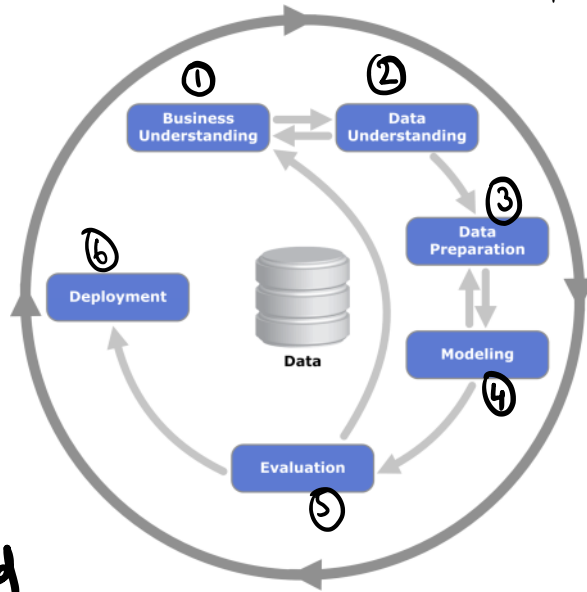


Python , Data Science Process

library
↳ contains
Python
modules and
Packages.



numpy , Pandas ,
Matplotlib seaborn

* To predict Price of a house.

* Business
① Area of house
② No of rooms.

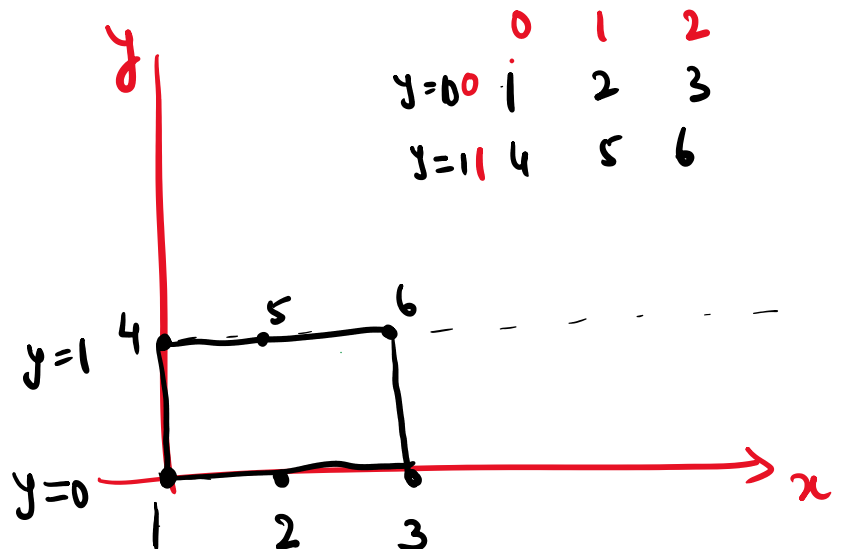
* Data Understanding
(Exploratory
Data Analysis)

→ Univariate
analysis.
(one feature
at a time)

→ Bivariate
→ Multivariate

✓ * Data Preparation
* ML modelling

array $\begin{bmatrix} 1, 2, 3 \\ 4, 5, 6 \end{bmatrix}$

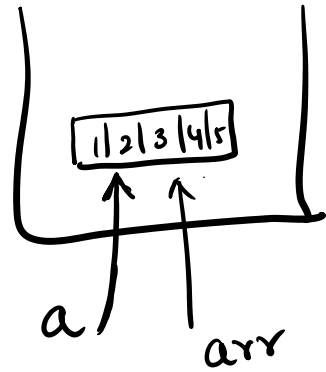


arr = array([1, 2, 3, 4, 5])

a = arr

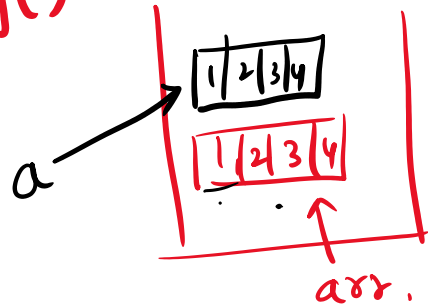
Shallow Copy

{ Whenever you change arr then a will also change.



a = arr.copy()

Deep Copy

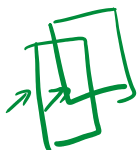


np.fromfunction(lambda i, j : i == j, (3, 3))

	0	1	2
0	True	False	False
1	False	True	False
2	False	False	True

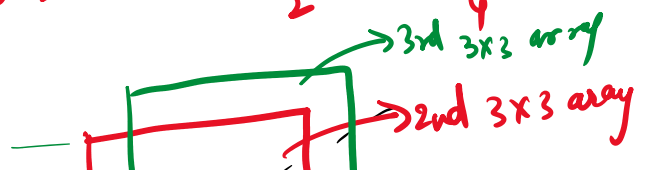
i x j

	0	1	2
0	0x0	0x1	0x2
1	1x0	1x1	1x2
2	2x0	2x1	2x2

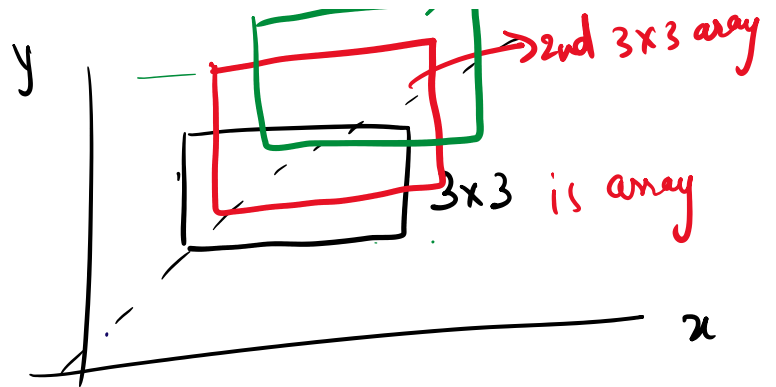


np.fromfunction(1, 3, 3)

y |



np.zeros(1, 3, 3)
 ↓ ↓
1d 2d



z axis
 1+5 1+5 1+5
 1 1 1
arr + 5

arr + 5

index wise addition

$\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix}$ $\begin{bmatrix} 7 & 8 & 9 \\ 10 & 11 & 12 \end{bmatrix}$

$\begin{bmatrix} 1+7 & 2+8 & 3+9 \\ 4+10 & 5+11 & 6+12 \end{bmatrix}$

Indexwise Subtraction

$\begin{bmatrix} 2 & 2 & 1 \\ 1 & 1 & 1 \\ 1 & 2 & 2 \end{bmatrix}$ $\begin{bmatrix} 1 & 2 & 2 \\ 1 & 2 & 1 \\ 2 & 1 & 1 \end{bmatrix}$

$\begin{bmatrix} 2-1 & 2-2 & 1-2 \\ 1-1 & 1-2 & 1-1 \\ 1-2 & 2-1 & 1-1 \end{bmatrix}$

Index wise multiplication

index wise multiplication

1-2

2-1

1-1

2x1

1x1

1x2

2x2

1x2

2x1

1x2

1x1

2x1

~~Matrix multiplication / dot product~~

$$\begin{bmatrix} 2 & 2 & 1 \\ 1 & 1 & 1 \\ 1 & 2 & 2 \end{bmatrix}$$

✓ 3x3

$$\begin{bmatrix} 1 & 2 & 2 \\ 1 & 2 & 1 \\ 2 & 1 & 1 \end{bmatrix}$$

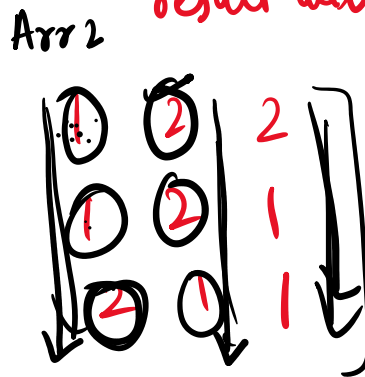
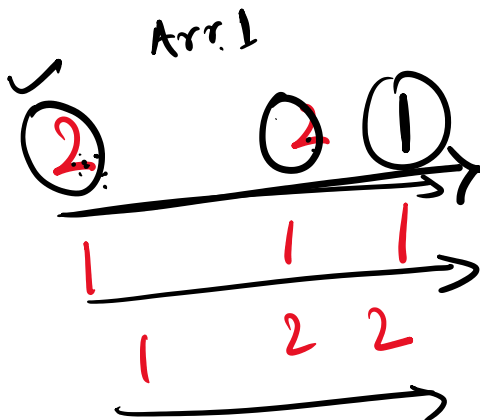
3x3

m x n

p x q

n = p then only two matrix can be mult

result will be m x q



$$\begin{bmatrix} 2 \times 1 + 2 \times 1 + 1 \times 2 & 2 \times 2 + 2 \times 2 + 1 \times 1 & 2 \times 2 + 2 \times 1 + 2 \times 1 \\ 1 \times 1 + 1 \times 1 + 1 \times 2 & 1 \times 2 + 1 \times 2 + 1 \times 1 & 1 \times 2 + 1 \times 1 + 1 \times 1 \\ 1 \times 1 + 2 \times 1 + 2 \times 2 & 1 \times 2 + 2 \times 2 + 2 \times 1 & 1 \times 2 + 2 \times 1 + 2 \times 1 \end{bmatrix}$$

$$\begin{bmatrix} 6 & 9 & 7 \\ 4 & 5 & 4 \\ 7 & 8 & 6 \end{bmatrix}$$

arr + 5

$$\begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix} + \begin{bmatrix} 5 & 5 & 5 \\ 5 & 5 & 5 \end{bmatrix}$$

$$\begin{pmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \end{pmatrix} + \begin{pmatrix} 5 & 5 & 5 \\ 5 & 5 & 5 \end{pmatrix}$$

$$\checkmark \begin{pmatrix} 5 & 5 & 5 \\ 5 & 5 & 5 \\ 5 & 5 & 5 \end{pmatrix} \Leftarrow \begin{matrix} 0+5 & 0+5 & 0+5 \\ 0+5 & 0+5 & 0+5 \\ 0+5 & 0+5 & 0+5 \end{matrix}$$

$$\begin{pmatrix} 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{pmatrix} \quad a = \begin{pmatrix} 1 & 2 & 3 & 4 \end{pmatrix}$$

$$\begin{pmatrix} 1 & 2 & 3 & 4 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{pmatrix} + \begin{pmatrix} 0 & 0 & 0 \\ 1 & 2 & 3 & 4 \\ 0 & 0 & 0 \end{pmatrix} + \begin{pmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 1 & 2 & 3 & 4 \end{pmatrix}$$

$$\begin{pmatrix} 1 & 2 & 3 & 4 \\ 1 & 2 & 3 & 4 \\ 1 & 2 & 3 & 4 \end{pmatrix}$$

$$b = \begin{pmatrix} 3 \\ 3 \\ 2 \end{pmatrix}$$

$$\begin{cases} 7x + 5.3y - 3z = 2 \\ 2x + 3y - 2z = 3 \\ 3x + 5y - 3z = 2 \end{cases}$$

$$\checkmark a = \begin{pmatrix} 7 & 5.3 & -3 \\ 2 & 3 & -2 \\ 3 & 5 & -3 \end{pmatrix}$$