20220017Z019 吴祚旭

8.1 假设每次投掷 $\{X_i\}_{i=1}^{n}$

其中: $X_i = \begin{cases} 1, & 若第i次掷出正面 \\ 0, & 若第i次掷出反面 \end{cases}$

$H(n) = \sum_{i=1}^{n} X_i$

$E(H(n)) = np$

$P(\frac{1}{n}\sum_{i=1}^{n} X_i - p \le -\delta) \le \exp(-2n\delta^2)$

$P(\sum_{i=1}^{n} X_i \le (p-\delta)n) \le \exp(-2n\delta^2)$

$P(H(n) \le (p-\delta)n) \le \exp(-2n\delta^2)$

假设有T个分类器, 每个精误率为ε.

$E[X_i] = 1-\varepsilon$

令 $\delta = (1-\varepsilon) - \frac{1}{2}$

$\delta = \frac{1}{2} - \varepsilon$

$P(\frac{1}{T}\sum_{i=1}^{T} X_i - (1-\varepsilon) \le -\delta) \le \exp(-2T\delta^2)$

$P(\sum_{i=1}^{T} X_i \le \frac{T}{2}) \le \exp(-2T(\frac{1}{2}-\varepsilon)^2)$

$P(H(x) \ne f(x)) \le \exp(-\frac{1}{2}T(1-2\varepsilon)^2)$

202200172019 吴祥旭

$\mu_1 = (6.2, 3.2)$ $\mu_2 = (6.6, 3.7)$. $\mu_3 = (6.5, 3.0)$

$k=3$

$$X = \begin{bmatrix} 5.9 & 3.2 \\ 4.6 & 2.9 \\ 6.2 & 2.8 \\ 4.7 & 3.2 \\ 5.5 & 4.2 \\ 5.0 & 3.0 \\ 4.9 & 3.1 \\ 6.7 & 3.1 \\ 5.1 & 3.8 \\ 6.0 & 3.0 \end{bmatrix}$$

$$d(x_i, x_j) = \sqrt{\sum_{r=1}^{p} (x_{ir} - x_{jr})^2}$$

~~$d(x_1, x_2$~~

$$d(x_i, \mu_j) = \sqrt{(x_{i1} - \mu_{j1})^2 + (x_{i2} - \mu_{j2})^2 + \cancel{(x_{i3} - \mu_{j3})^2}}$$

$$d_{11} = \sqrt{(0.3)^2 + 0^2} = 0.3$$

$$d_{12} = \sqrt{(0.7)^2 + (0.5)^2} = \sqrt{0.74} \approx \cancel{0.88}\ 0.860.$$

$$d_{13} = \sqrt{(5.9-6.5)^2 + (3.2-3.0)^2} = \sqrt{\cancel{0.4}} = \cancel{0.6}\ 0.632$$

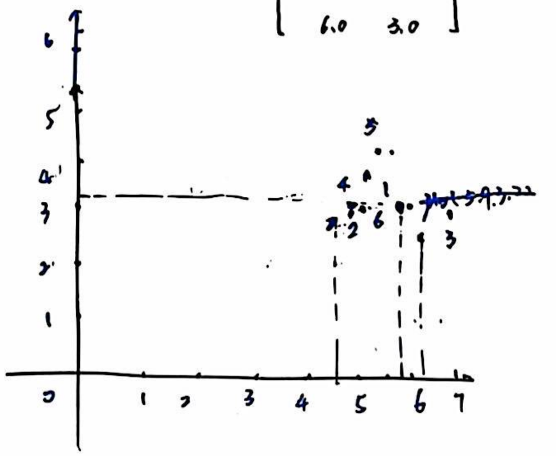
$$d_{21} = \sqrt{(4.6-6.2)^2 + (2.9-3.2)^2} = \cancel{(2.65)^2}\ \sqrt{2.65}$$

$$d_{22} = \cancel{(2.0}\quad \sqrt{4.64}$$

$$d_{23} = \quad \sqrt{3.62}$$

~~d_{31}~~ =

⋮



可知. μ_1类 [1 2 4 6 7 9 10]

μ_2类 [5

μ_3类 [3 8]

(1) 一次迭代后. 红色中心 (5.9, 3.2)

(2) 两次迭代中心 绿色. (6.6, 3.7)

(3) 聚类收敛时蓝色中心 (6.5, 3.0)

(4). 需要 3次迭代才能收敛.