

Makes your code run faster.

e.g.

	Apple	Beef	Eggs	Potatoes
carb	56	0	4.4	68
Prot.	1.2	104	52	8
Fat	1.8	135	99	0.9

$= A_{3 \times 4}$

Calculate % of calories from C, P & F for each of 4.

\Rightarrow $Cal = A \cdot \text{sum}(axis=0)$
percentage $= 100 \times A / (Cal \cdot \text{reshape}(1,4))$
 no need to use it. Redundant

e.g. $\begin{bmatrix} 1 \\ 2 \\ 3 \\ 4 \end{bmatrix} + 100 \sim \begin{bmatrix} 100 \\ 100 \\ 100 \\ 100 \end{bmatrix} = \begin{bmatrix} 101 \\ 102 \\ 103 \\ 104 \end{bmatrix}$

$\begin{pmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{pmatrix} + \begin{pmatrix} 100 & 200 & 300 \end{pmatrix}$
 python will convert it to
 $\begin{bmatrix} 100 & 200 & 300 \\ 100 & 200 & 300 \end{bmatrix}$
 ||
 $\begin{bmatrix} 101 & 202 & 303 \\ 104 & 205 & 306 \end{bmatrix}$

General Principle:

$$\begin{array}{ccc} (m,n) & \begin{array}{c} + \\ \times \\ / \end{array} & (1,n) \longrightarrow (m,n) \\ \text{matrix} & & (m,1) \longrightarrow (m,n) \end{array}$$

operate element wise.

\Rightarrow Sum values vertically : axis = 0
operation horizontally : axis = 1

Tips:

Never use rank 1 array.

`a = np.random.randn(5)`

`a.shape = (5,)`

rank 1 array

use properly defined array:

`a = np.random.randn(5,1)`

`a = np.random.randn(1,5)`