1. 题目

这题目按照特殊的做,直接算出答案很简单,

(选做)证明这个答案确实是最小值,可以算是研究生课程的作业.

比如:

Given:

$$\begin{aligned} weight &= [w_1, w_2, \ldots, w_n] \\ location &= [x_1, x_2, \ldots, x_n] \end{aligned} \tag{1}$$

We have:

$$center = \sum_{i=1}^{n} w_i x_i \tag{2}$$

Where $center$ is the **only** solution to minimize $\sum_{i=1}^{n} |w_i x_i - y|_2^2$.

1.1. 解

1.2. 证明

We consider the differential equation:

$$\begin{aligned}\frac{\partial \sum_{i=1}^{n} |w_i x_i - y|_2^2}{\partial y} &= -2 \sum_{i=1}^{n} (w_i x_i - y) = 0 \\ y &= \sum_{i=1}^{n} w_i x_i\end{aligned} \tag{3}$$

1.3. 原题答案

好家伙,带入居然写错了

行吧,我们重新仔细分析

$$\begin{aligned}weight &= [1/3, 0, 1/9, 0, 5/9] \\ location &= [0, 1, 2, 3, 4]\end{aligned} \tag{4}$$

则位置质心为

$$center = \sum_{i=1}^{n} w_i x_i = 22/9 \tag{5}$$

在C与D之间的位置