K-means vs Bisecting K-means

Sotiris Ftiakas: 3076

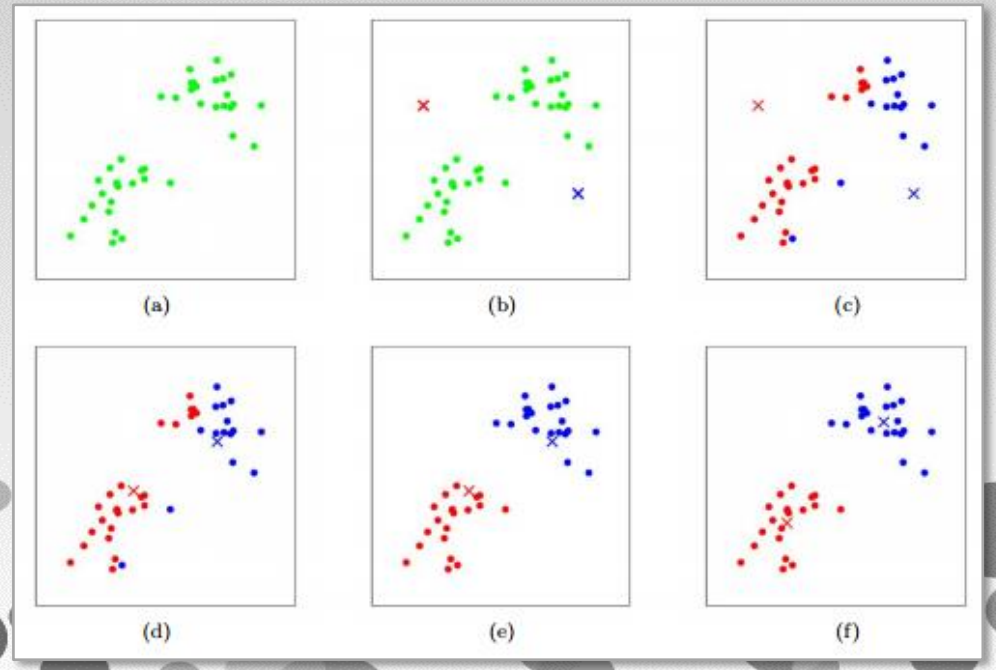
Grigoris Barmpas: 3108

K-means

Agglomerative – Bottom Up

Computationally expensive

Clusters of unbalanced size

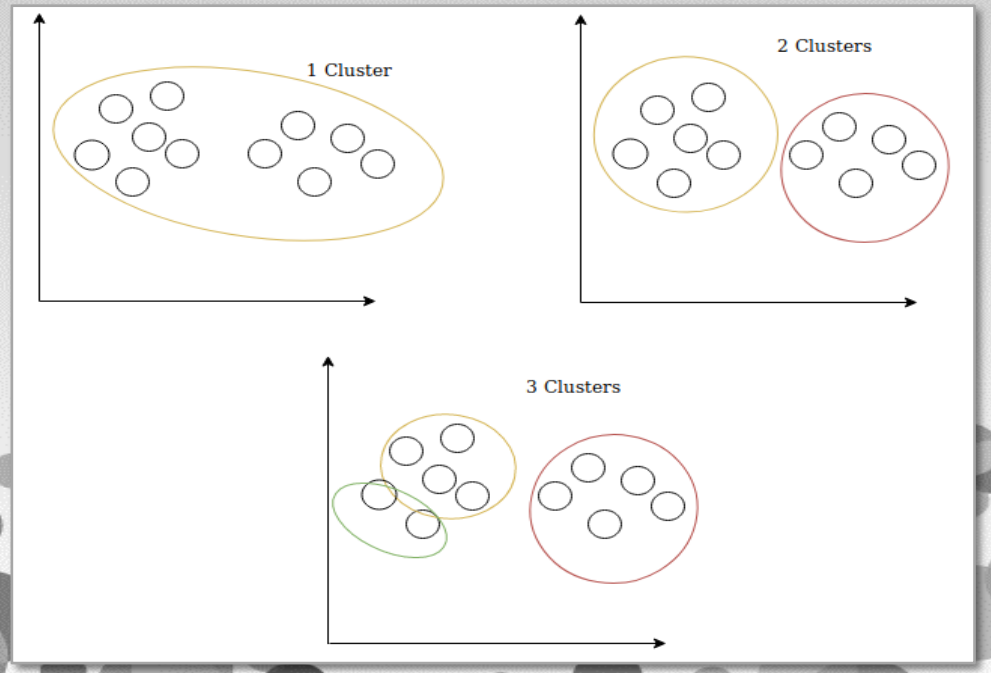


Bisecting K-means

Divisive – Top Down

Computationally faster

Clusters of similar size



Datasets

1) 2-D Gaussian Data

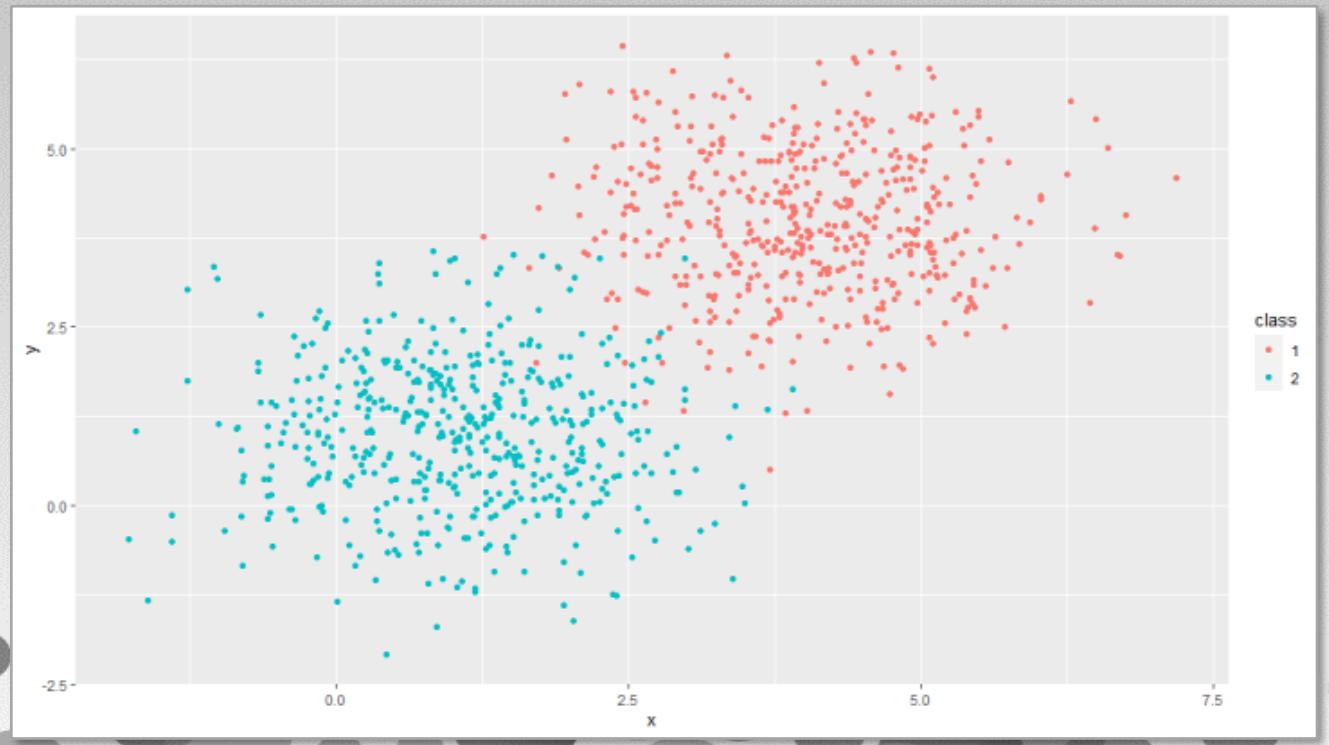
2) Japan

3) World

4) 2-D MNIST Dataset

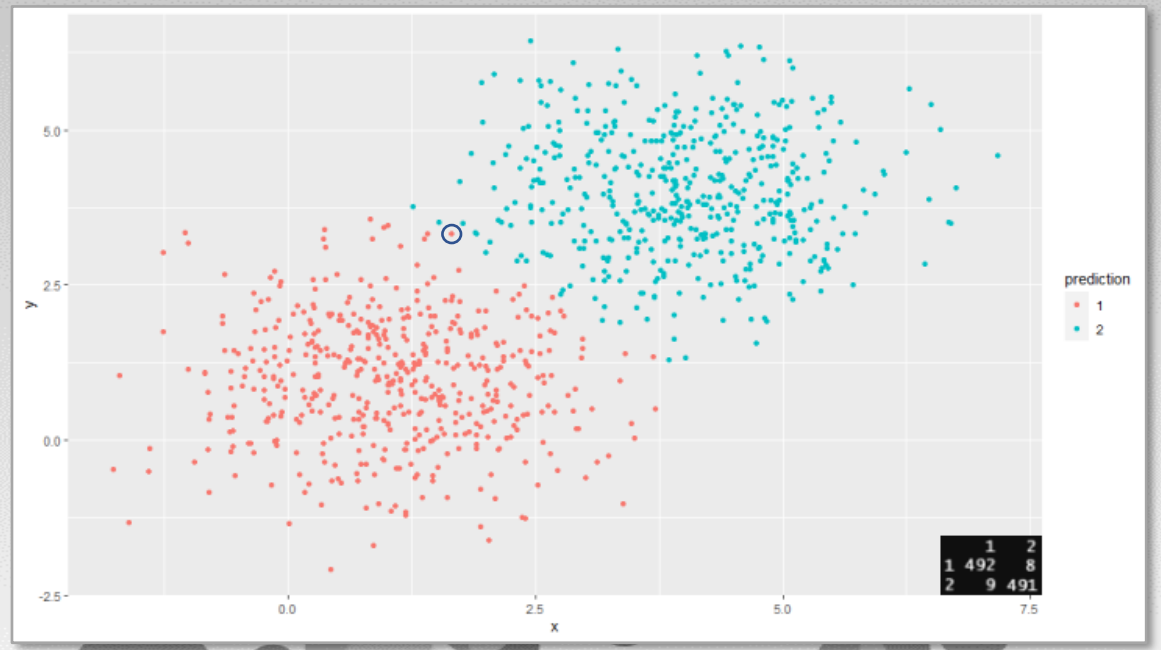
2-D Gaussian Data – 2 Centers

Representation

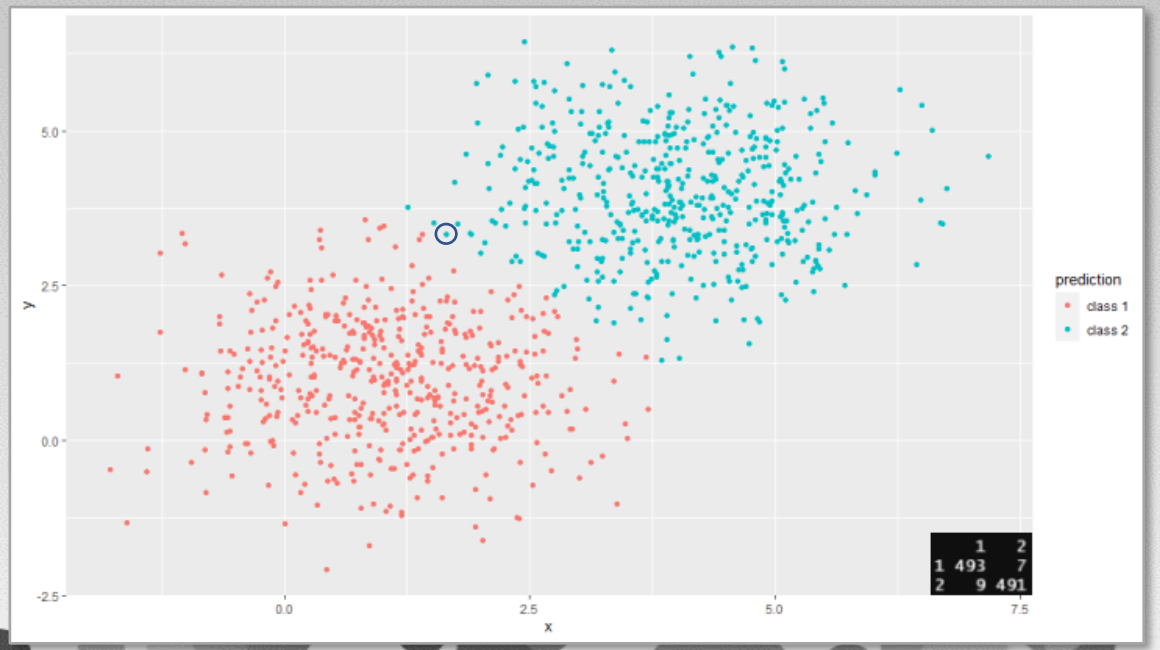


2-D Gaussian Data – 2 Centers

K-means

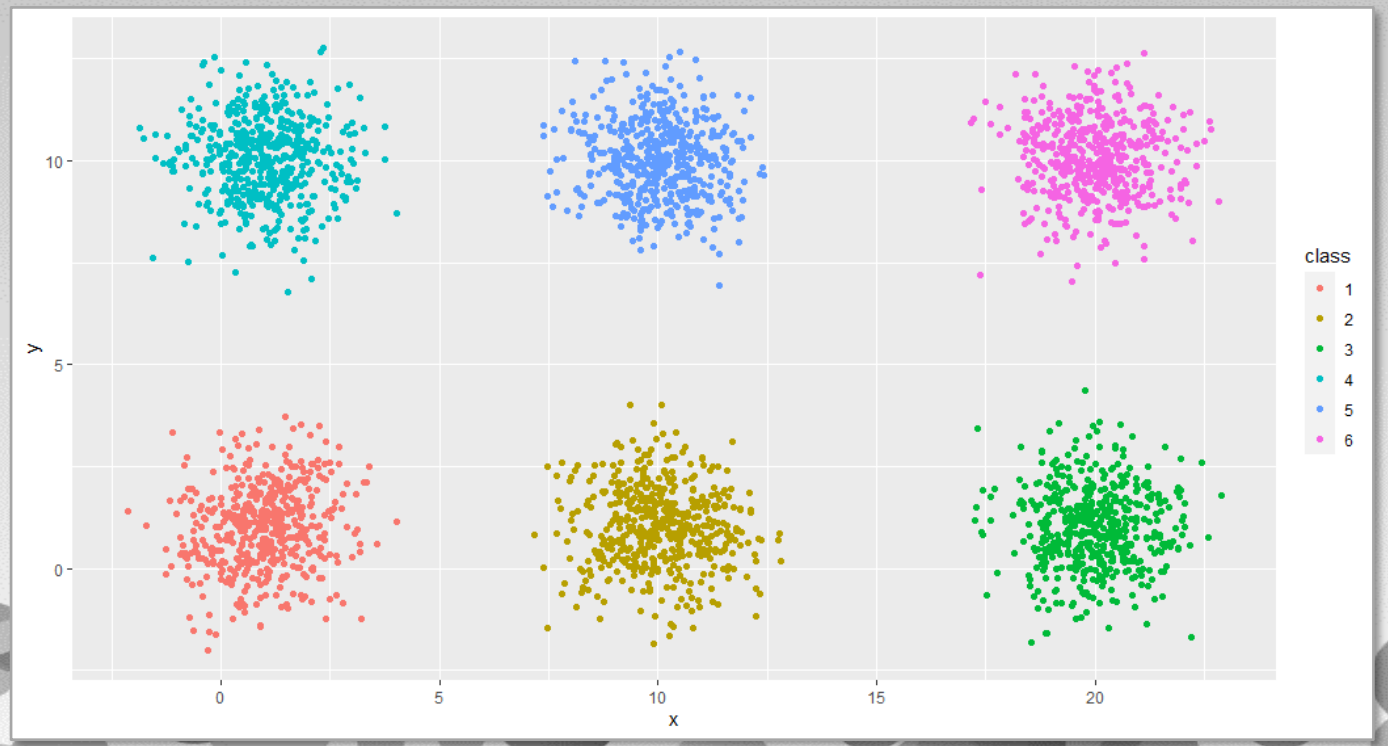


Bisecting K-means



2-D Gaussian Data – 6 Centers

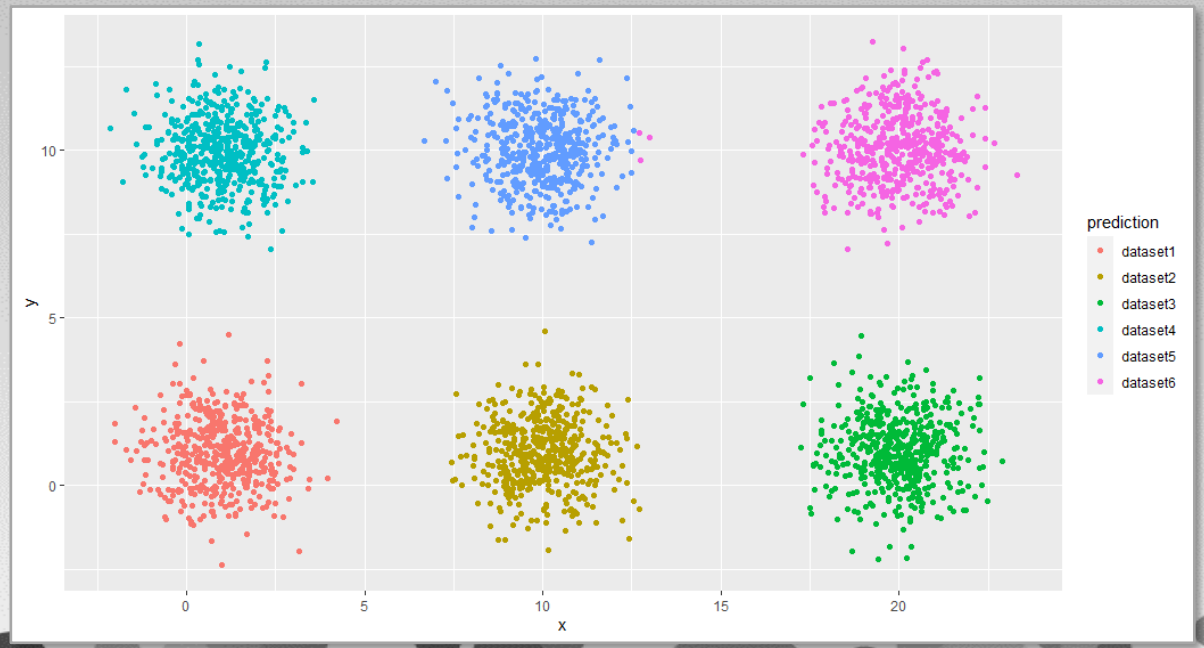
Representation



2-D Gaussian Data – 6 Centers

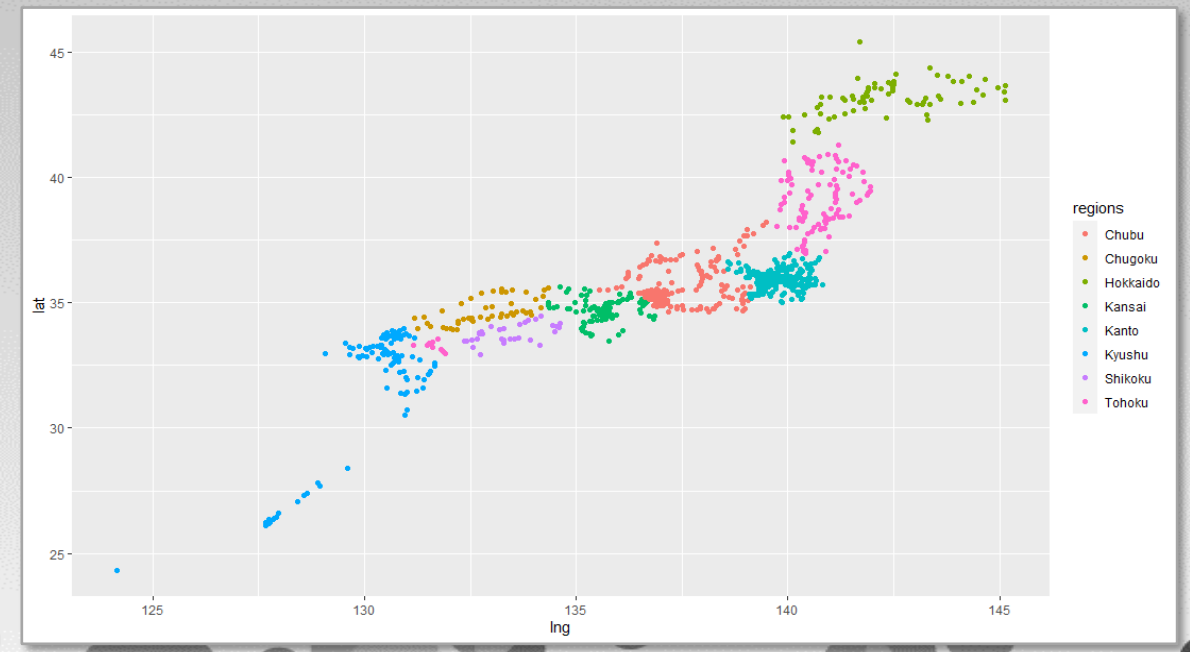
K-means

Bisecting K-means

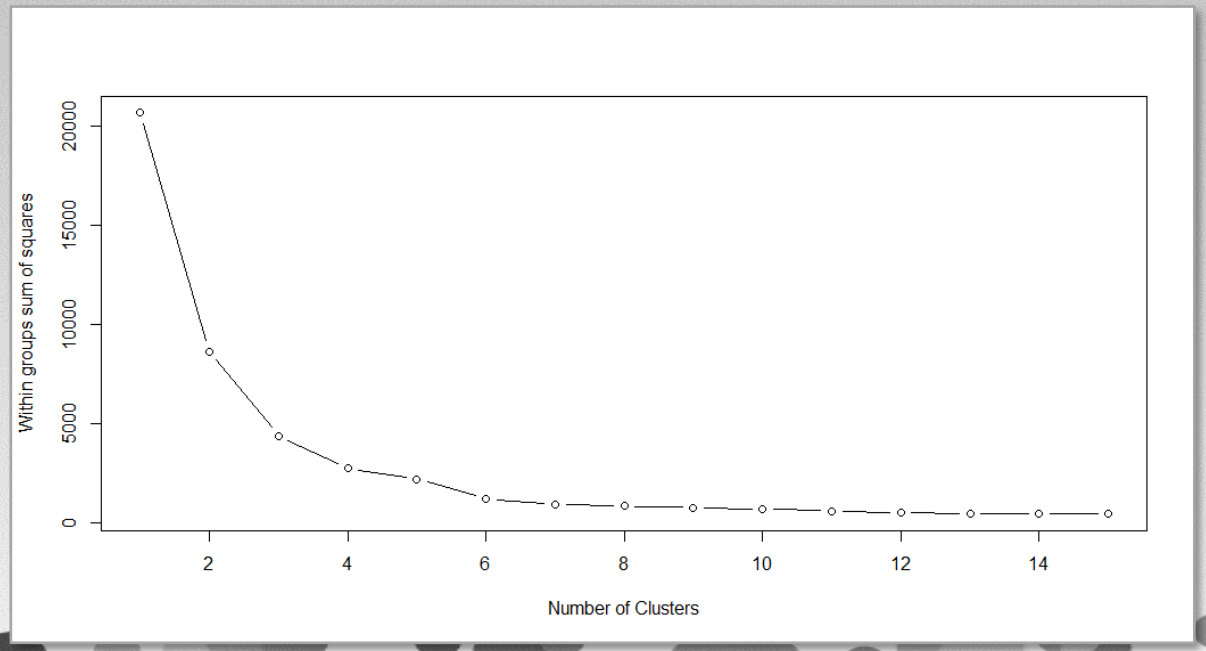


Japan

Representation

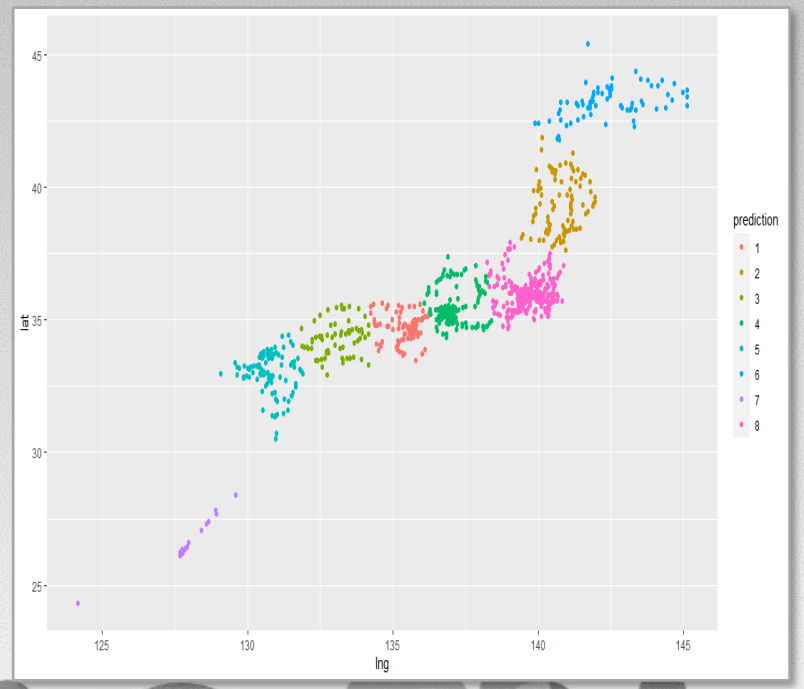


WSS Plot

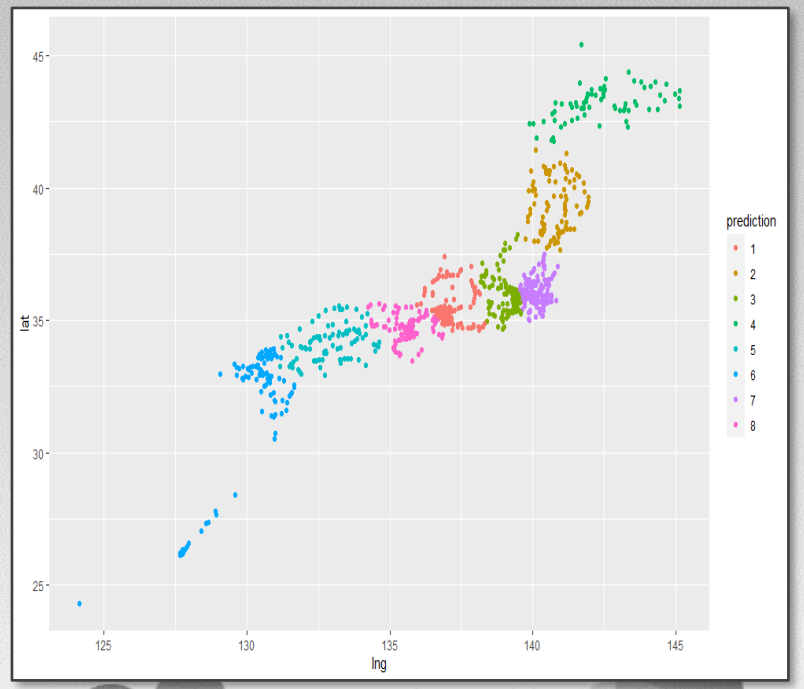


Japan

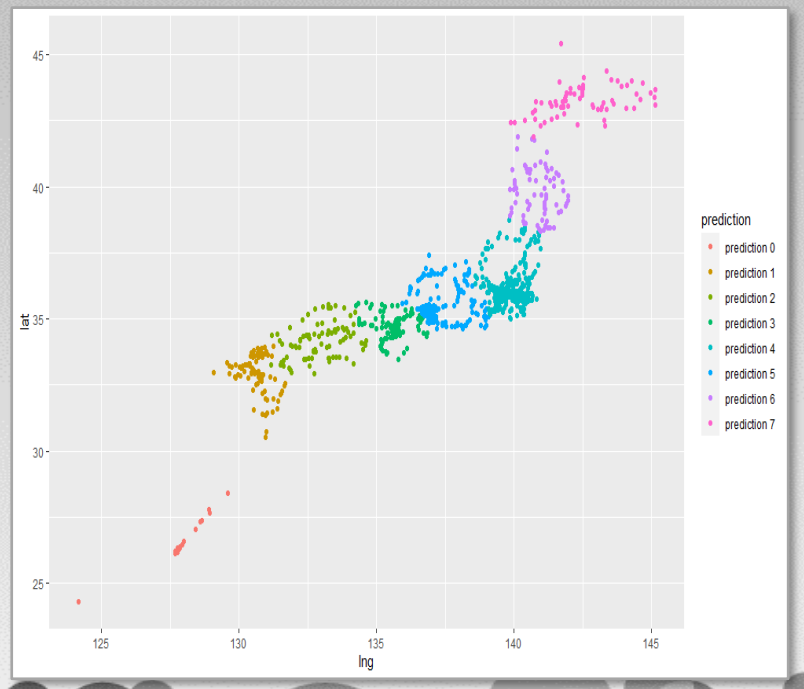
K-means (8 clusters)



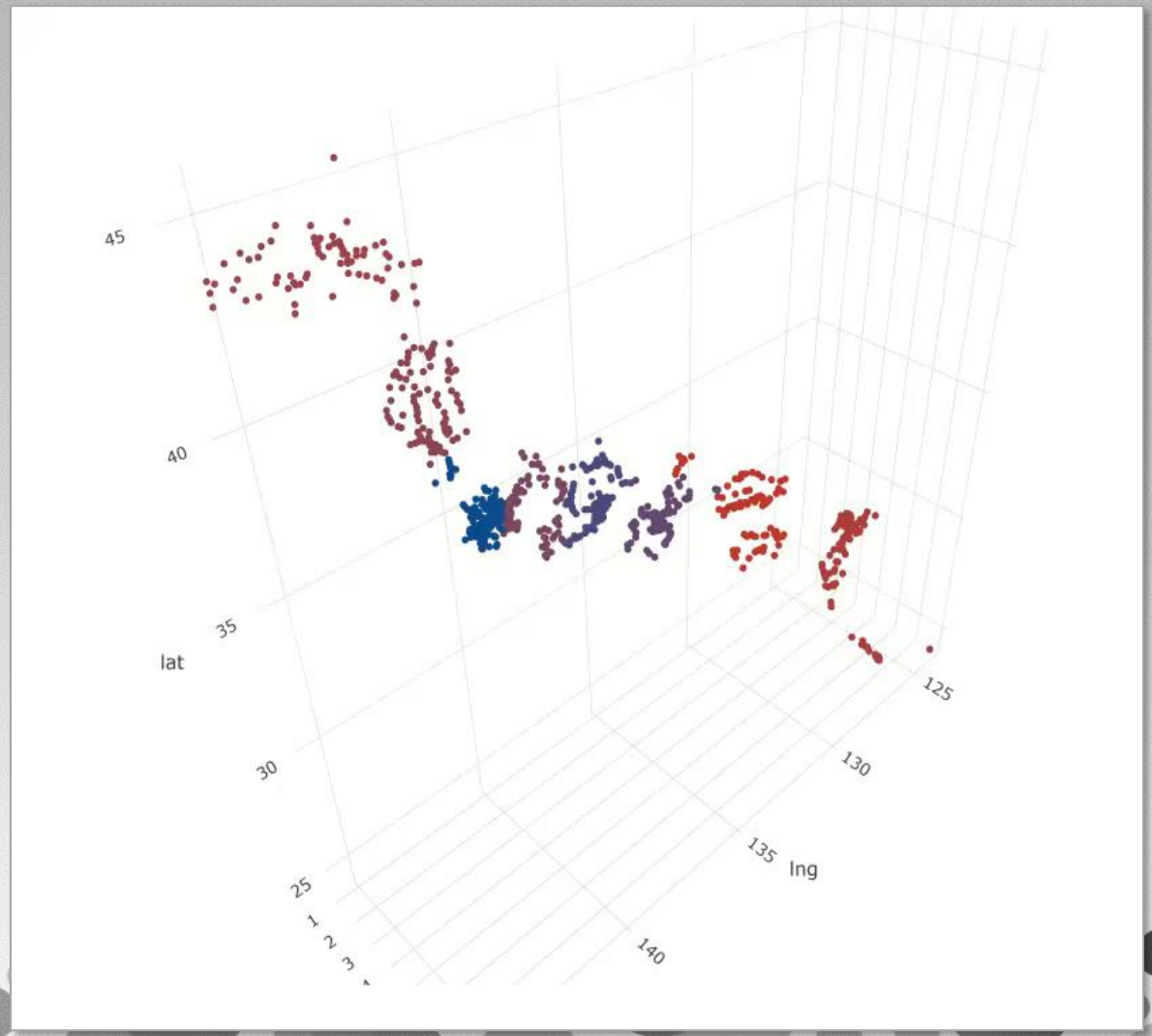
Representation



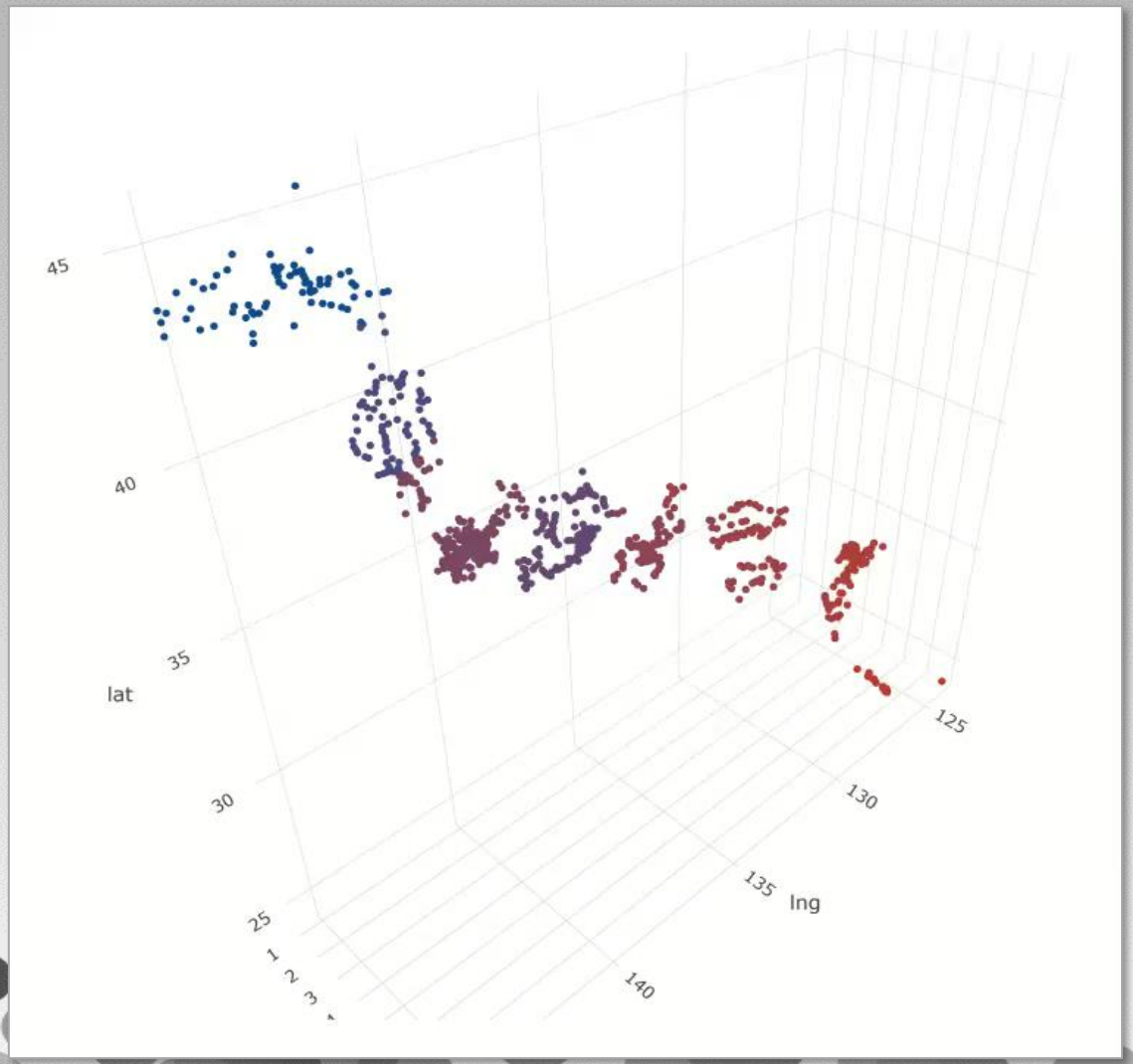
Bisecting K-means (8 clusters)



K-Means 3-D

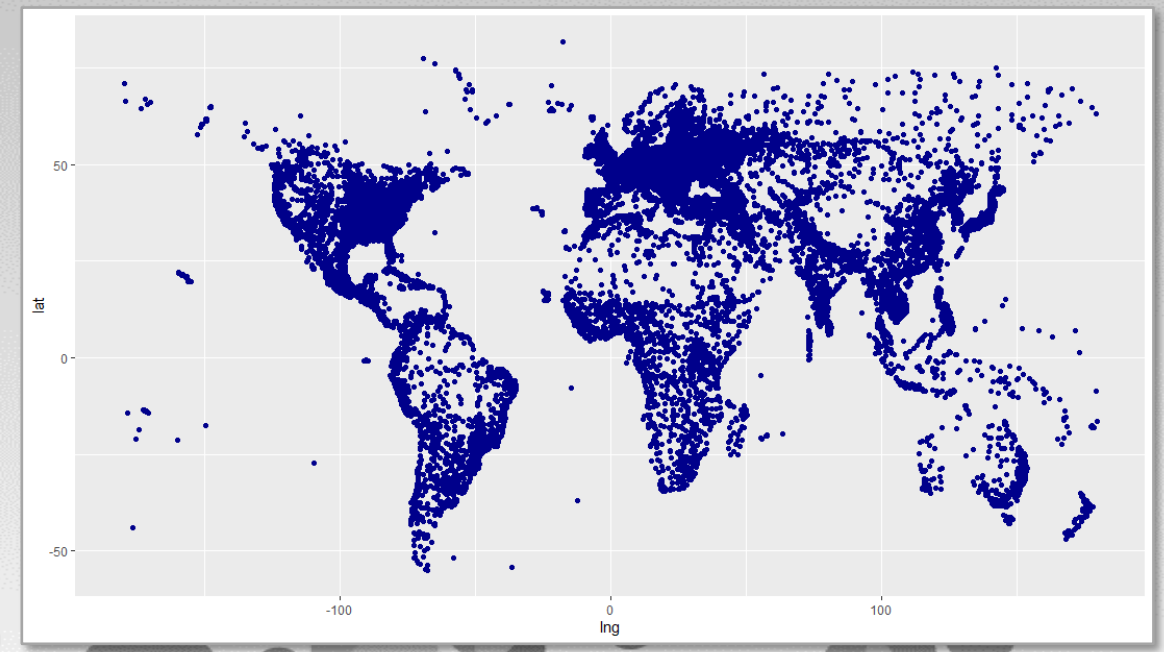


Bisecting K-Means 3-D

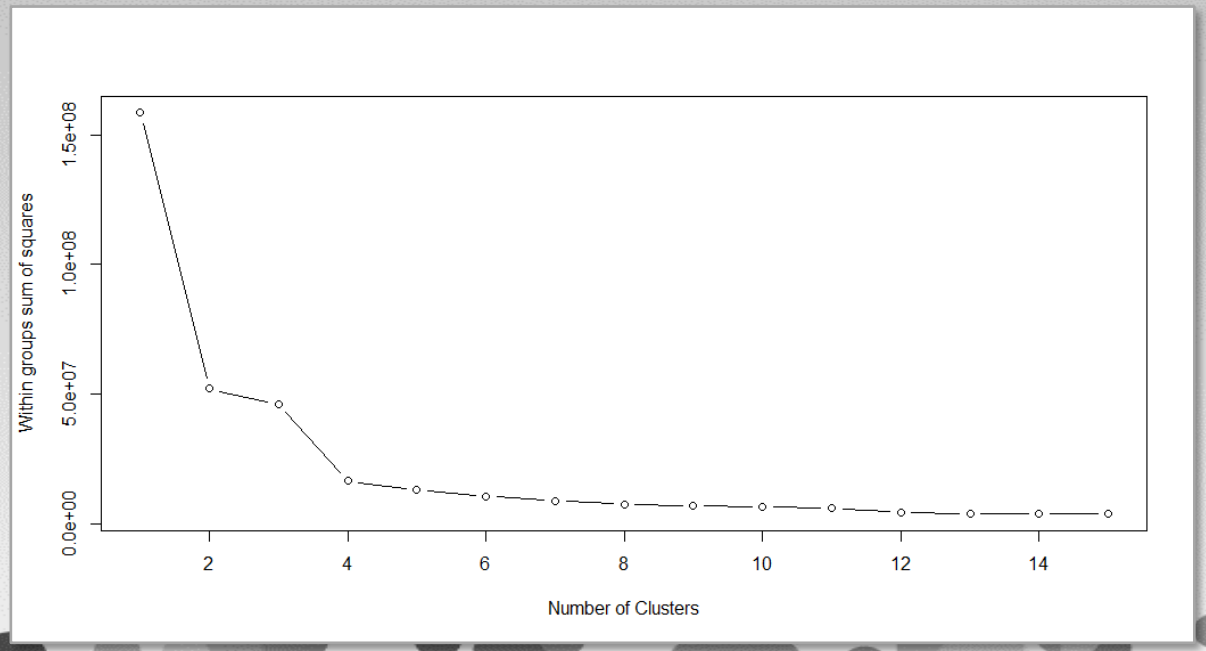


World

Representation

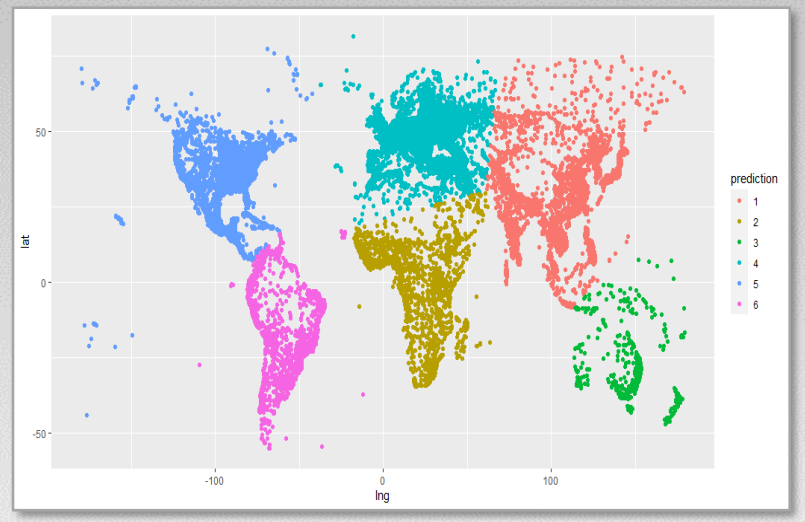


WSS Plot

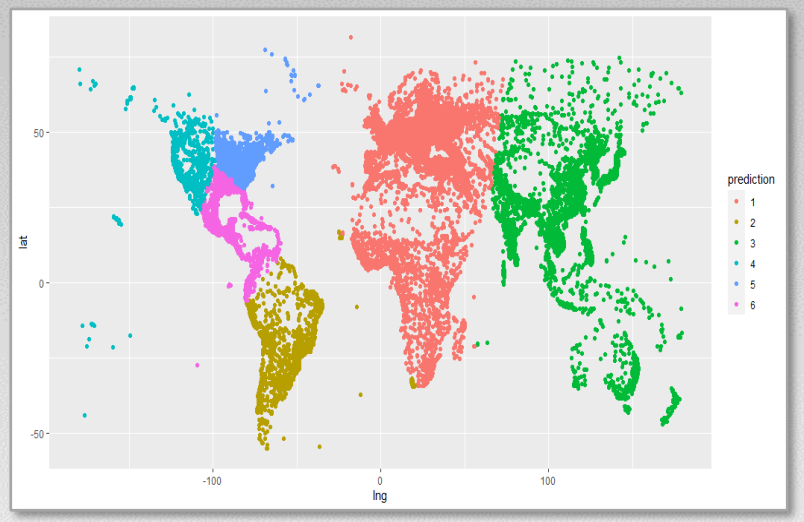


World

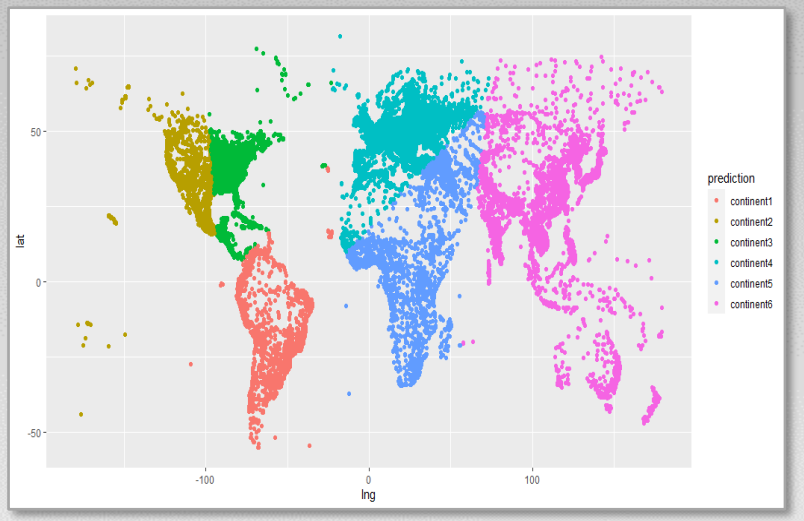
K-means (1st try)



K-means (2nd try)

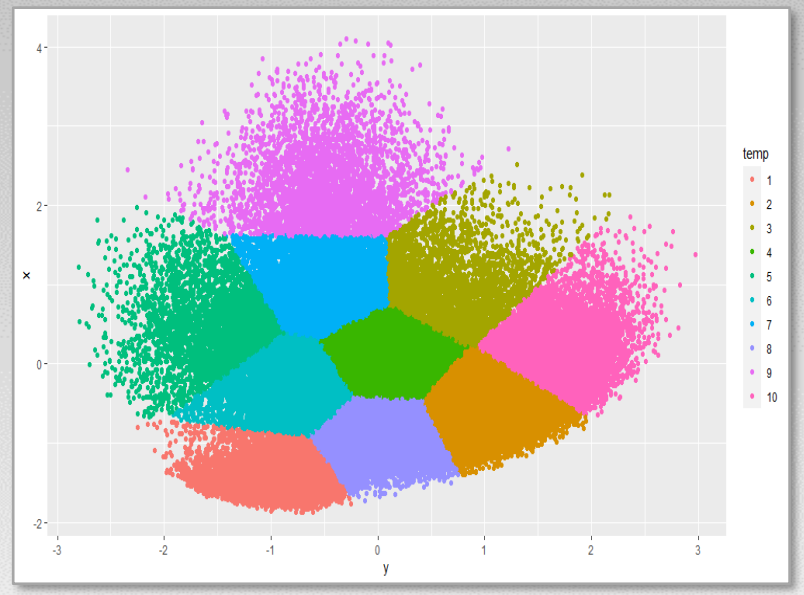


Bisecting K-means

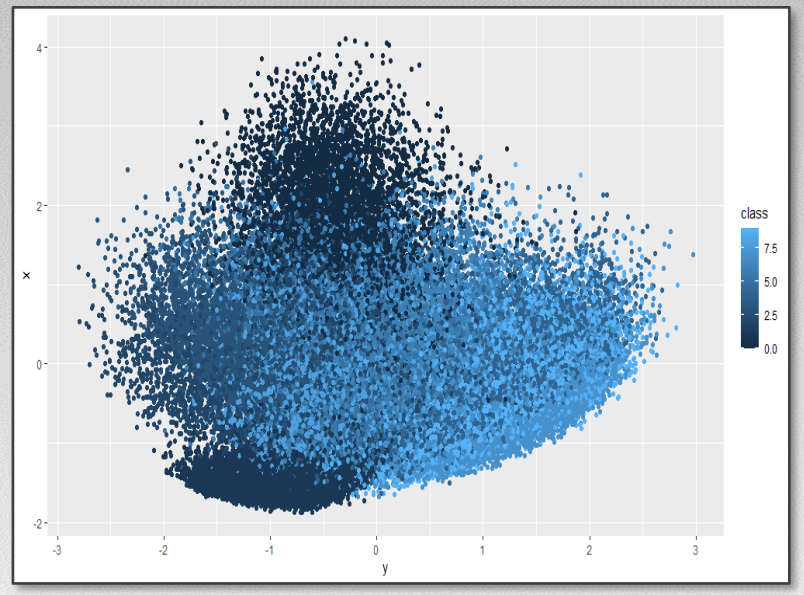


2-D MNIST (extra)

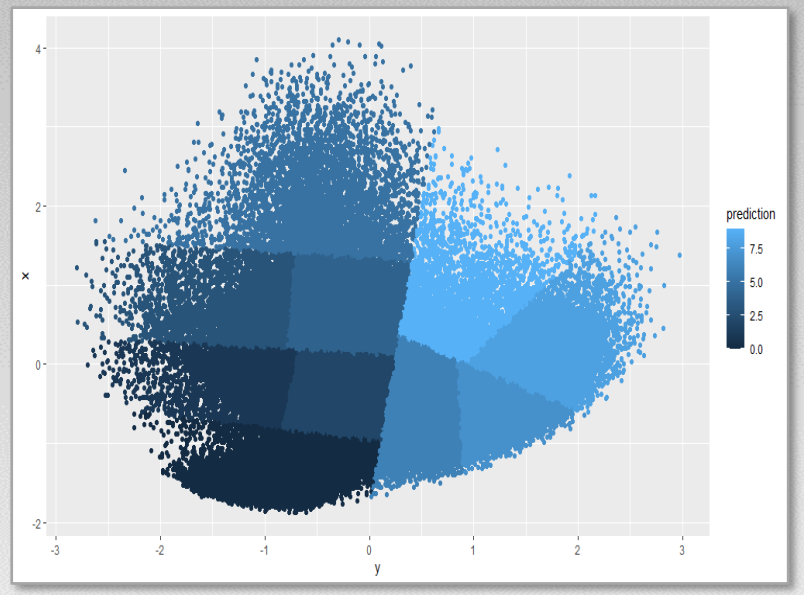
K-means



Representation



Bisecting K-means



References

- https://ijeter.everscience.org/Manuscripts/Volume-4/Issue-8/Vol-4-issue-8-M-23.pdf
- https://smorbieu.gitlab.io/generate-datasets-to-understand-some-clustering-algorithms-behavior/
- https://www.datanovia.com/en/lessons/determining-the-optimal-number-of-clusters-3-must-know-methods/
- https://www.geeksforgeeks.org/bisecting-k-means-algorithm-introduction/

Thank you for your attention!