

Distance measures question 5

$$A = \{5, 8, 2, 1, 14\} \quad B = \{3, 2, 9, 4, 7\}$$

* Euclidean / Squared Euclidean Distance

$$\begin{aligned} d(A, B) &= \sqrt{(5-3)^2 + (8-2)^2 + (2-9)^2 + (1-4)^2 + (14-7)^2} \\ &= \sqrt{4 + 36 + 49 + 9 + 49} \\ &= \sqrt{147} = \underline{\underline{12.12}} \end{aligned}$$

(Squared Euclidean distance = 147.)

* Manhattan Distance

$$\begin{aligned} d(A, B) &= |5-3| + |8-2| + |2-9| + |1-4| + |14-7| \\ &= 2 + 6 + 7 + 3 + 7 \\ &= \underline{\underline{25}} \end{aligned}$$

* Chebyshev Distance

$$\begin{aligned} d(A, B) &= \max \{ |5-3|, |8-2|, \dots, |14-7| \} \\ &= \max \{ 2, 6, 7, 3, 7 \} \\ &= \underline{\underline{7}} \end{aligned}$$