

Numpy

Broad casting

Vectorization

np.vsplit } concat.

Matrix multiplication

A

$$\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix} \quad 2 \times 3$$

B

$$\begin{bmatrix} 4 & 5 \\ 7 & 8 \\ 9 & 10 \end{bmatrix} \quad 3 \times 2$$

np.matmul
 np.dot
 a @ b

~~2 × 3 × 2 × 3~~
Broad casting

One message share to all

$$\begin{bmatrix} 1, 2, 3 \end{bmatrix}$$

+

✓

$$\begin{bmatrix} 0, 2, 3 \end{bmatrix}$$

$$\begin{bmatrix} 4, 5 \end{bmatrix}$$

X

$$1+4 \quad [+5]$$

② Rules

① Dimensions of array needs to be same

element wise add

The diagram illustrates the computation of $\text{A} \odot \text{B} + \text{C}$ through two different sequences of operations:

- Row 1 (Left):** $(\text{A} \odot \text{B}) + \text{C}$
- Row 2 (Right):** $\text{A} + (\text{B} \odot \text{C})$

Matrix A:

0	1	2
10	10	10
20	20	20
30	30	30

Matrix B:

0	1	2
0	1	2
0	1	2
0	1	2

Matrix C:

0	0	0
10	10	10
20	20	20
30	30	30

Element-wise Multiplication (\odot):

0	1	2
10	10	10
20	20	20
30	30	30

Matrix Addition (+):

0	0	0
10	10	10
20	20	20
30	30	30

0 1 2 3
4 5 X

Broadcasting — element wise Mapping

① → Dimension should exactly match, add 1 in the starting

a = np.arange(0, 40, 10).reshape(4, 1)

np.tile (@, 000)

The diagram illustrates the replication of the 1D array [0, 10, 20, 30] into a 2D array of shape (16, 1) by repeating it four times horizontally. The original array is shown in a vertical brace, and the resulting expanded array is shown in a horizontal brace.

0	0	0	0
10	10	10	10
20	20	20	20
30	30	30	30

$$a = \begin{bmatrix} 0 & 0 & 0 \\ 10 & 10 & 10 \\ 20 & 20 & 20 \\ 30 & 30 & 30 \end{bmatrix}$$

4,3
2

(4,3)

$$(4, 3) \quad (1, 3) \quad \int \quad \underline{\text{Area I}}$$

7, 3, 4, 1

$$(2, 4)$$

(7, 3, h, 1)

(1, 1, 2, 4)

G. 1)

(1, 2, r)

(+, +, +) (x, -, +)

$$\begin{pmatrix} 4, 3 \\ 4 \ 3 \end{pmatrix} = \begin{pmatrix} 1, 3 \\ 1 \\ 4 \ 3 \end{pmatrix}$$

① Dimension should Match , If dimension are not matching add 1 in starting.

② Every element = every element only b/w cart where element is 1

$$a = \begin{pmatrix} 4, 1 \\ 4 \ 3 \end{pmatrix} \quad \begin{pmatrix} 3, \\ 4 \ 3 \end{pmatrix}$$

$$\begin{pmatrix} 4, 1 \\ 4 \ 3 \end{pmatrix} \quad \begin{pmatrix} 1, 3 \\ 4 \ 3 \end{pmatrix}$$

$$\begin{pmatrix} 5 \\ 10 \end{pmatrix} \quad \begin{pmatrix} 2 \\ 10 \end{pmatrix} \quad \begin{pmatrix} 1, 3 \\ 1, 2 \end{pmatrix}$$

$$(8, 1, 6, 1) \quad (7, 1, 5)$$

$$\begin{array}{c} 8, 1, 6, 1 \\ \downarrow \quad \downarrow \quad \downarrow \\ 8 \ 7 \ 6 \ 5 \end{array} \quad \begin{array}{c} 1, 7, 1, 5 \\ \downarrow \quad \downarrow \quad \downarrow \\ 8 \ 7 \ 6 \ 5 \end{array}$$

cm
sas

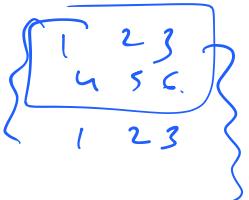
20	30	40
50	60	10

\rightarrow $\boxed{20}$, ~~2~~

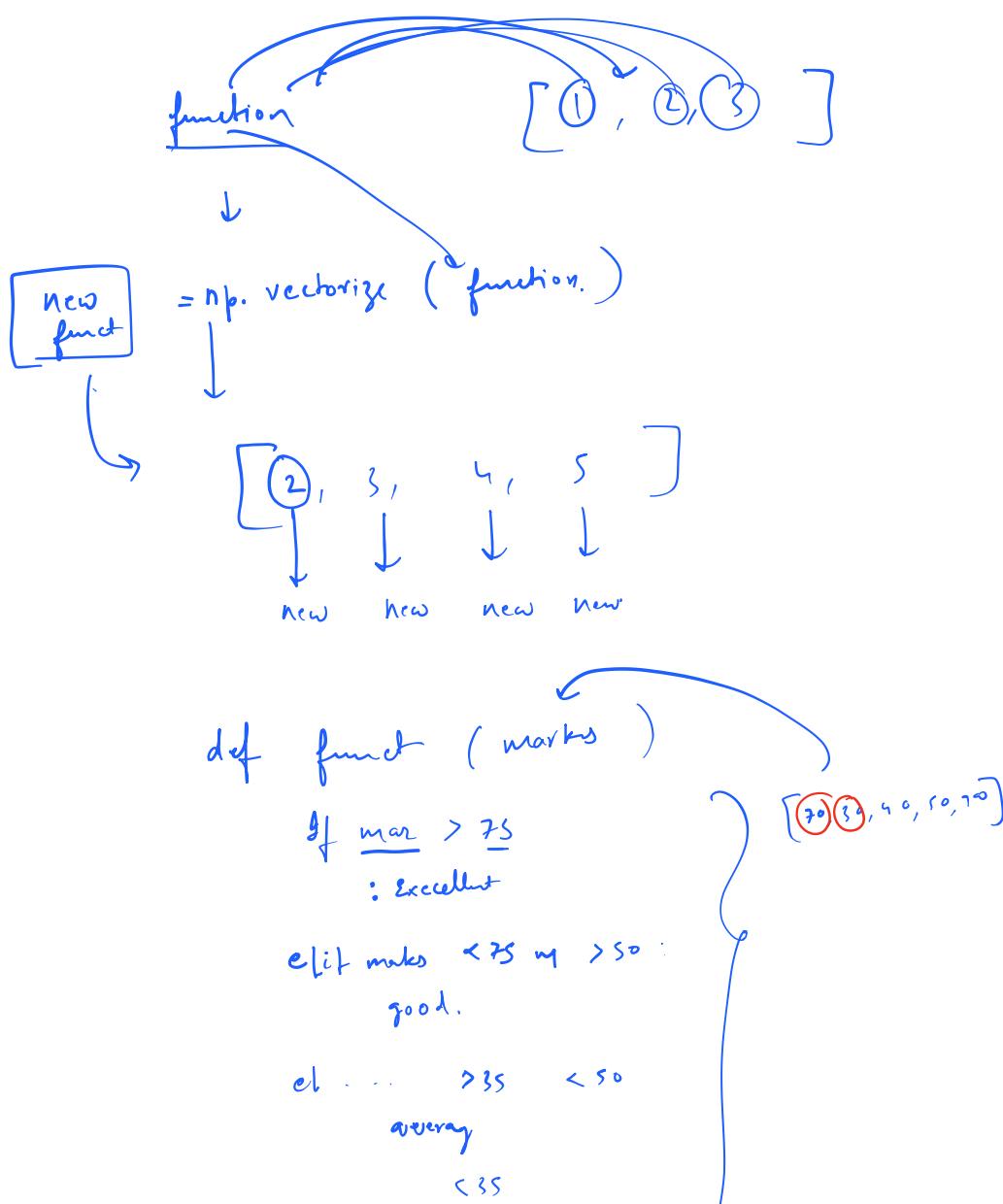
\rightarrow $\boxed{20}$, ~~2~~

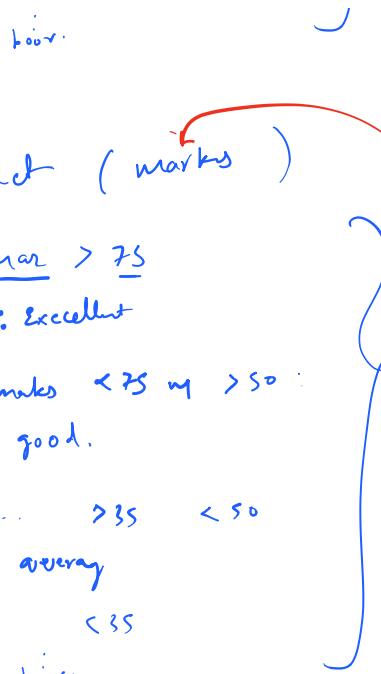
$$\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix} + \begin{bmatrix} 7 & -1 \\ 9 & 0 \\ 0 & 0 \end{bmatrix}$$

~~4, 3~~ (4,) (3,)

What's $\begin{bmatrix} 1 \end{bmatrix}$ 

Vectorization



hour: 

 def funct (marks)

 if mark > 75
 : Excellent

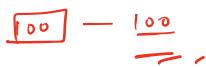
 el if marks < 75 and > 50 :
 good.

 el . . . > 35 < 50
 average

 < 35

 hour:

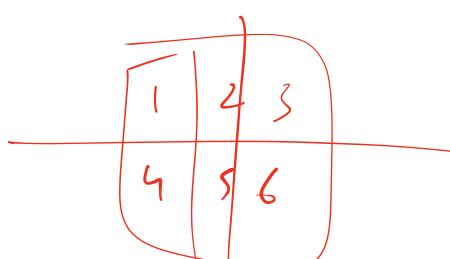

 Thinking Interview 


 - 100

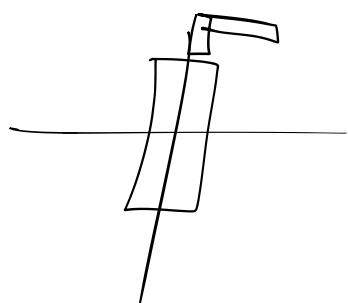
 ↗

array

1	2	3
4	5	6
7	8	9



1	2	3
4	5	6
7	8	9




 axis = 1

1	2	3
4	5	6
7	8	9

$\begin{bmatrix} 0 & 1 \\ 1, 2, \end{bmatrix} \left| \begin{array}{c|cc} 2 & 3 & 4 \\ 3 & 4, 5, 4 \end{array} \right.$ equal split X
 np.split (a, 3) equal 3 split

np.split (a, [2, 4])

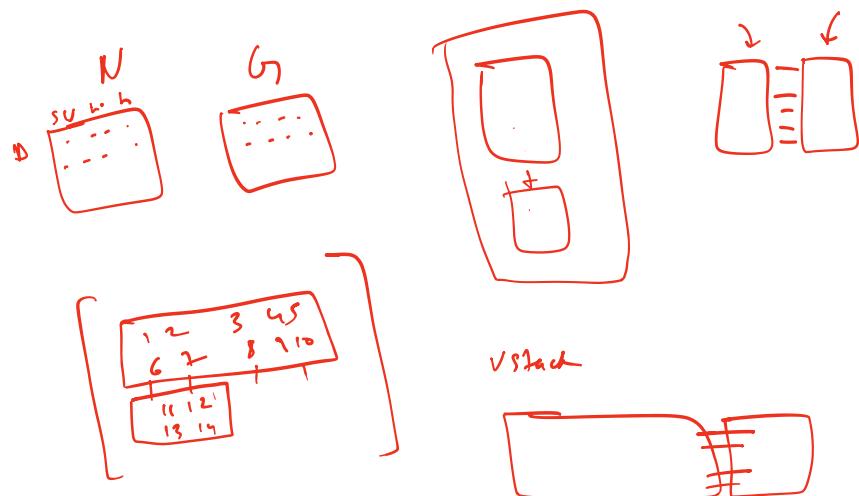
axis=1

0	1	2	3
1	2	3	4
5	6	7	8
10	20	30	30

split (a, [1, 3], axis=1)

$a = \begin{bmatrix} 1 & 2 & 3 \\ 1 & 2 & 3 \end{bmatrix}$ } np.vstack (a, b)

$\begin{bmatrix} 1 & 2 & 3 \\ 1 & 2 & 3 \end{bmatrix}$



cpan

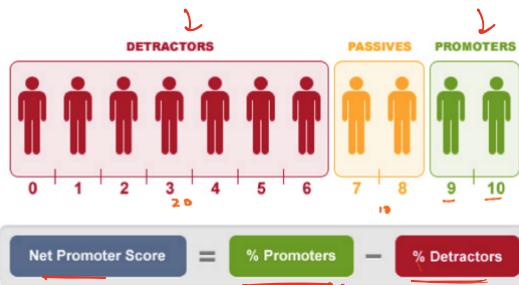
N P S

Net promoter Score.

$\underbrace{1 \ 2 \ \dots}_{\text{...}} \quad \underbrace{\dots}_{\text{...}} \quad \underbrace{9 \ 10}_{\text{...}}$

6

1 - 6
detractors
7 - 8
Natural
9 - 10
+ve



$$\checkmark \text{NPS} \quad [-\underline{100} \quad \underline{100}] \quad \leftarrow \underline{70} \times$$

$$\frac{70}{200} \times 100 \\ 35$$

fit.txt

#date	step_count	mood	calories_burned	hours_of_sleep	active
06-10-2017	5464	Neutral	181	5	Inactive
07-10-2017	6041	Sad	197	8	Inactive
08-10-2017	25	Sad	0	5	Inactive
09-10-2017	5461	Sad	174	4	Inactive
10-10-2017	6915	Neutral	223	5	Active
11-10-2017	4545	Sad	149	6	Inactive
12-10-2017	4340	Sad	140	6	Inactive
13-10-2017	1230	Sad	38	7	Inactive
14-10-2017	61	Sad	1	5	Inactive
15-10-2017	1258	Sad	40	6	Inactive
16-10-2017	3148	Sad	101	8	Inactive
17-10-2017	4687	Sad	152	5	Inactive
18-10-2017	4732	Happy	150	6	Active
19-10-2017	3519	Sad	113	7	Inactive
20-10-2017	1580	Sad	49	5	Inactive
21-10-2017	2822	Sad	86	6	Inactive
22-10-2017	181	Sad	6	8	Inactive
23-10-2017	3158	Neutral	99	5	Inactive
24-10-2017	4383	Neutral	143	4	Inactive
25-10-2017	3881	Neutral	125	5	Inactive
26-10-2017	4037	Neutral	129	6	Inactive

.astyle (int)

* added case study

9545126535

1pm

① → Broadcasting

[1, 2, 3] [4, 5, 6]

1 + 4

2 + 5

3 + 6

✓

1 2 3 7 + 5 X

Jio k \rightarrow $\begin{bmatrix} \underline{42}, \underline{41}, \underline{33}, \underline{22} \end{bmatrix}$ \downarrow Kelvin
 \downarrow
 $\boxed{+273,}$

Rules
 $B \rightarrow \boxed{1} \leftarrow$ all $7, 7000 \dots$

① Hi I AKASH —
② welcome to c

① Dimension should match \checkmark \times

$$\begin{array}{c} R, C \\ (3,3) \end{array} \quad \begin{array}{c} 1 \ 2 \ 3 \\ 4 \ 5 \ 6 \\ 7 \ 8 \ 9 \end{array} \quad \begin{array}{c} [1, 2, 3] \\ (3,1) \end{array} \quad 1$$

$$(3,3) \quad \begin{array}{c} (1, 3) \\ | \\ 3, 3 \end{array}$$

$$\begin{array}{c} 3 \times 1 \\ \text{kg} \\ R_1 \\ R_2 \\ R_3 \end{array} \quad \begin{array}{c} 20 \\ 12 \\ 91 \end{array} \quad \begin{array}{c} 1 \times L \\ \frac{\text{kg}}{1000 \ 1000} \text{ cm} \end{array}$$

$$(3,1) \quad (1,2)$$

$$\begin{array}{c} | \\ 3 \\ 2 \end{array} \quad \begin{array}{c} | \\ 3 \\ 2 \end{array}$$

$$a = \begin{bmatrix} 1, 2, 3, 4, 5 \end{bmatrix}$$

5 — scalar $\times ()$

Vectorization \rightarrow def $f_1(\boxed{\checkmark})$
 $= \begin{cases} < 18 \\ > 18 \end{cases}$ ✓
return x