

# Clustering

- K means
- Hierarchical

# Customer Segmentation

Goal: To make 3 marketing strategies

Age (in years)

Engagement with the page (in days/week)

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Eng. 7



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Eng. 2



Age: 49  
Eng. 1



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Age: 40  
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Age: 20  
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engagement  
(times/week)

7

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5

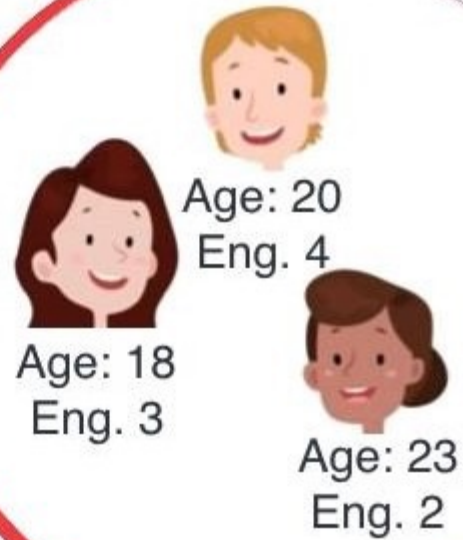
4

3

2

1

**Strategy 1**



20

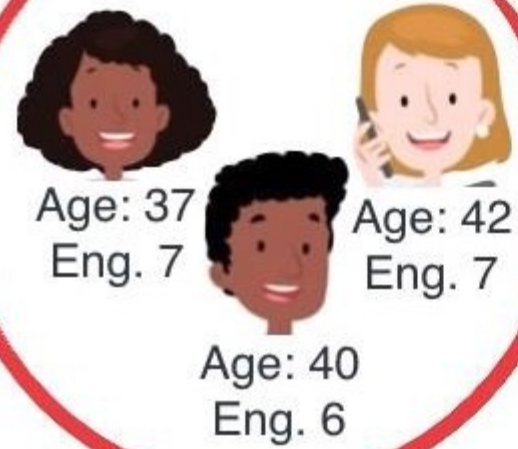
30

40

50

age

**Strategy 2**



**Strategy 3**



# K-means clustering



engagement  
(times/week)

7

6

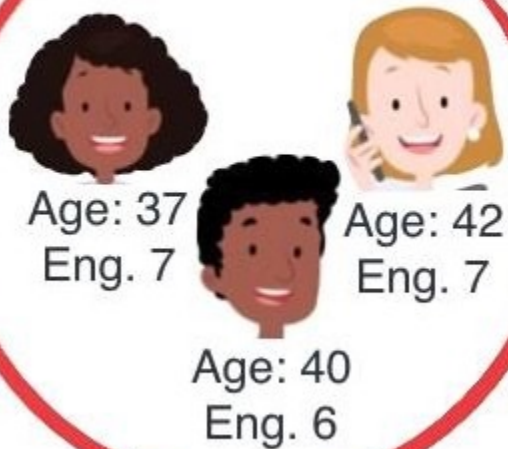
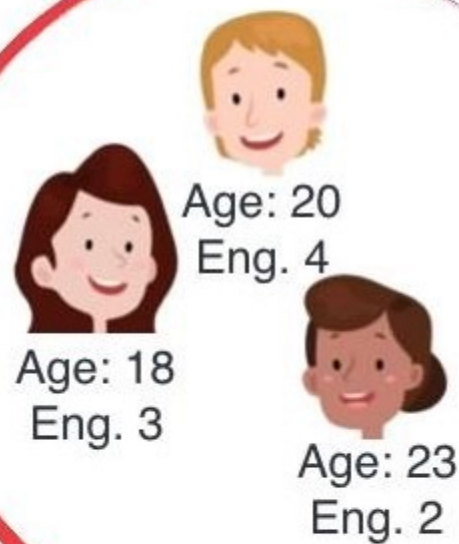
5

4

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30

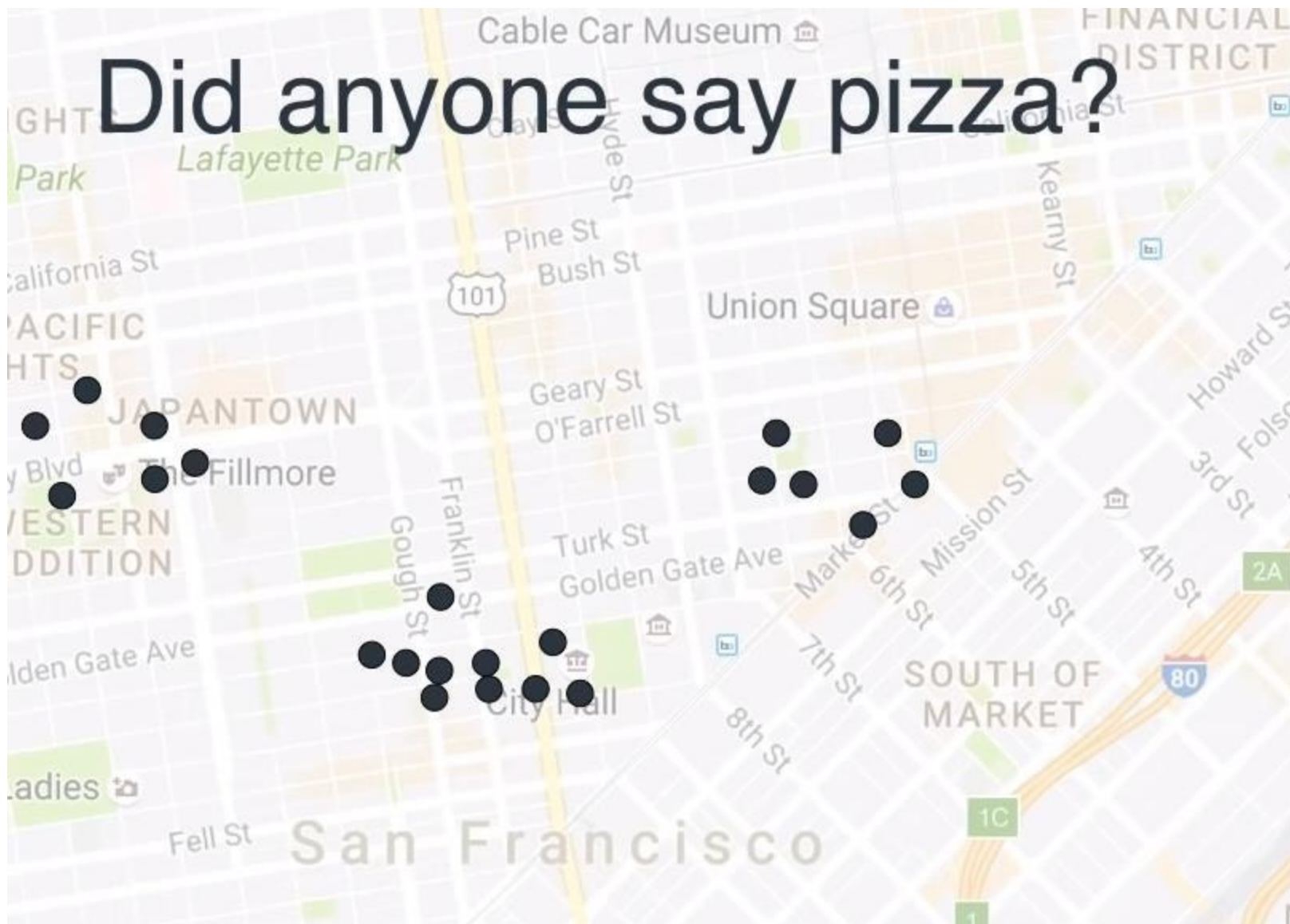
40

50

age



# Did anyone say pizza?



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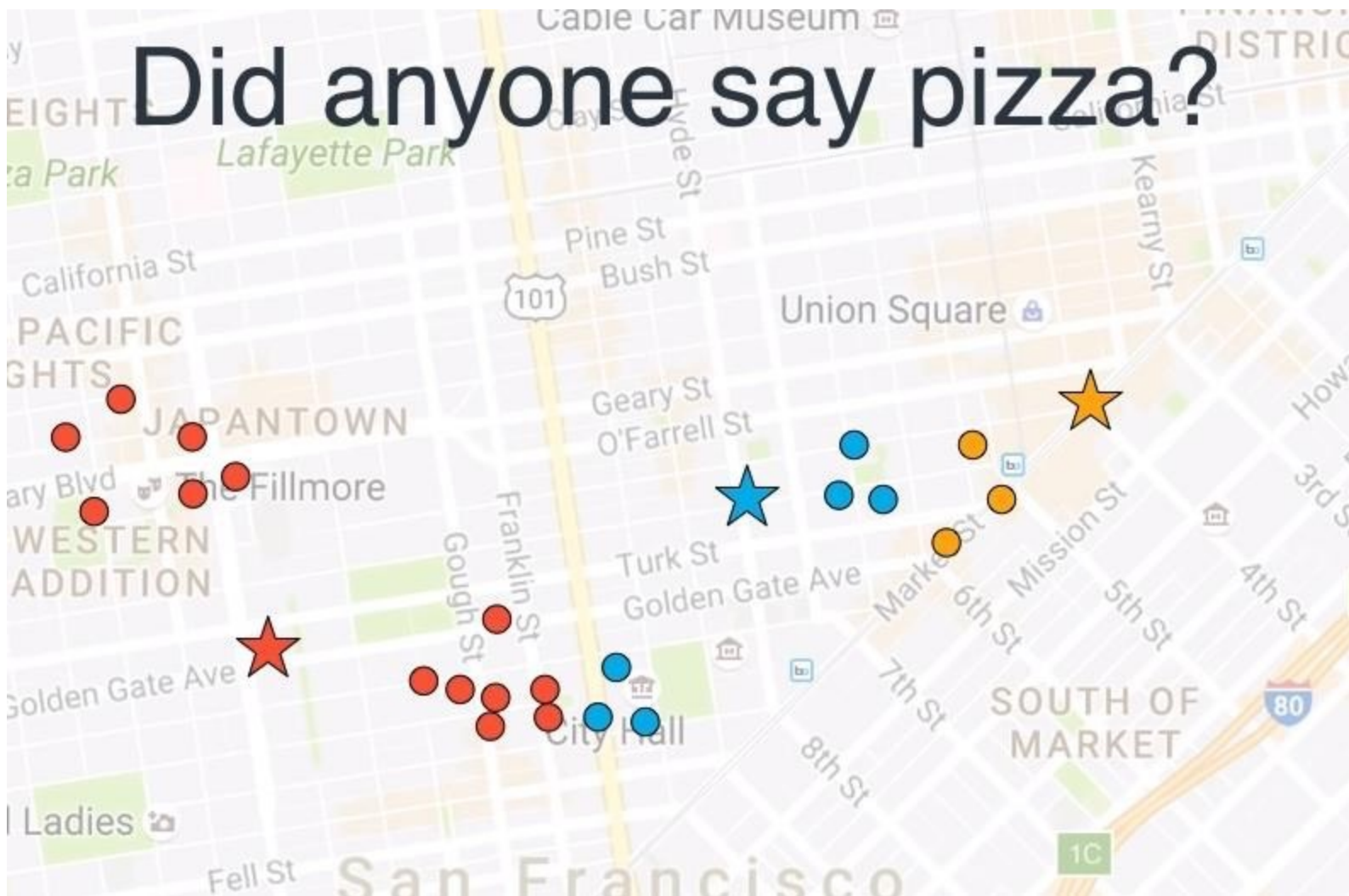


# Did anyone say pizza?

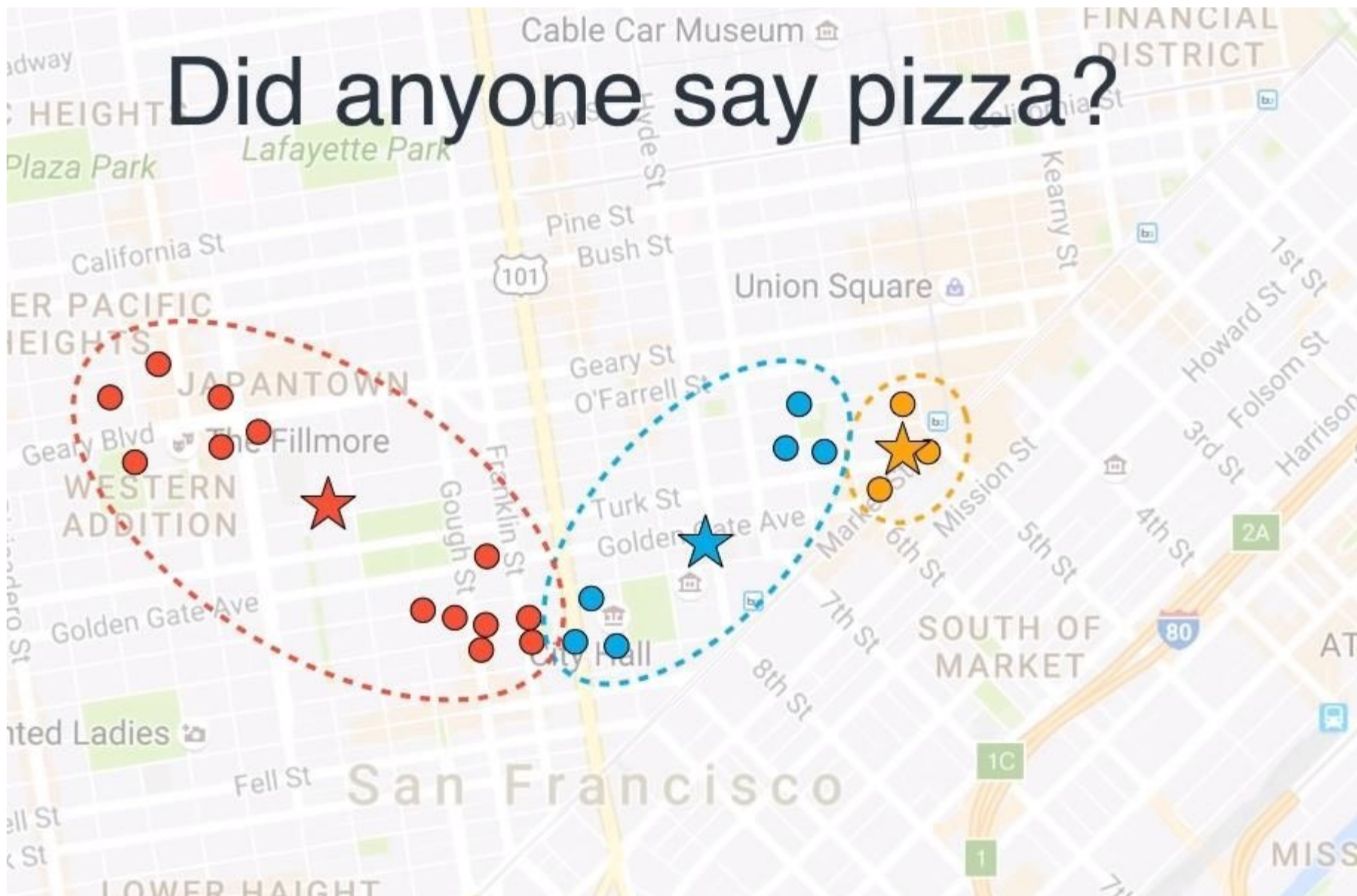




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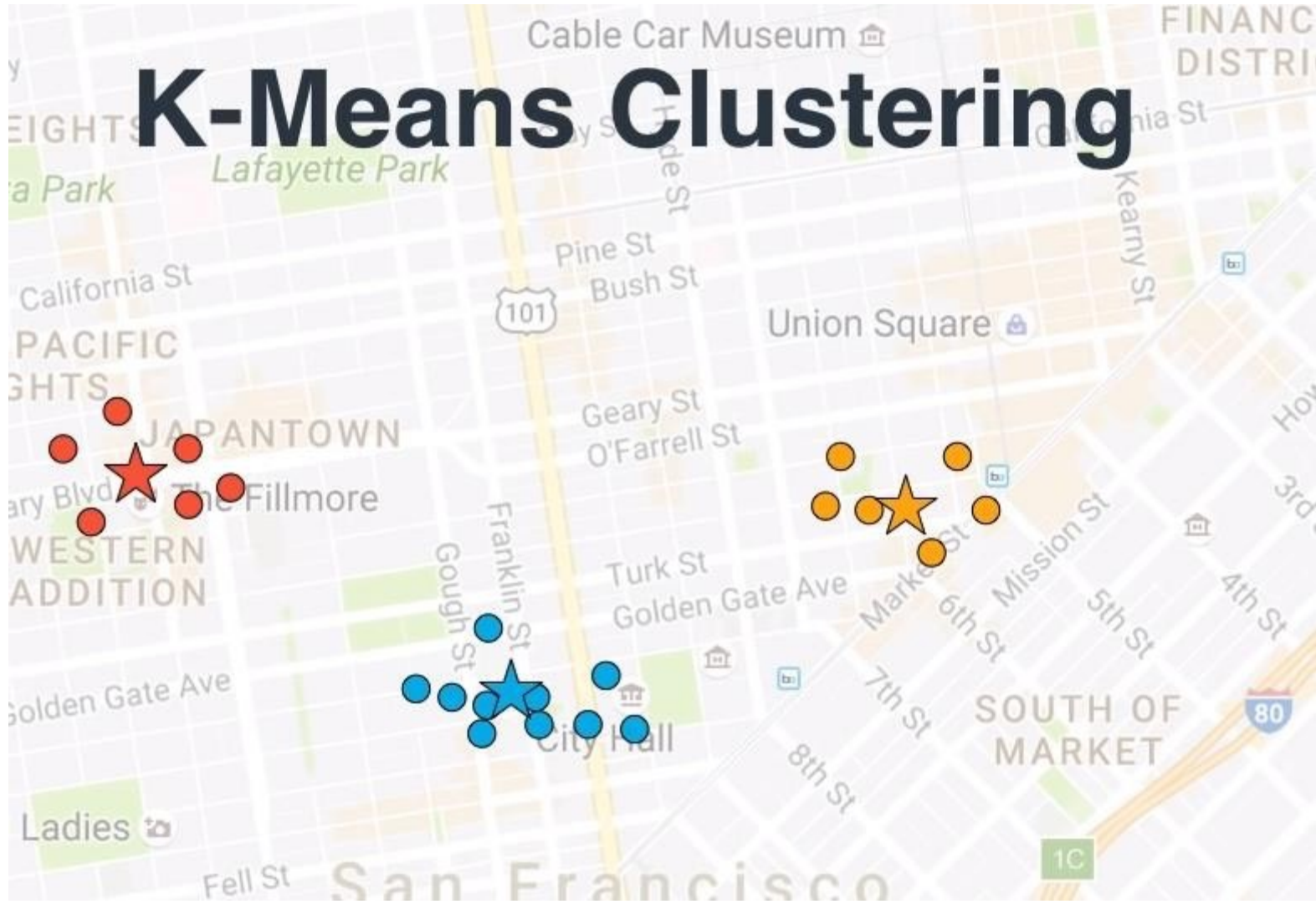




# Did anyone say pizza?



# K-Means Clustering

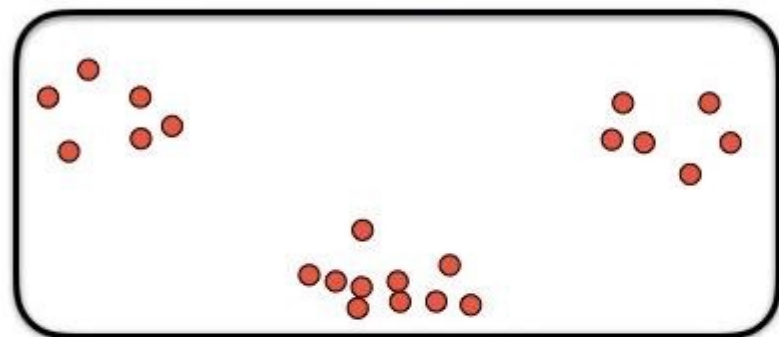


How do we know how many clusters?

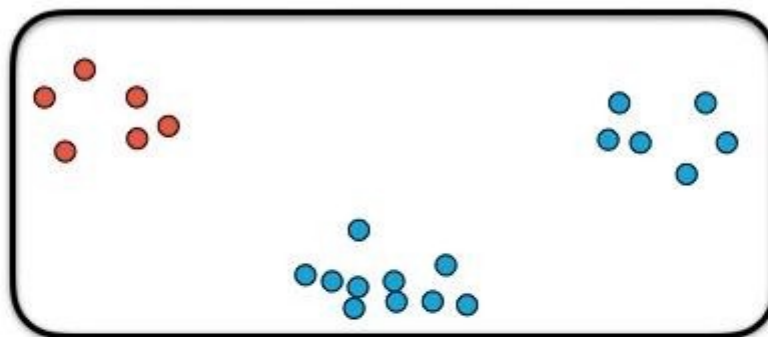
Elbow method

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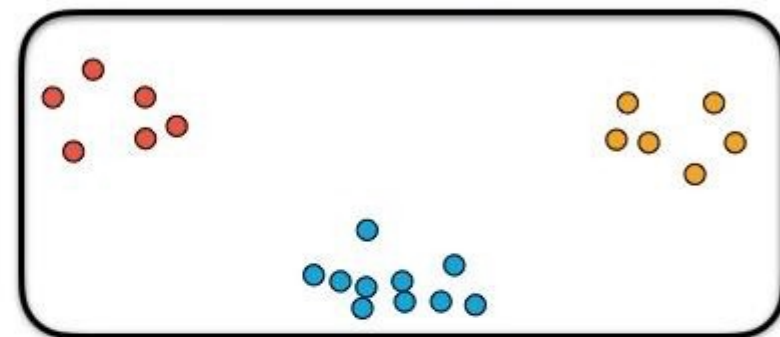
1 cluster



2 clusters



3 clusters



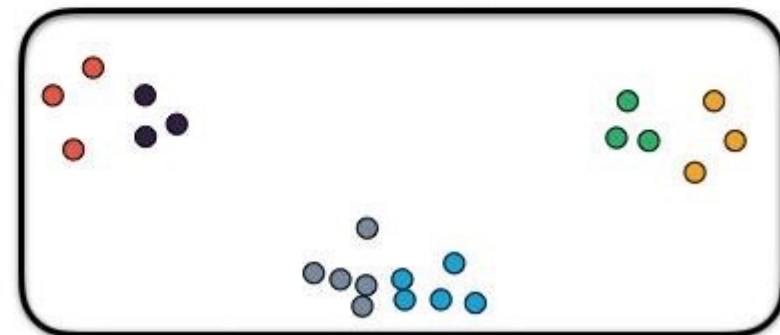
4 clusters



5 clusters

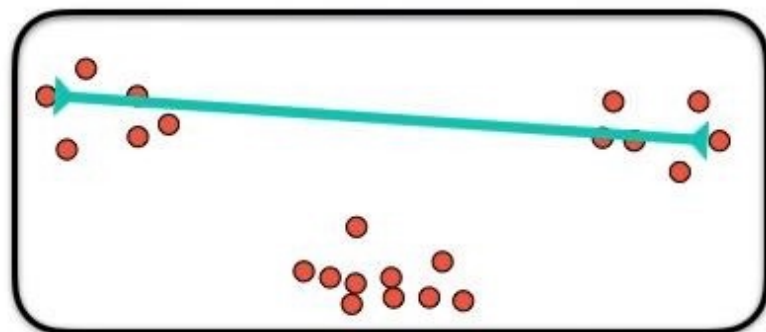


6 clusters

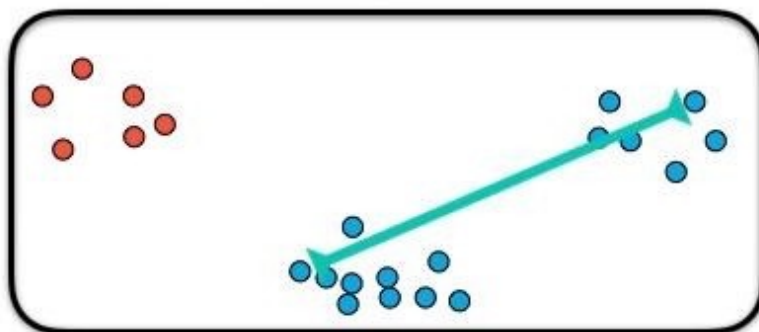


# Elbow method

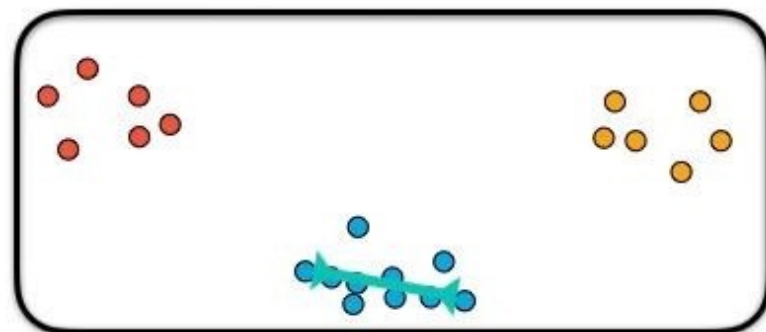
1 cluster



2 clusters



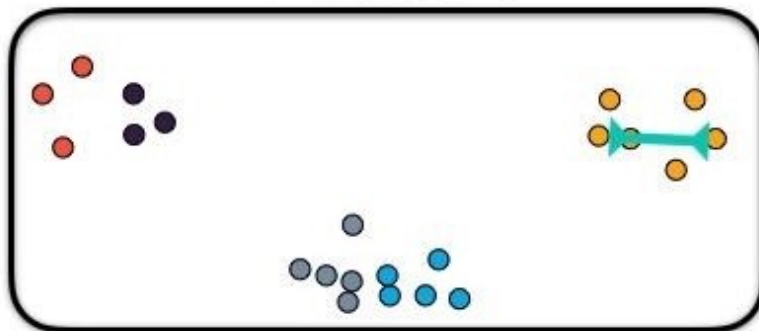
3 clusters



4 clusters



5 clusters

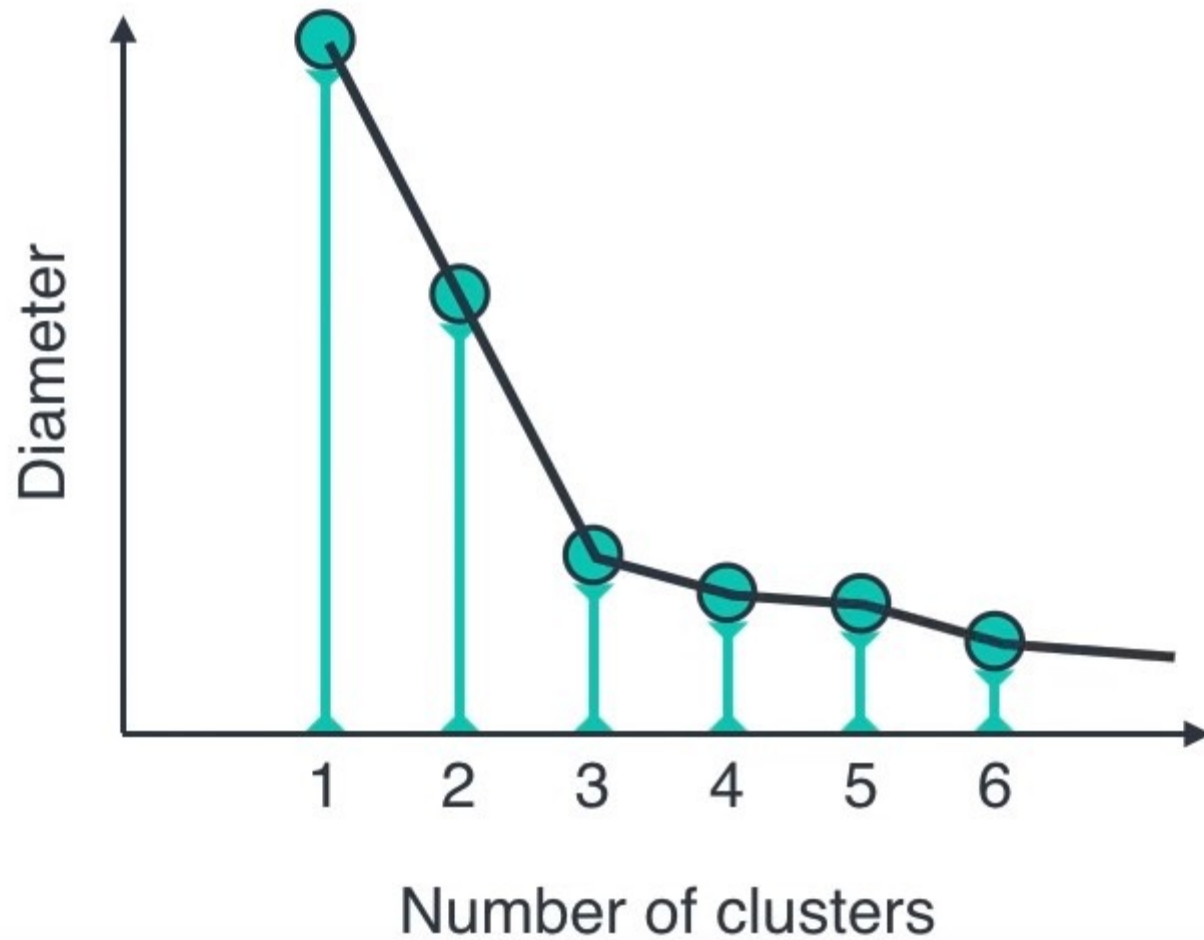


6 clusters

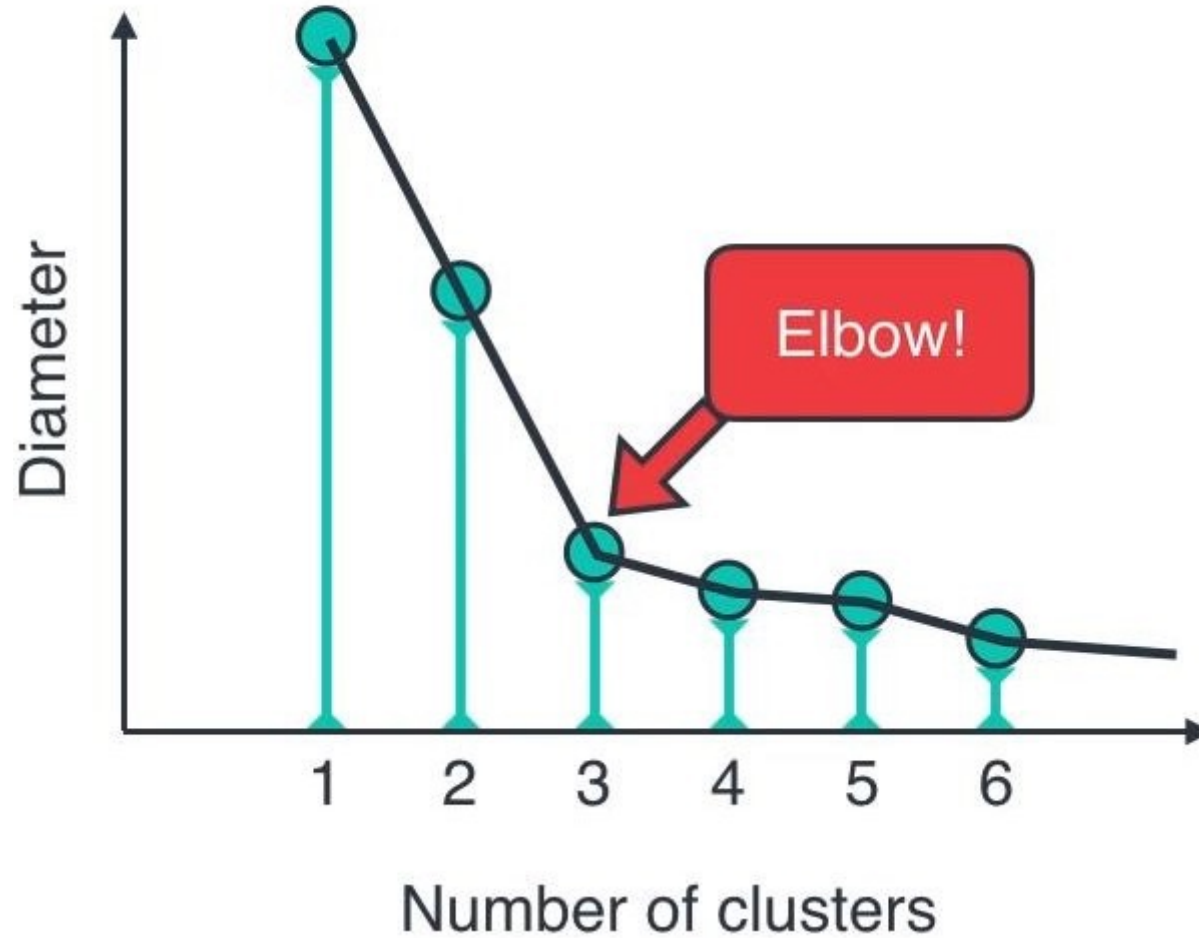




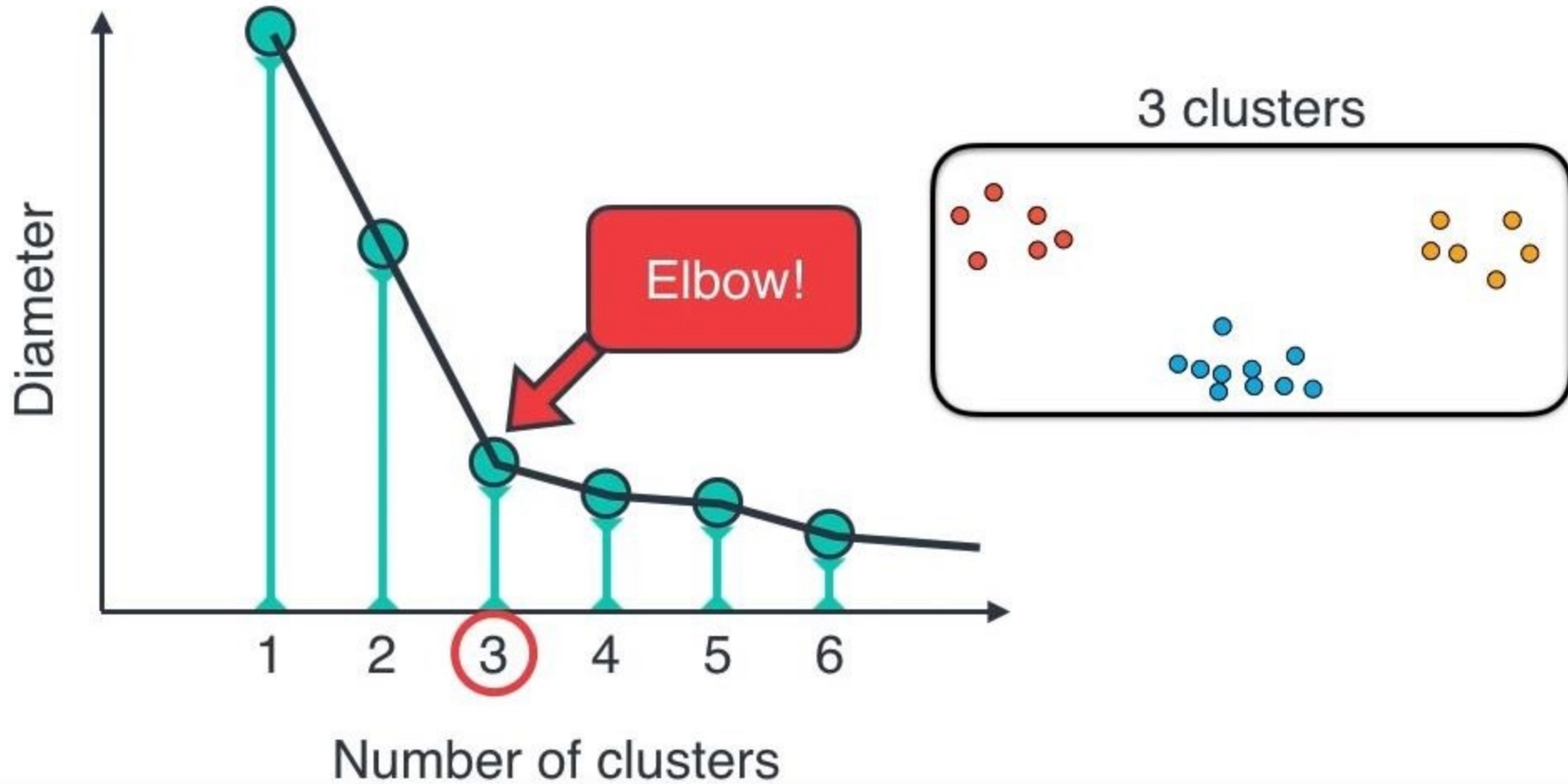
# Elbow method



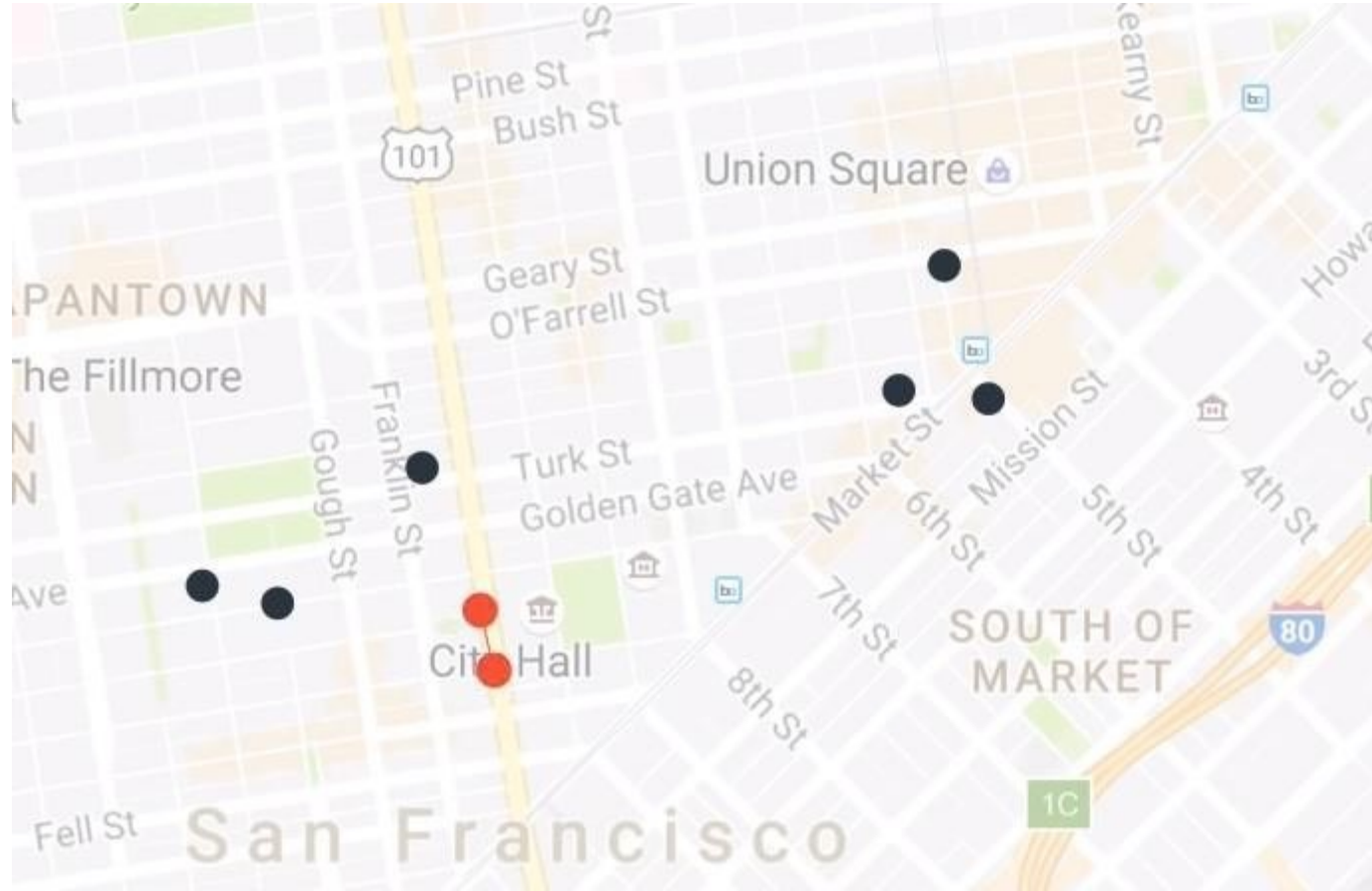
# Elbow method

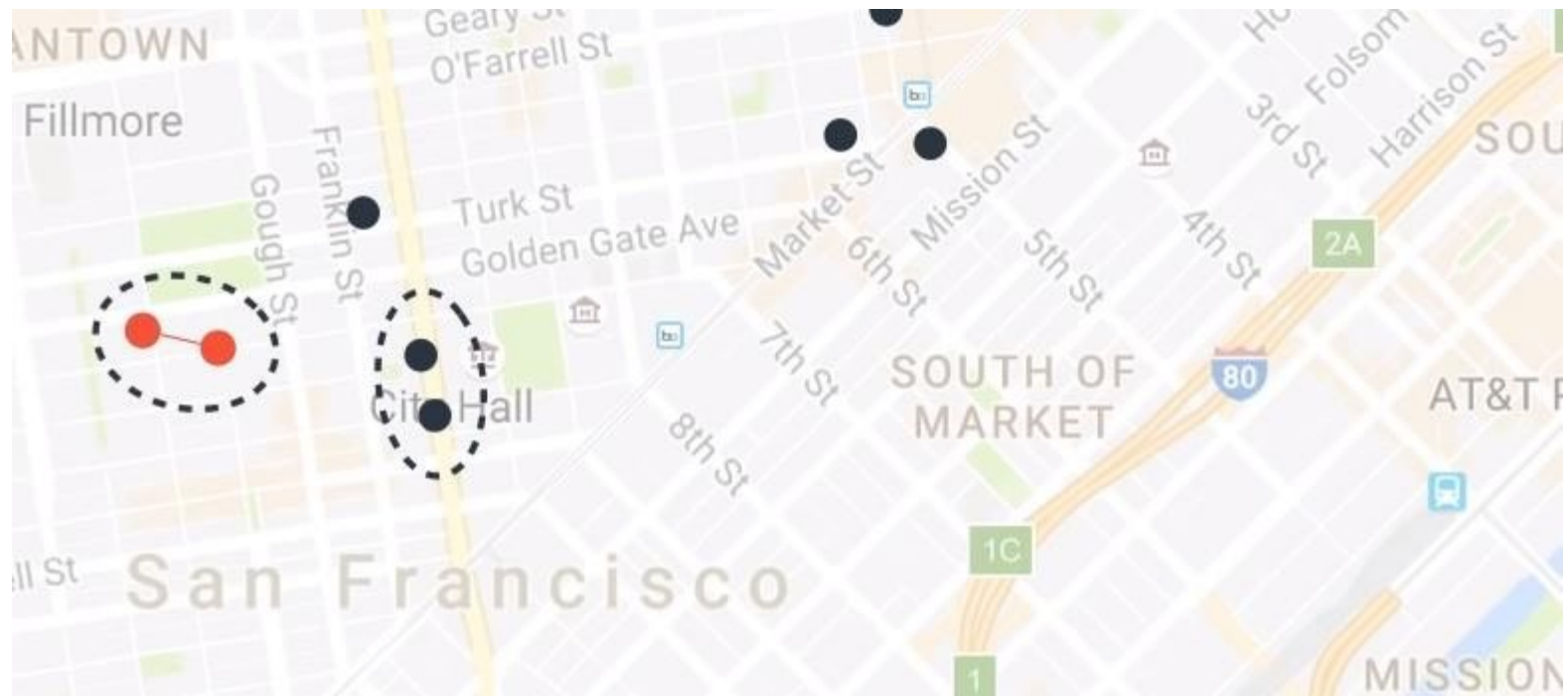


# Elbow method

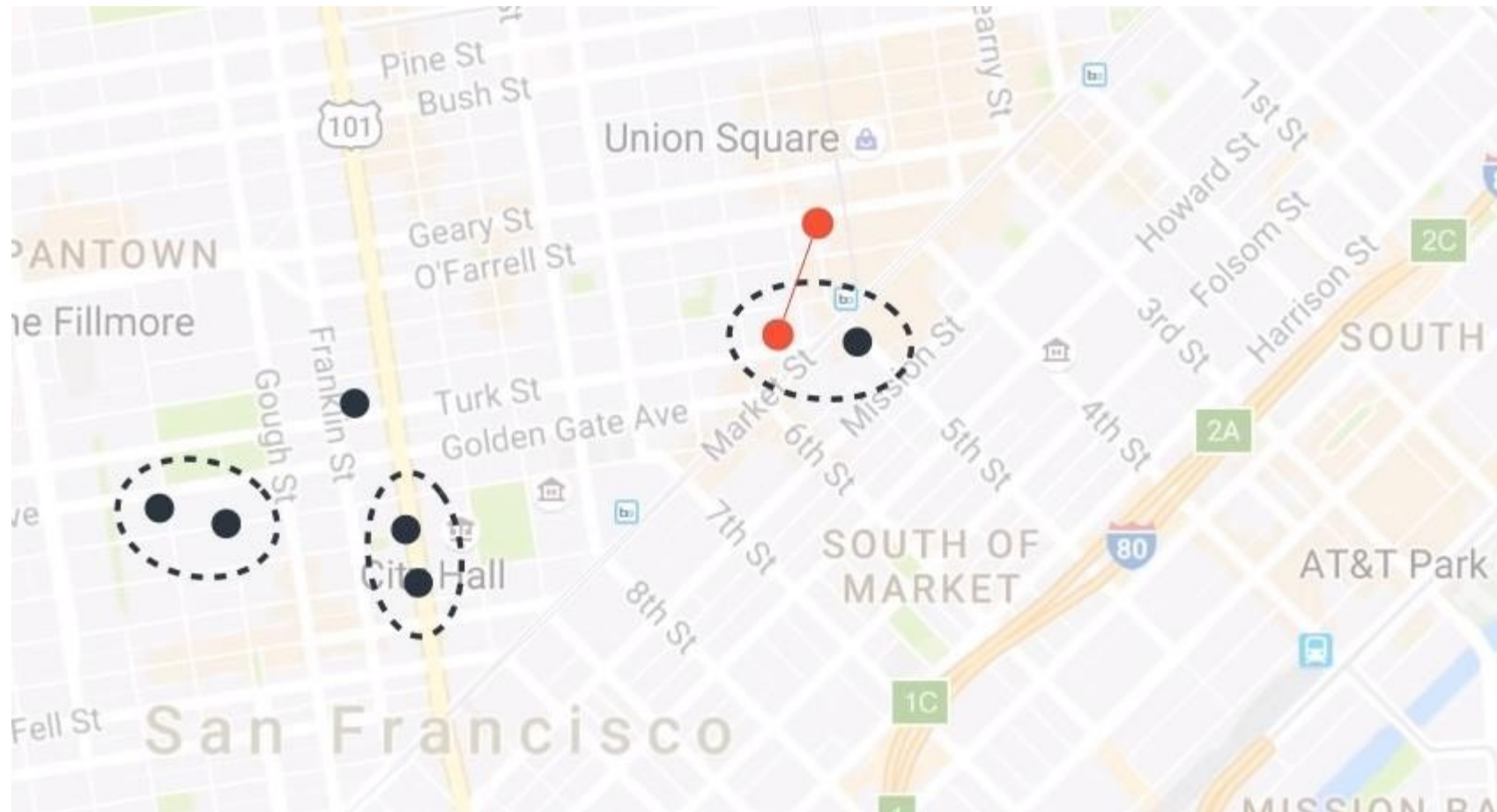


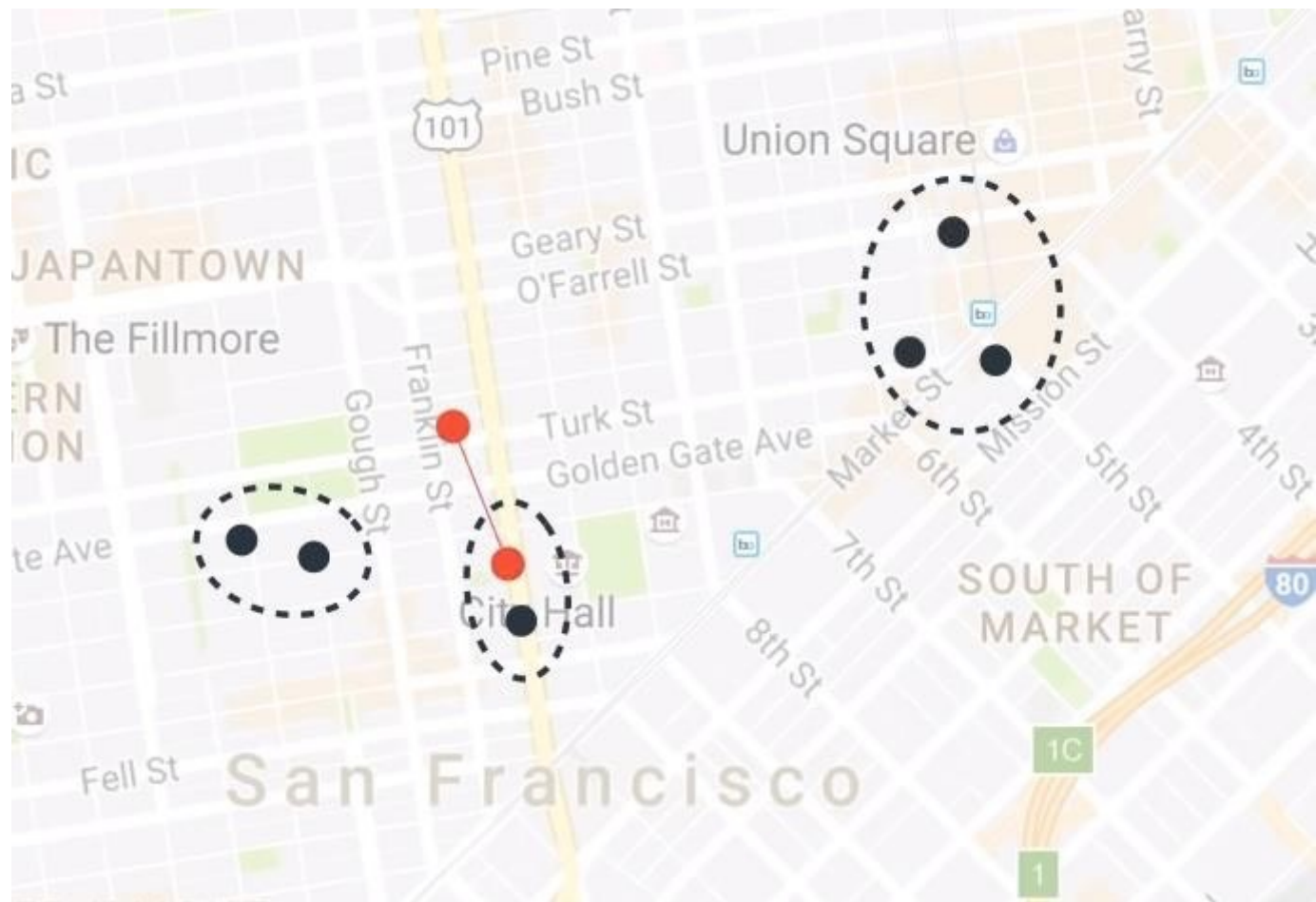
# Hierarchical clustering

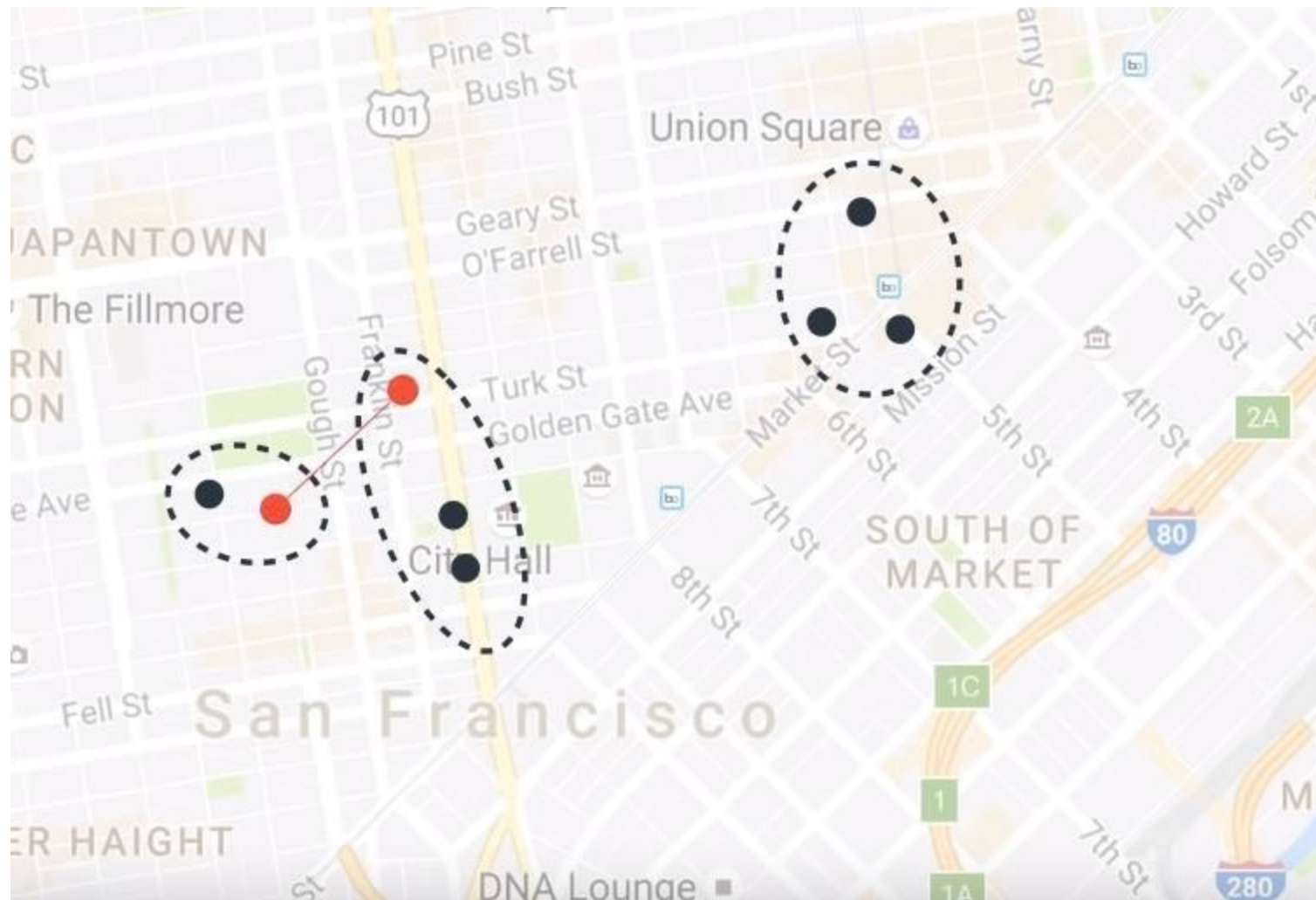
















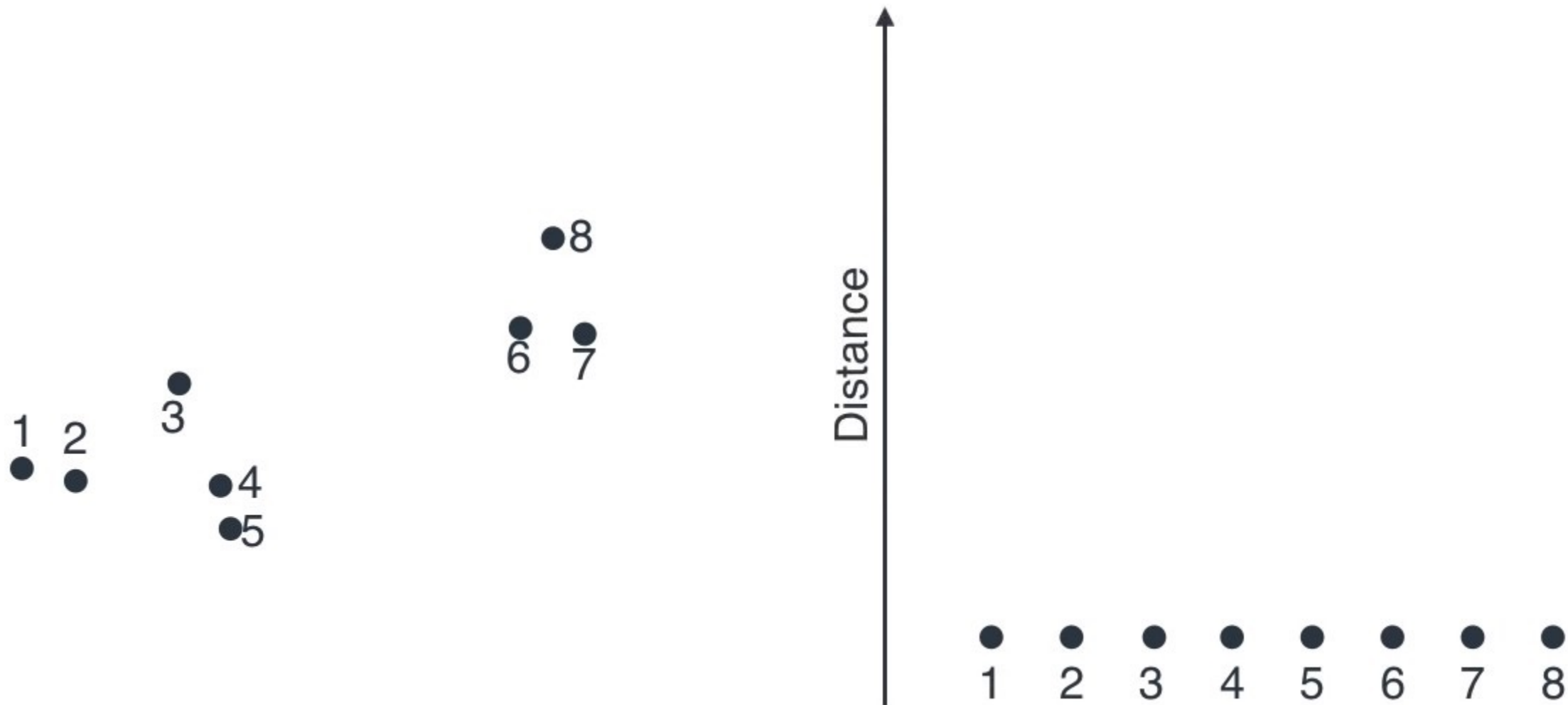
# Hierarchical Clustering



How to make a decision on number of clusters for Hierarchical clustering?



# Dendrogram

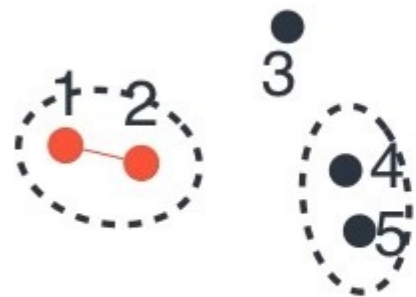


# Dendrogram

Distance



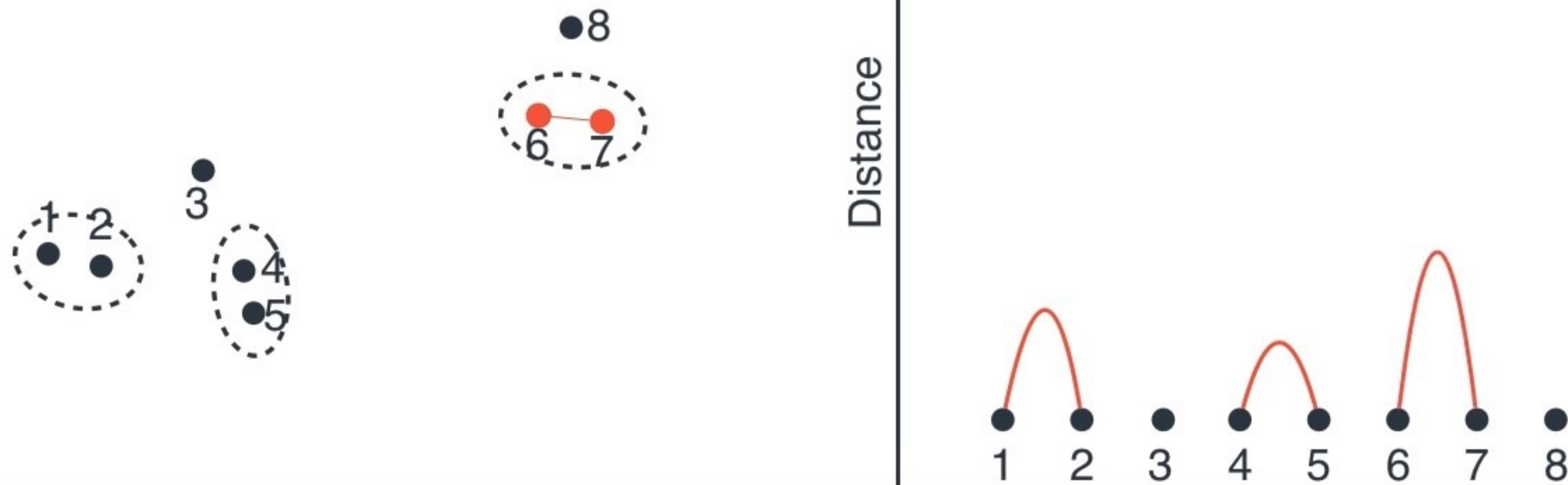
# Dendrogram



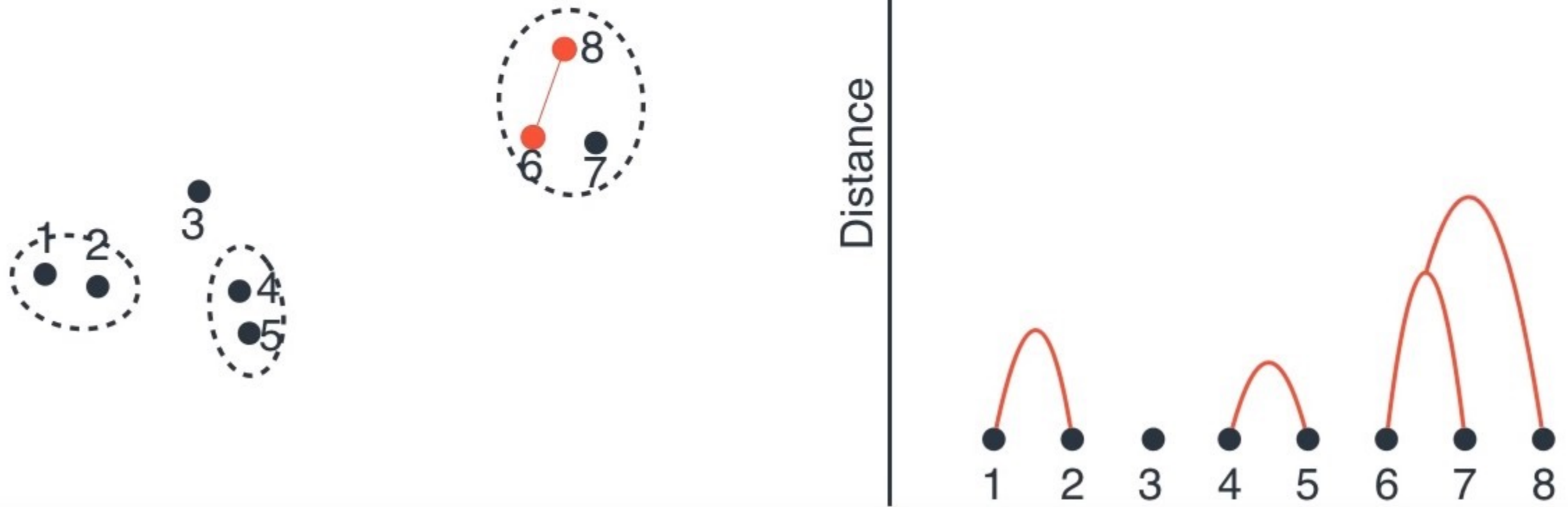
Distance



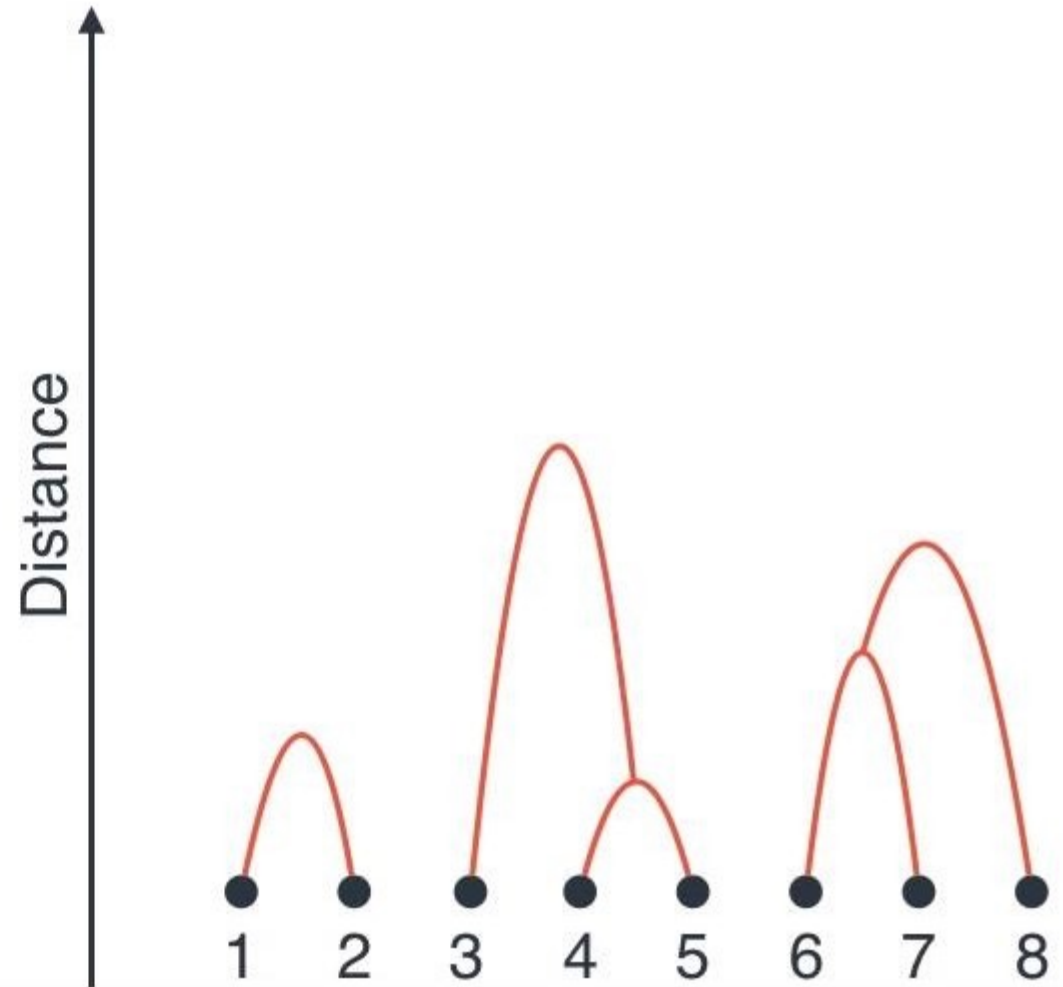
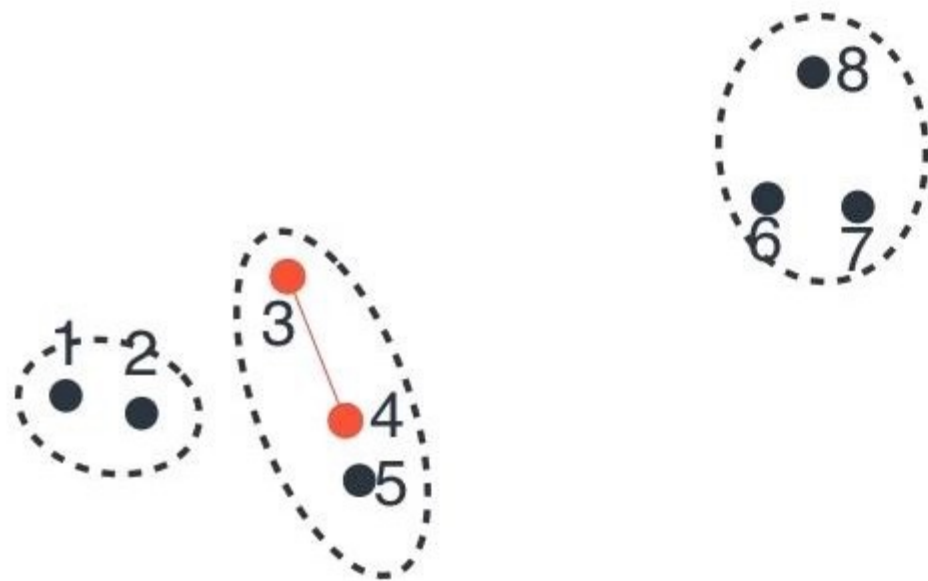
# Dendrogram



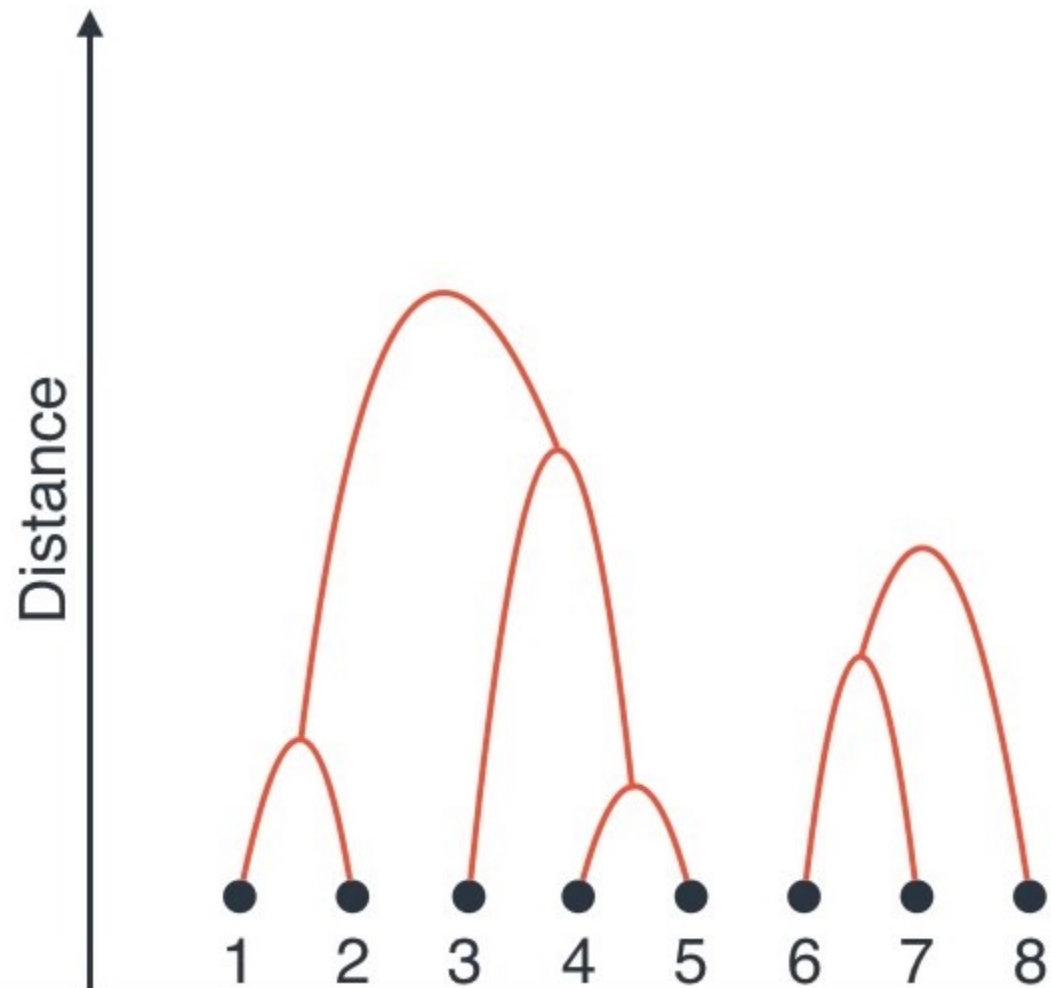
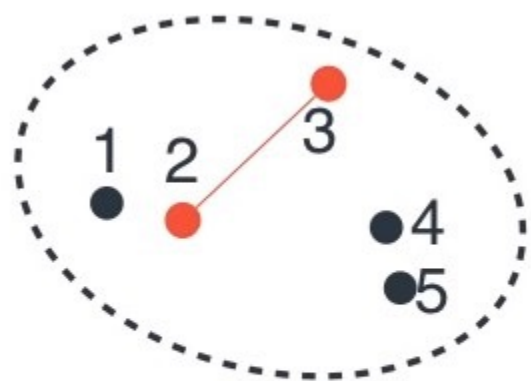
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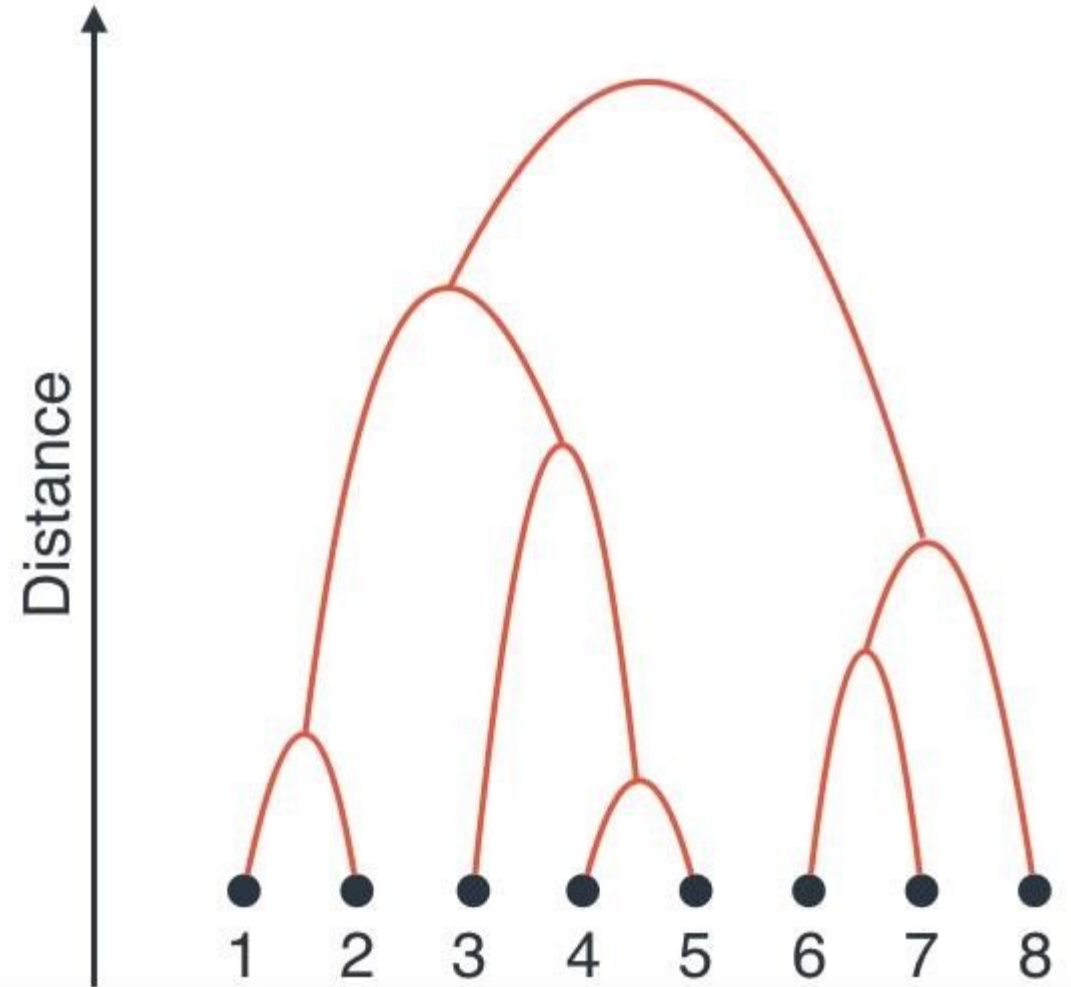
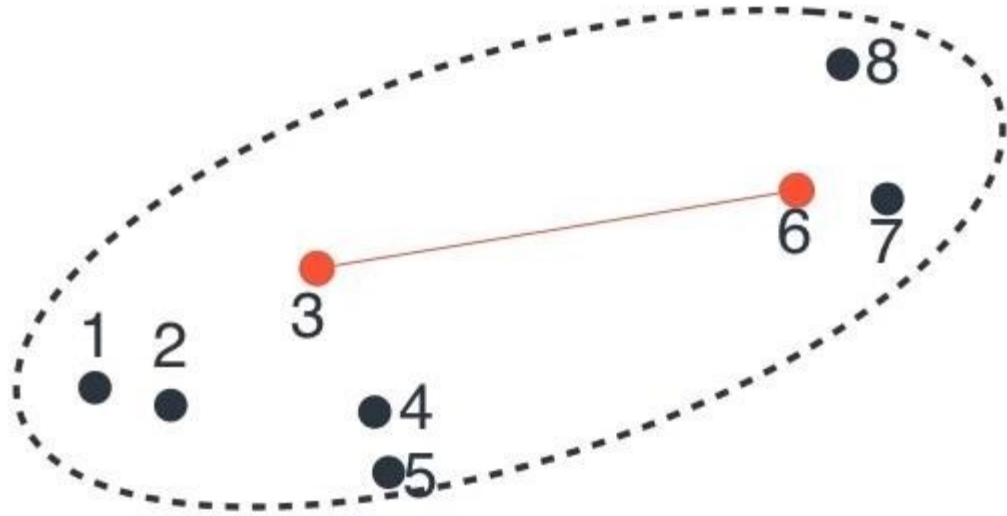


# Dendrogram

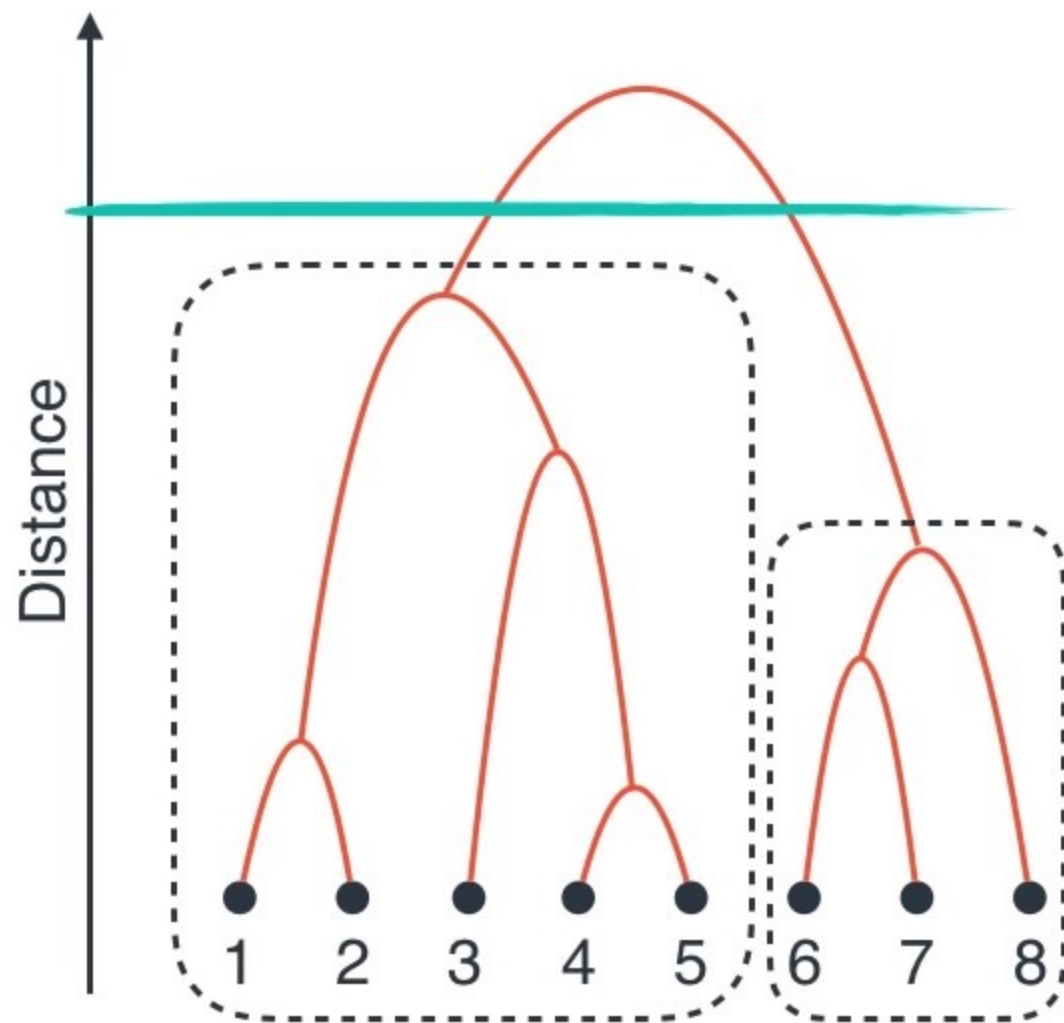
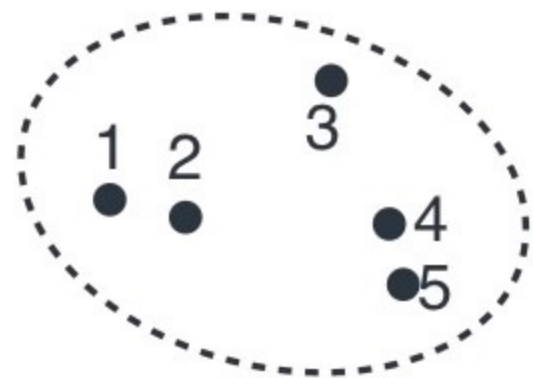




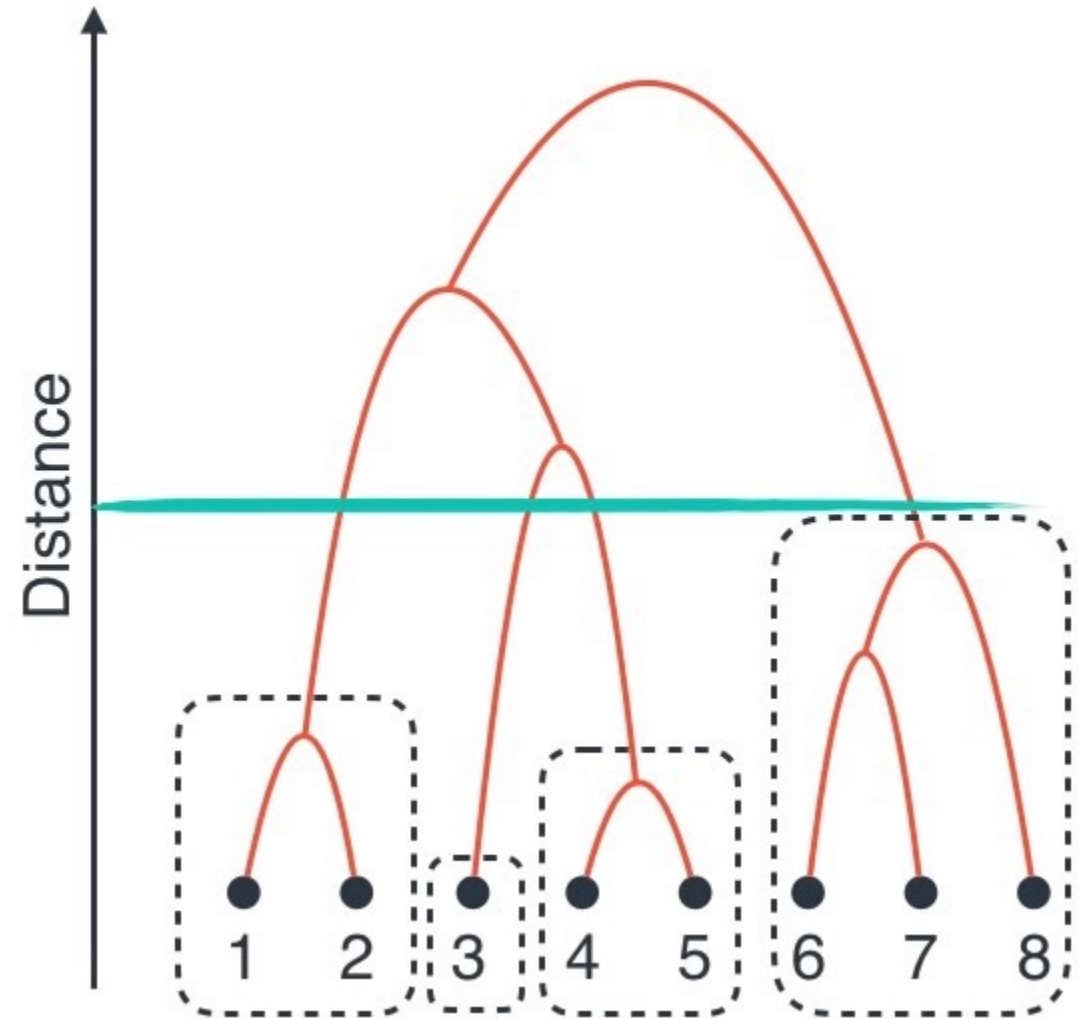
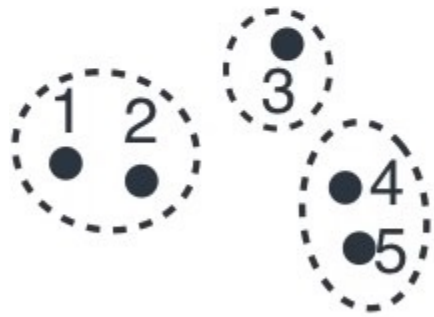
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# Dendrogram



**Credits:**

The explanation is taken from Luis Serrano on Clustering