## An Example of Text Clustering with $\boldsymbol{k}$-Means

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Given a set of five points $\{1,2,3,4,5\}$ on an axis, what clusters will the $k$-means clustering algorithm (with $k=2$ ) produce, if 4 and 5 are chosen as the two initial seeds?

Please use Euclidean distance. For example, the distance between points 2 and 5 is 3 .


```
// k-means (k=2)
```

Step (1)

| centres: | 4 | and | 5 |
| :--- | :--- | :--- | :--- |
| clusters: | $\{1,2,3,4\}$ | and | $\{5\}$ |

Step (2)

| centres: | 2.5 | and | 5 |
| :--- | :--- | :--- | :--- |
| clusters: | $\{1,2,3\}$ | and | $\{4,5\}$ |

Step (3)
centres: 2 and 4.5
clusters: $\{1,2,3\}$ and $\{4,5\}$

Done!

