$$a = \begin{bmatrix} [1, 2, 3] , \\ [4, 5, 6] , \\ [7, 8, 9] \\ [10, 11, 12] \end{bmatrix}$$

$len(a) = $ no. of rows.
$= \boxed{4}$

$len(a[0]) = $ no. of columns
$= \boxed{3}$

transpose $\longrightarrow$

rows $\Rightarrow$ columns
columns $\Rightarrow$ rows.

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

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

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

$$\begin{bmatrix} [1, 4, 7, 10] , \\ [2, 5, 8, 11] \\ [3, 6, 9, 12] \end{bmatrix}$$
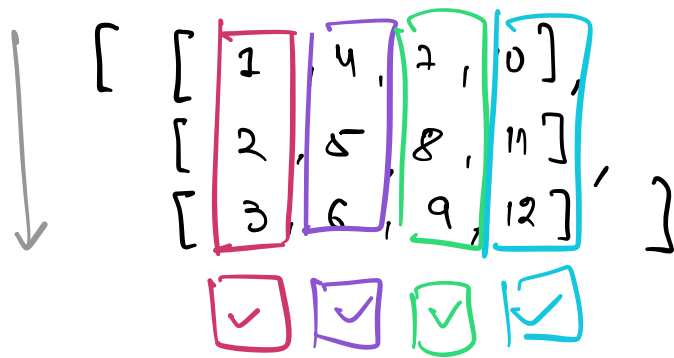
a[3:]

$a = [1, 2, 3, 4, 5]$

$b = [8, 7, 6]$

$b[::-2]$
$[6, 8]$

$$\Big[\ [1, 4, 7, 0], $$
$$[2, 5, 8, 11], $$
$$[3, 6, 9, 12]\ ]', \ \Big] \qquad \longleftarrow \text{np.sum} (a, \ \text{axis}=0)$$

☑ ☑ ☑ ☑

```
array([[ 0,  1,  2,  3,  4,  5,  6,  7],
       [ 8,  9, 10, 11, 12, 13, 14, 15],
       [16, 17, 18, 19, 20, 21, 22, 23],
       [24, 25, 26, 27, 28, 29, 30, 31],
       [32, 33, 34, 35, 36, 37, 38, 39],
       [40, 41, 42, 43, 44, 45, 46, 47],
       [48, 49, 50, 51, 52, 53, 54, 55],
       [56, 57, 58, 59, 60, 61, 62, 63]])
```