

Formules

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1 DISTANCES

L2 in two dimensions.

$$\sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2} \quad (1)$$

L2 in three dimensions.

$$\sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2 + (z_1 - z_2)^2} \quad (2)$$

L1

$$|x_1 - x_2| + |y_1 - y_2| \quad (3)$$

L ∞

$$\max(|x_1 - x_2|, |y_1 - y_2|) \quad (4)$$

weighted L1

$$\alpha_1 |x_1 - x_2| + \alpha_2 |y_1 - y_2| \quad (5)$$

2 LIKELIHOOD

$$L(\theta) = p(x_1, \dots, x_n | \theta) \quad (6)$$

2.1 Exercise 5

$$L(p) = p \times (1 - p) \quad (7)$$

$$L(p) = p - p^2 \quad (8)$$

$$L'(p) = 1 - 2p \quad (9)$$

$L'(p) = 0$ si et seulement si $p = \frac{1}{2}$
Donc max atteint pour $\frac{1}{2}$.

3 DÉRIVÉE

$$f : x \rightarrow f(x)$$

$$f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h} \quad (10)$$

$$\begin{aligned} g : x &\rightarrow 3x \\ \forall x \in \mathbb{R}, g'(x) &= 3 \\ h : x &\rightarrow x^2 \\ h' &= 2x \end{aligned}$$

4 ESPÉRANCE

X constant random variable : $E(X) = \alpha$

$$\sum_{i=1}^n p_i x_i = \sum_{i=1}^n p_i \alpha = \alpha \sum_{i=1}^n p_i \quad (11)$$

5 KMEANS

Inertia :

$$I = \sum_{i=1}^n d(x_i, c_i)^2 \quad (12)$$