

3/10/23

Day -> 4  
WEEK

Date: 2023

Numpy → TR

2 GB Dataset → Create copy of this Dataset  
by applying Diff operations

2GB 2GB 2GB 2GB

Case ①

$a = [0, 1, 2, 3]$

$a[1] = 1$

$b = \begin{bmatrix} 1, 2 \\ 3, 4 \end{bmatrix}$  → shallow copy

→ How to check they are linked to same memory?

→ change in a or b & check in another

Share memory →

`mprotect()`

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$$\text{Q} \rightarrow a = [1, 2, 3, 4]$$

$$c = a * 2$$

$$c = [2, 4, 6, 8] \rightarrow \text{Deep copy}$$

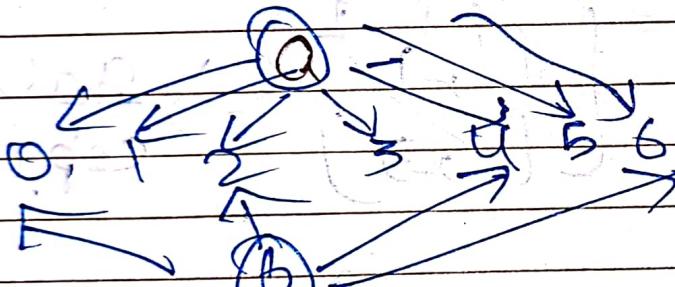
Shallow copy  $\rightarrow$  when memory are shared

Deep copy  $\rightarrow$  when memory are not shared

Ques 15  $\rightarrow$   $a = [1, 2, 3, 4, 5, 6]$

$$b = a[3:2]$$
$$b = [0, 2, 4, 6]$$

Shallow copy



Share the Memory

Case 4  $\rightarrow$  Masking  $\rightarrow$

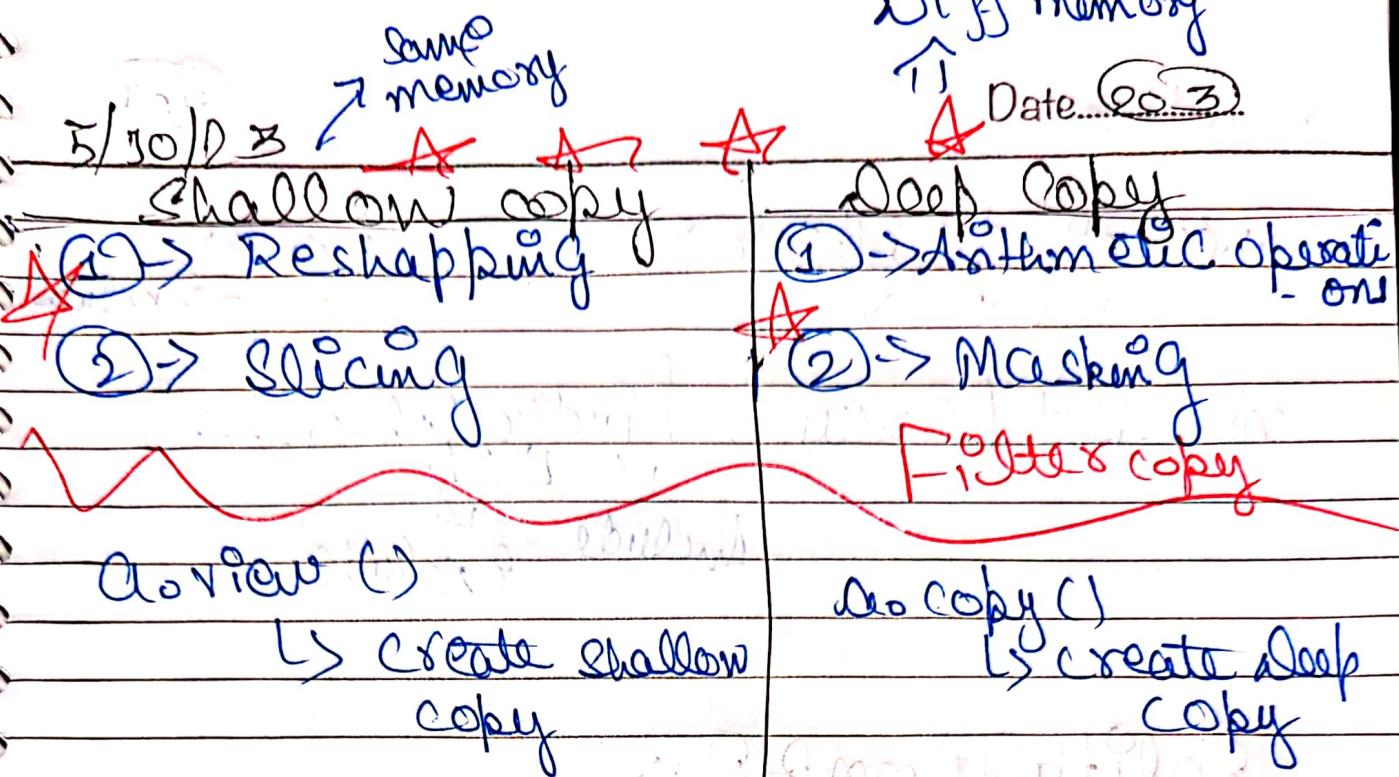
$$a = [1, 2, 3, 4]$$

$$b = a[a > 0]$$

$$\text{Deep copy} \left\{ \begin{array}{l} b = [1, 2, 3, 4] \\ b[0] = 10 \end{array} \right.$$

$a[0] \rightarrow 0 \rightarrow$  will remain zero

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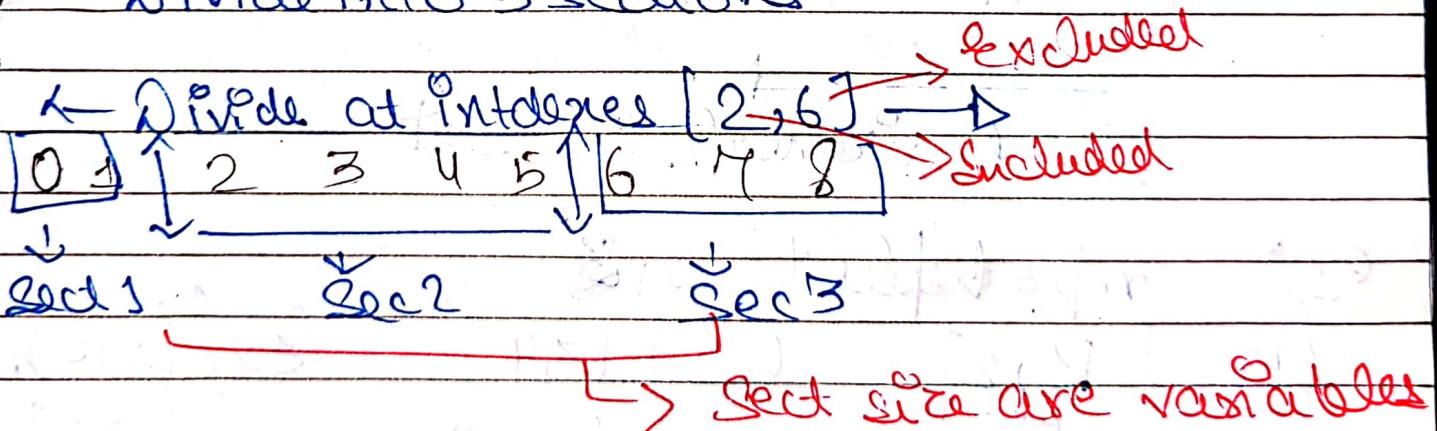


## Splitting Data →

Sec 1      Sec 2      Sec 3

1 0 1 2 3 4 5 6 7 8 → Equal Sec created

Divide into 3 sections



Equal section → np.linspace(0, 1, No)

Note → array No should be divisible by  
No of section

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Unequal splitting  $\rightarrow$

Include



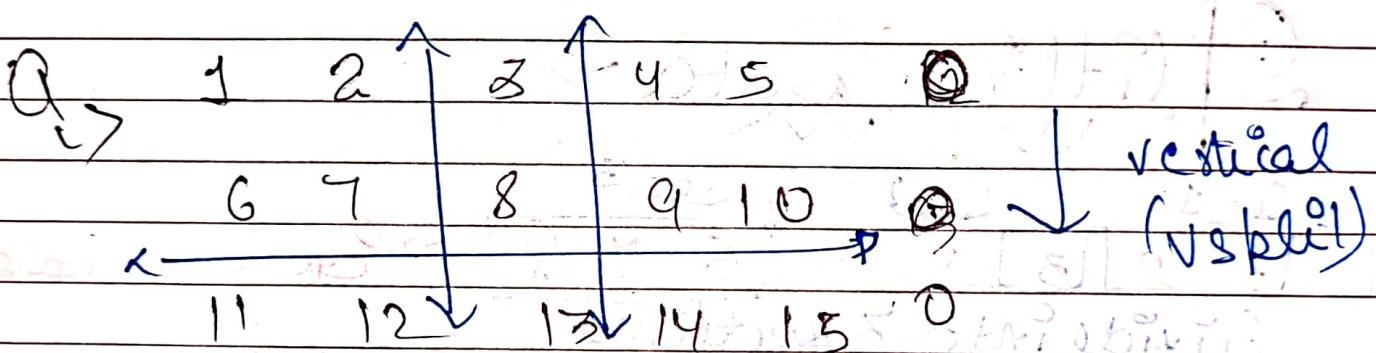
Exclude

`nfo.split(array, [index, index, ...])`

Include

Exclude

Splitting on 2D  $\rightarrow$



e.g. `nfo.hsplit(a, 2)`

①  $\{[1, 2], [6, 7], [11, 12]\}$

②  $\{[3, 4], [8, 9], [13, 14]\}$

③  $\{[5, 0], [10, 0], [15, 0]\}$

Or `nfo.vsplit(a, 3)`

$\{[1, 2, 3, 4, 5, 0], [6, 7, 8, 9, 10, 0], [11, 12, 13, 14, 15, 0]\}$

$\{[6, 7, 8, 9, 10, 0], [11, 12, 13, 14, 15, 0]\}$

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Note  $\rightarrow$  \*

\* They both have unequal splitting also

Stacking  $\rightarrow$

adding  
rows

$\leftarrow$  V stack

while stacking  
vertically

{  
no of  
cols should  
be same}

H stack

16. f | adding  
column

{  
no of rows  
should be same}

$\rightarrow$  Stacking  
Horizontally

N stacks

mpnstack ((a, b, c))

(axis = 0)

Order can change  
also  $\rightarrow$  b, c, a

(axis = 1)

h\_stack  $\rightarrow$  mpnstack (( $\square$  order  
b, a, c))

No of Rows  $\rightarrow$  should  
match

Input

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~~ex -> [Vstack]~~ work in a trading company maintaining data for particular stocks from 2016 to 2022

2023-> over

↳ to add this year Data in this we use vstack

~~Cx -> [hstack] -> Maintain A & B of class~~

Name, Phn, Roll No

wanna add a location col to this data set

~~hstack & vstack → Together~~

~~But issue → Cannot happen on diff dim must have same dimension~~

Concatenate

axis = 0 → Row stacking → vstack  
np.concatenate ([order], axis=0)

★ No of column should be equal

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axis → 1 → column wise stacking  
↳ hstack

np.concatenate ([a, b], axis=1)  
(a, b)

→ No of Rows Should be equal

axis = None

$$a = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}, b = \begin{bmatrix} 3 & 5 \\ 7 & 8 \end{bmatrix}$$

np.concatenate ([a, b], axis=None)

⇒ 1 2 3 4 3 5 7 8

order [b, a] → 3 5 7 8 1 2 3 4

Flatten → a = [1 2]  
[3 4]

a.flatten() → 1 2 3 4

→ Flatten only works on one 1 array  
while concatenate convert 2 arrays  
in 1-D array.

$$\begin{array}{r} \underline{-5} \\ | \\ 10 ) 23 \end{array}$$

# Assignment

Date 208

① → Add padding

## Padding of

$$\begin{array}{r} \cancel{1} \quad 2 \\ \underline{-} \quad 3 \quad 4 \\ \hline \end{array} \xrightarrow{\text{Carry 1}} \begin{array}{r} 0 \quad 0 \quad 0 \quad 0 \\ 0 \quad 1 \quad 2 \quad 0 \\ \hline \end{array}$$

$$\text{cole} = \det(\text{mat}[\text{obj}])$$

$$A = \begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix}$$

`red = np.vstack ([ray mat])`

$\text{res} = \text{npovstack}([\text{res}, a])$

$$Y_{\text{ANS}} = \text{len}(\text{ans})$$

```
a = np.zeros((rows, dtype='int')).reshape(rows, 1)
```

`res = np.hstack([res, a])`

$$res = np.array([a_1, a_2])$$

~~return res~~

Column split

MXN 2-D array (M, N)

Subarray = np.array([1, 2, 3])

(3) → split second

subarray = np.split (arr, k)

W Wise Splat

0	1	2	3
4	5	6	7
8	9	10	11
12	13	14	15

$\text{mb} \circ \text{split}(\text{arr}, u)$

arr1 [ 0 1 2 3 ]

2 [4 5 6 7]

$\begin{matrix} 5 & [7 \quad 9 \quad 10 \quad 11] \\ 4 & [12 \quad 13 \quad 14 \quad 15] \end{matrix}$

Date 209

5, 10, 2, 3

⑤  $\rightarrow$  filter copy

$\text{arr} = \text{np.array}([1, 2, 3, 0, -2, 4])$

①  $\rightarrow \text{arr1} = \text{arr} \geq 0 \rightarrow$  Deep copy

②  $\rightarrow \text{arr1} = \text{arr}[:5] \rightarrow$  Shallow copy

③  $\rightarrow \text{arr1} = \text{arr}[\text{arr} > 0] \rightarrow$  Deep

④  $\rightarrow \text{arr1} = \text{arr.reshape}(2, 3) \rightarrow$  Shallow copy

⑤  $\rightarrow$  Inter dimension

\* 3 array [depth, row, column]

$\left[ \begin{array}{c} [[0, 1, 2], \\ [3, 4, 5], \\ [6, 7, 8]] \end{array} \right]$   $\rightarrow$  3 Row & 3 col

depth 1  $\left[ \begin{array}{c} [(9, 10, 11), \\ (12, 13, 14), \\ (15, 16, 17)] \end{array} \right]$   $\text{arr}[1, :, :]$

option B  $\rightarrow$

$\left[ \begin{array}{c} [9, 10, 11], \\ [12, 13, 14], \\ [15, 16, 17] \end{array} \right]$

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## A- Additional Problems

① → Hstack →

arr →	1	2	3
	4	5	6
	7	8	9

$\text{arr}[:, 0] \rightarrow [1, 4, 7]$

$\text{arr}[:, [0]] \rightarrow [[1], [4], [7]]$

② → np.hstack((arr, arr[:, 0])) → shape = (3, 4)

③ → np.hstack((arr, arr[:, [0]])) → shape = (3, 4)

④ → np.hstack([arr, arr[:, [0]]]) → shape = (4, 3)

⑤ → np.hstack((arr, arr[:, [0]])) → Throw Error

⑥ → Stack up → used to stack arrays column wise

option ⑥ → hstack

⑦ → Split the difference (Error)

⑧ → arr = np.arange(10)  
np.split(arr, 3)

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### ④ → Row wise column →

Given a 2-D array, which of the following will split the array row-wise?

split [ Row wise → vsplit() ← option ②  
col wise → hsplit()

Stacking [ Rowsie → vstack()  
Col wise → hstack()

### ⑤ → Copy types

c0 = arr → Deep  
 $\text{arr}[0] = 12$

c1 = arr.view() → shallow  
 $\text{arr}[0] = 12$

c2 = arr.copy()  
 $\text{arr}[0] = 12 \rightarrow \text{Deep}$

option ① → c1 represents shallow & c2 → deep  
option ③ → If arr & c1 are printed after line 4 &  
7 respec., they would have printed 12 as  
first element.

### ⑥ → Dark dimension

$\left[ \left[ [0, 1], [2, 3] \right], [4, 5], [6, 7] \right]$

Both rows  
0:  
arr [ : , 0 : , [ ] ] ?  
↓  
excluded  
N  
only 0th column  
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