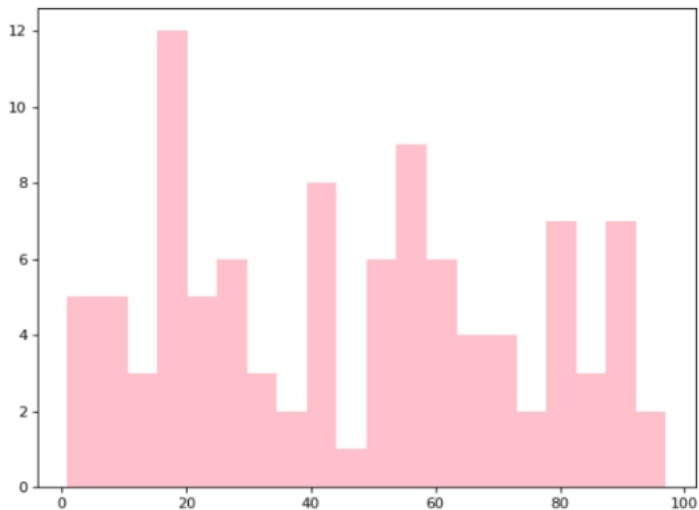
→ SNF

Z Score

$$Z = \frac{x_i - \mu}{\sigma}$$

CENTRAL LIMIT THEOREM

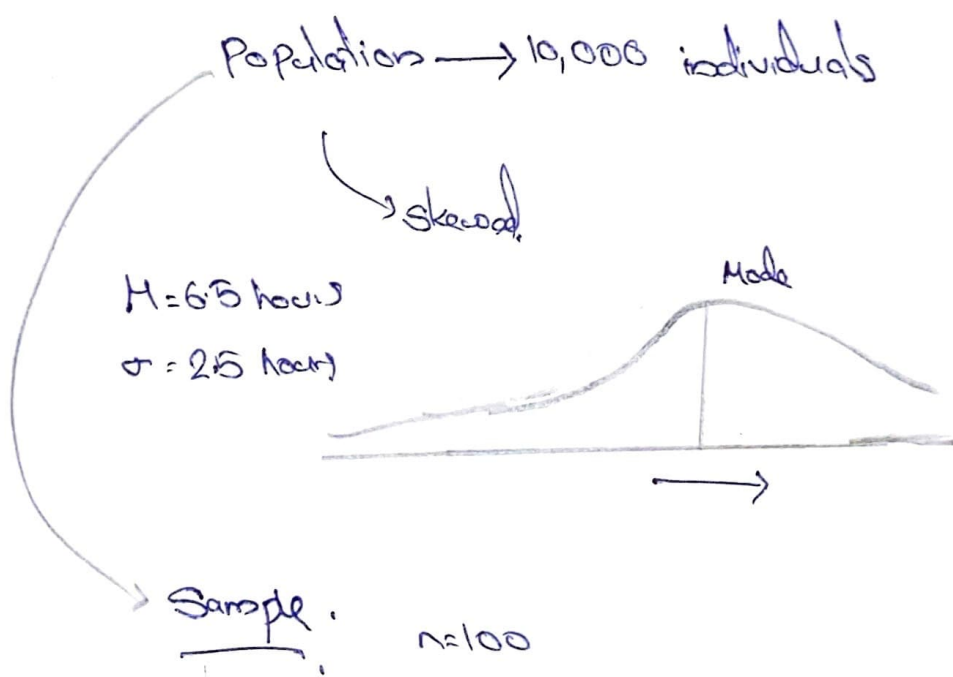
WHAT IS IT AND WHY IS IT USEFUL?



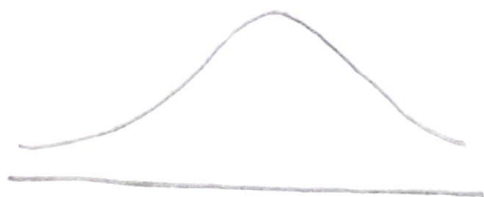
Doesn't matter what is the distribution of Population

Sample $n = 30$

Q. A Survey says an Average number of hours People sleep at night



Report these 10 entries the
we get Normal distribution



Assumption

sample mean $= 6.7h$
 $2\sigma = 6.3h$

Sample $10M = 6.8h$