

Homework 4

January 16, 2022

Deadline: 12:00, January 21, 2022

Note: All submissions must be in PDF form.

Submit file name: HM4_YourStudentId.pdf

Problem 1

Given one-dimensional data D , $\mathcal{D} = \{0, 1, 3, 5.5\}$.

Perform clustering using the k-means method with $k = 2$. However, in the initial state, the centroid of the cluster \mathcal{C}_1 is $m_1 = -1$, and the centroid of the cluster \mathcal{C}_2 is $m_2 = 7.5$.

Problem 2

Given two-dimensional data:

$$\begin{bmatrix} -1 & -1 & 0 & 2 & 0 \\ -2 & 0 & 0 & 1 & 1 \end{bmatrix}$$

Dimensionality reduction of this data using the Principal component analysis (PCA).

(follow the 4 steps in PCA, and write out your calculation process, be as detailed as possible.)