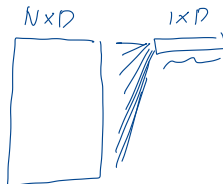


21) array axis

- max, min
- sum, mean ...

random $\left\{ \begin{array}{l} \text{uniform} \\ \text{normal} \end{array} \right.$

기후 데이터 분석.



$$X = \begin{bmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{bmatrix}$$

$$\underline{\text{np.sum}(X)} = \underline{21}$$

$$\underline{\text{np.sum}(X, \text{axis}=0)} = [9 \ 12]$$

$$\text{np.sum}(X, \text{axis}=1) = \begin{bmatrix} 3 \\ 7 \\ 11 \end{bmatrix}$$

Sum, mean,

max, min,

argmax, argmin

$$x_1 = 1$$

$$x_2 = -1$$

$$x_3 = 2$$

$$\min_{i=1,2,3}$$

$$x_1$$

$$= -1$$

$$\arg \max_{i=1,2,3}$$

$$x_i$$

$$\{x_1, x_2, x_3\}$$

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

$$= 3$$

$\max \Rightarrow$ $\text{highest } x_k$

$\arg \max \Rightarrow$ index

$$\begin{array}{cccccc} & 0 & 1 & 2 & 3 & 4 \\ x = & [& 1 & -1 & 2 & -2 & 5 &] \end{array}$$

$$\max(x) = 5$$

$$\underline{\arg \max(x)} = \underline{4}$$

$$X = \begin{bmatrix} \downarrow \downarrow \downarrow \dots \downarrow \\ -X[n,:] - \\ \\ -x_d - \end{bmatrix} \quad \begin{matrix} [z_1 \quad z_2] \\ -z - \end{matrix}$$

$$\text{sum} \left\{ (X[n,i] - z) ** 2 \right\}$$

for d in range(D)

$$t = (X[n,d] - z[d])^2$$

sqr t.

$$X = \begin{matrix} N \times D \\ \left[\begin{array}{c} -x_1^T- \\ -x_2^T- \\ \vdots \\ -x_N^T- \end{array} \right] \end{matrix}$$

$$(X - Z)$$

$$Z = \begin{matrix} N \times D \\ \left[\begin{array}{c} -z- \\ -z- \\ \vdots \\ -z- \end{array} \right] \end{matrix}$$

$N \times D$ matrix.

$$\begin{bmatrix} x_{1,1} & x_{1,2} \\ x_{2,1} & x_{2,2} \\ x_{3,1} & x_{3,2} \\ \vdots & \vdots \end{bmatrix} - \begin{bmatrix} z_1 & z_2 \\ z_1 & z_2 \\ z_1 & z_2 \\ \vdots & \vdots \end{bmatrix}$$

$$\text{np.sqrt}\left\{\text{np.sum}\left((X - Z) ** 2, \text{axis} = 1\right)\right\}$$

$$X = \begin{bmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{bmatrix}$$

3x2
행 열
0 1

$$\text{np.max}(X) = 6$$

$$\text{np.max}(X, \text{axis}=0) = [5 \ 6]$$

$$\text{np.max}(X, \text{axis}=1) = [2 \ 4 \ 6]$$

Sum, mean.

Max, min,

argmax, argmin,

$$x_1 = +1$$

$$x_2 = -1$$

$$x_3 = +2 \Leftarrow$$

$$= -1$$

$$\min_{n=1,2,3}$$

$$x_n$$

$$\arg \min_{n=1,2,3}$$

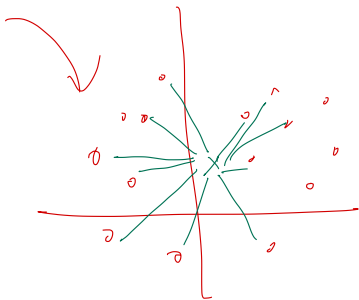
$$x_n$$

$$= 2$$

$$X = \begin{bmatrix} 1 & -1 \\ 2 & 3 \\ 4 & 0 \end{bmatrix} \quad \text{hp,max}(X)$$

$$\underline{X} = \begin{bmatrix} -x_1^T - \\ -x_2^T - \\ \vdots \\ -x_N^T - \end{bmatrix}$$

$$\underline{Z} = -Z^T -$$



$$X = \begin{bmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{bmatrix}$$

3×2

$$\bar{X} = \begin{bmatrix} 1 & 1 \\ 1 & 1 \\ 1 & 1 \end{bmatrix}$$

3×2

$$\sum_{axis=1} (X - \bar{X})^2 = \begin{bmatrix} (1-1)^2 & + & (2-1)^2 \\ (3-1)^2 & + & (4-1)^2 \\ (5-1)^2 & + & (6-1)^2 \end{bmatrix}$$

3×1