for i in range (3): $[0, 1, 2, \cancel{3}]$

$$y[i, :] = x[i, :] + v$$

$$X = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$$

$$v = \begin{bmatrix} 2 & 2 & 2 \end{bmatrix}$$

$y[0, :]$ $x[0, :]$

row ↑ ↑ column

$$\begin{bmatrix} 3 & 4 & 5 \\ 6 & 7 & 8 \\ 9 & 10 & 11 \end{bmatrix}$$

$$= [1, 2, 3] + [2, 2, 2]$$

$$x[1, :] = [4, 5, 6] + [2, 2, 2]$$

$$x[2, :] = [7, 8, 9] + [2, 2, 2]$$

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

$$A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} \qquad B = \begin{bmatrix} 2 & 3 \\ 5 & 6 \\ 7 & 8 \end{bmatrix} \qquad C = \begin{bmatrix} 4 & 1 \\ 1 & 4 \end{bmatrix}$$

$$A + B \neq \qquad A + C = \begin{bmatrix} 5 & 3 \\ 4 & 8 \end{bmatrix}$$

$$A * C = \begin{bmatrix} 4 & 2 \\ 3 & 16 \end{bmatrix}$$

$$\underline{2 \times 3} \qquad 3 \times 2$$

$$A = \begin{bmatrix} 2 & 3 & 1 \\ 1 & 1 & 5 \end{bmatrix}$$

$$A^T = \begin{bmatrix} 2 & 1 \\ 3 & 1 \\ 1 & 5 \end{bmatrix}$$

A dot C = row x column

$$\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}\begin{bmatrix} 4 & 1 \\ 1 & 4 \end{bmatrix} = \begin{bmatrix} 4+2 & 1+8 \\ 12+4 & 3+16 \end{bmatrix} = \begin{bmatrix} 6 & 9 \\ 16 & 19 \end{bmatrix}$$

$(a \times b) \cdot (b \times$

$$m \times n \cdot n \times p = m \times p \cdot \text{deep}$$

correlation

$$3 \times 2 \cdot 2 \times 9 = \underline{\underline{3 \times 9}}$$

$$3 \times 2 = 2 \times 3$$
$$\uparrow \cdot +_\uparrow - \div$$

$$3 \text{ by } 2 \cdot 2 \text{ by } 9 = 3 \text{ by } 9$$
$$2 \text{ by } 9 \cdot 3 \text{ by } 2 \neq$$

$$\text{numbers} = [\overset{5}{\cancel{14}}, \overset{1}{20}, \overset{2}{3}, \overset{3}{.5}, \overset{4}{10}, \overset{5}{\cancel{7}}]$$

$$\begin{matrix} & 4 & 3 & 2 & 1 \end{matrix}$$

⑮

```
output = []
for num1 in numbers:
    Init = numbers[0]
    numbers.pop(0)
    for num2 in numbers:
        output.append(abs(init - num2))
```

Init = 14   Init = 20

$$\text{numbers} = [\cancel{20}, 3, 5, 10, 7]$$

output = [6, $\cancel{11}$, 9, 4, 7]

Guassian dist

output

~~Mala~~ mahalanobis distance

euclidean distance

$$A = \begin{matrix} & 0 & 1 & 2 \\ 0 & 2 & 3 & 5 \\ 1 & 1 & 2 & 3 \\ 2 & 4 & 5 & 6 \\ 3 & 6 & 6 & 6 \end{matrix}$$

row x column

(4 × 3)

A[0, 0] = 2

↑ ↑
row colu.

A[2, $\cancel{3}$] = 9.