

(p.12 - C4.1) k-means: formulae foloind cat. 1 J

Input: $x_1, \dots, x_n \in \mathbb{R}^d$, $k \in \mathbb{N}^+$ n. met. $|J(C, \mu)|$
demon pe cost

Output: k clusters (care eventual minimize cat. J)

Procedura:

Initializ $\mu_1^{(0)}, \dots, \mu_k^{(0)} \in \mathbb{R}^d$, arbitrar, $t=0$
atita timp cit cat de apr nu este satisf, executa:

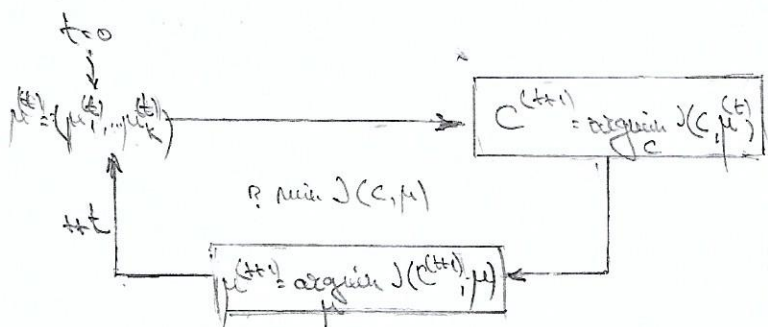
Panul 1: fixind μ , calculeaza

$$C^{(t+1)} = \underset{C}{\operatorname{argmin}} J(C, \mu^{(t)})$$

Panul 2: fixind C , calculeaza

$$\mu^{(t+1)} = \underset{\mu}{\operatorname{argmin}} J(C^{(t+1)}, \mu)$$

++t



(p.12) k-means: formulae foloind var. indicator $\{x_{ij}\}$

Input: $x_1, \dots, x_n \in \mathbb{R}^d$, $k \in \mathbb{N}^+$ ($\{x_{ij}\}$)

Output: k clusters, (care eventual minimize cat. J)

Procedura: (identif p. centrare $\mu_1, \dots, \mu_k$) $\left| \sum_{i=1}^n \sum_{j=1}^k x_{ij} \|x_i - \mu_j\|^2 \right|$

Initializ $\mu_1, \dots, \mu_k \in \mathbb{R}^d$, arbitrar

atita timp cit cat de apr nu este satisf, executa:

Panul 1: $x_{ij} = \begin{cases} 1, & \text{dacă } \|x_i - \mu_j\|^2 \leq \|x_i - \mu_{j'}\|^2, \forall j' \neq j \\ 0, & \text{altfel} \end{cases}$ $\{x_{ij}\}_{i=1, \dots, n; j=1, \dots, k}$

Panul 2: $\mu_j = \frac{\sum_{i=1}^n x_{ij} x_i}{\sum_{i=1}^n x_{ij}}$, $\forall j=1, \dots, k$

