Segmentation of The French Territory

Defense of Machine Learning

Niang Mohamed
Kaina Mohamed Abdellah
Professor : Pr. Mathilde Mougeot

MSc in Data Science: University of Paris-Saclay

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Plan

Context

- Weather Segmentation :

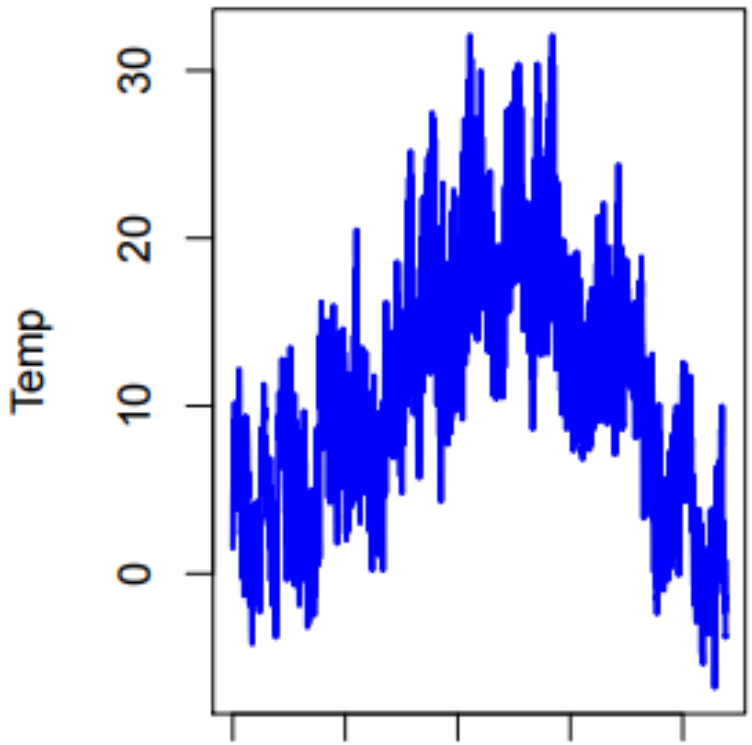
  The aim of this project is to perform a segmentation of the French territory based on Temperature and Wind time series gathered at n = 259 grid points using several clustering methods

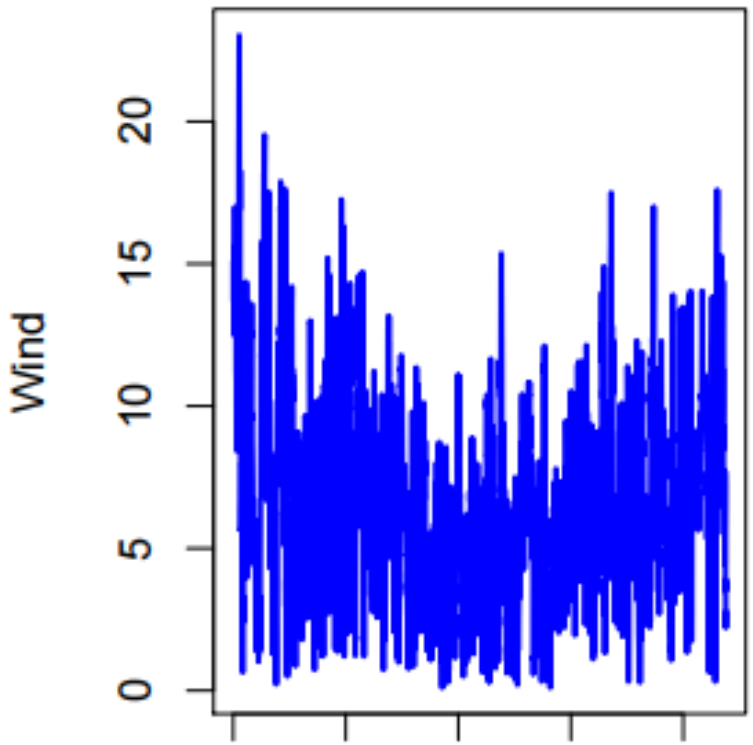
- Weather Data :

  The “weatherdata.Rdata” data set provides temperature and wind temporal evolution for n = 259 grid points at an hourly sampling rate for a given year (p = 8760 hours). Temp denotes the time series for the temperature Wind denotes the time series for the wind. The GPSpos variable contains the GPS positions (longitude and latitude) of the time series grid points

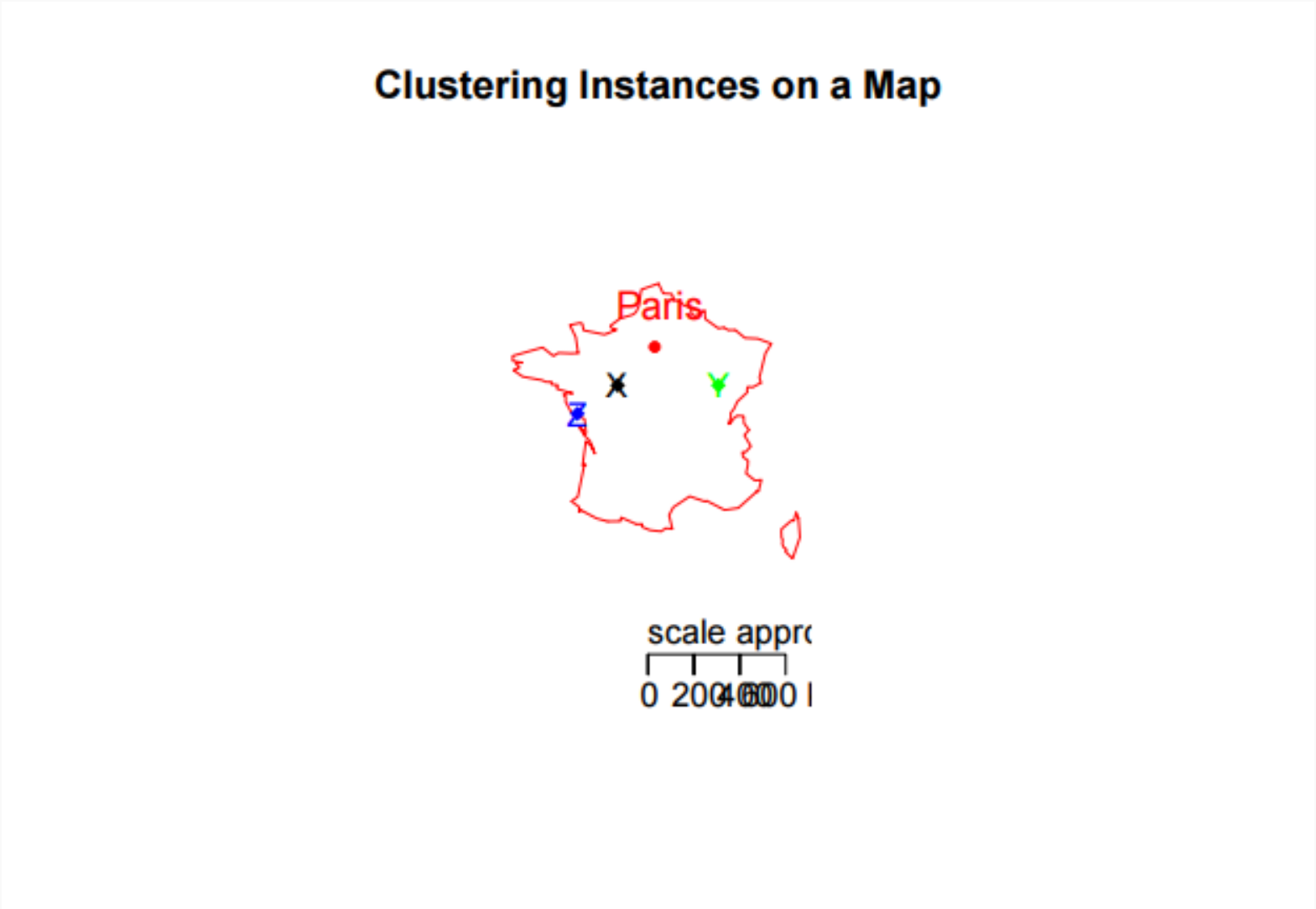
Display The Temperature and Wind Data for Paris City

Paris city is located at a latitude of 48.51 and a longitude of 2.20 and corresponds to the point i = 59 in the data base



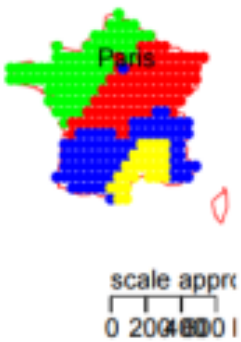


Clustering Instances on a Map

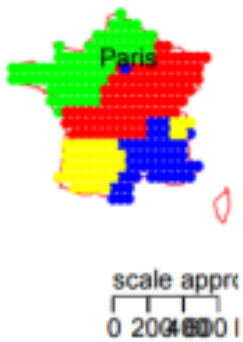


Comparison of The Results without PCA

Clustering Instances on a Map Using Kmeans

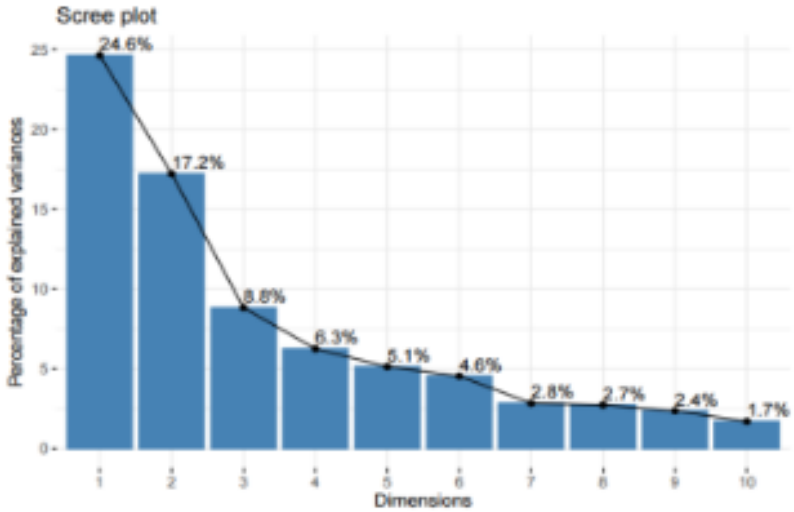


Clustering Instances on a Map Using Hclust



Kmeans	Stats.Kmeans	Hclust	Stats.Hclust
within.cluster.ss	8181826.681	within.cluster.ss	8744705.954
avg.silwidth	0.198	avg.silwidth	0.182

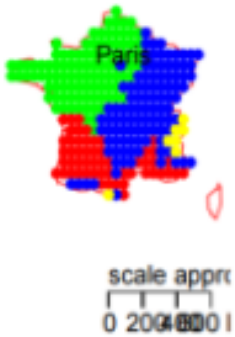
Comparison of The Results with PCA



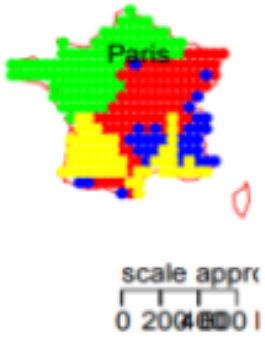
Kmeans.With.PCA	Stats.Kmeans.With.PCA	Hclust.With.PCA	Stats.Hclust.With.PCA
within.cluster.ss	845828.669	within.cluster.ss	919879.678
avg.silwidth	0.256	avg.silwidth	0.226

Comparison of The Results without PCA

Clustering Instances on a Map Using Kmeans

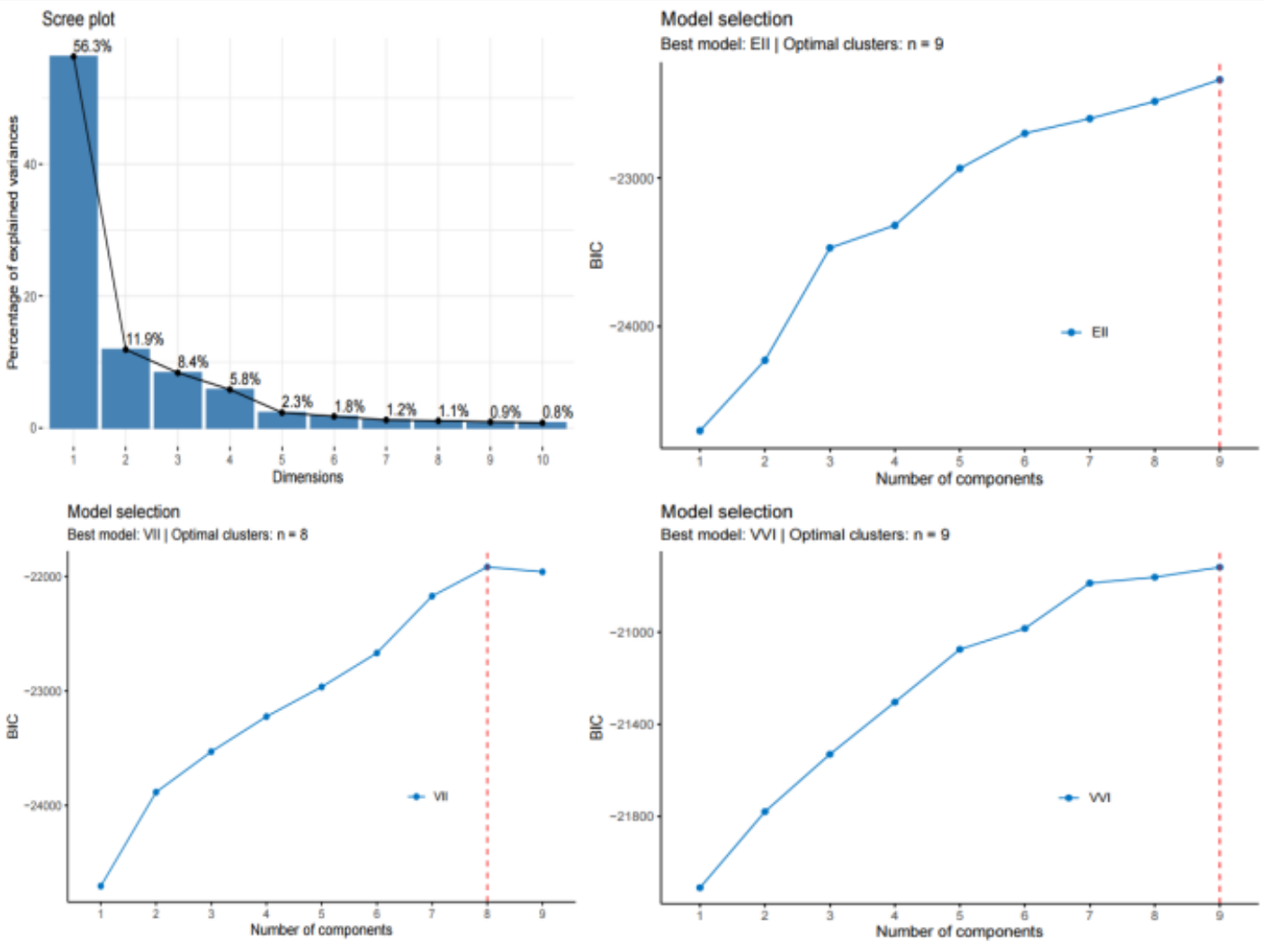


Clustering Instances on a Map Using Hclust

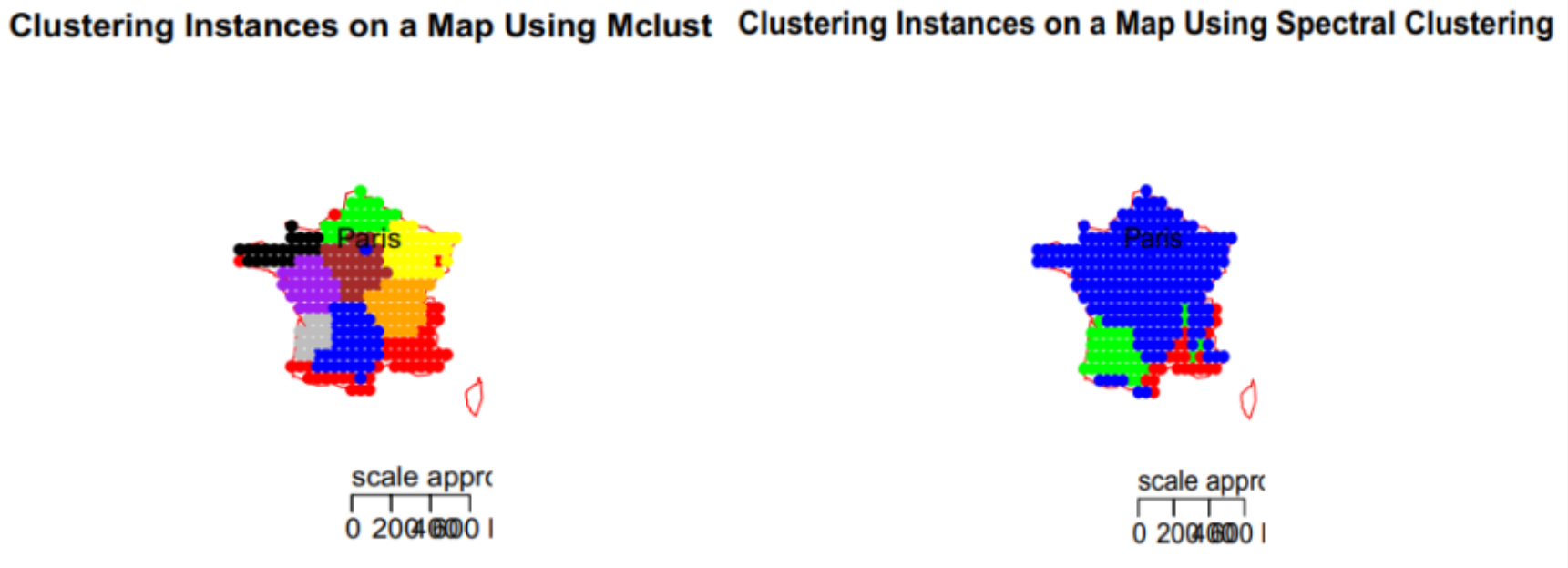


Kmeans	Stats.Kmeans	Hclust	Stats.Hclust
within.cluster.ss	8094522.932	within.cluster.ss	8535801.008
avg.silwidth	0.243	avg.silwidth	0.204

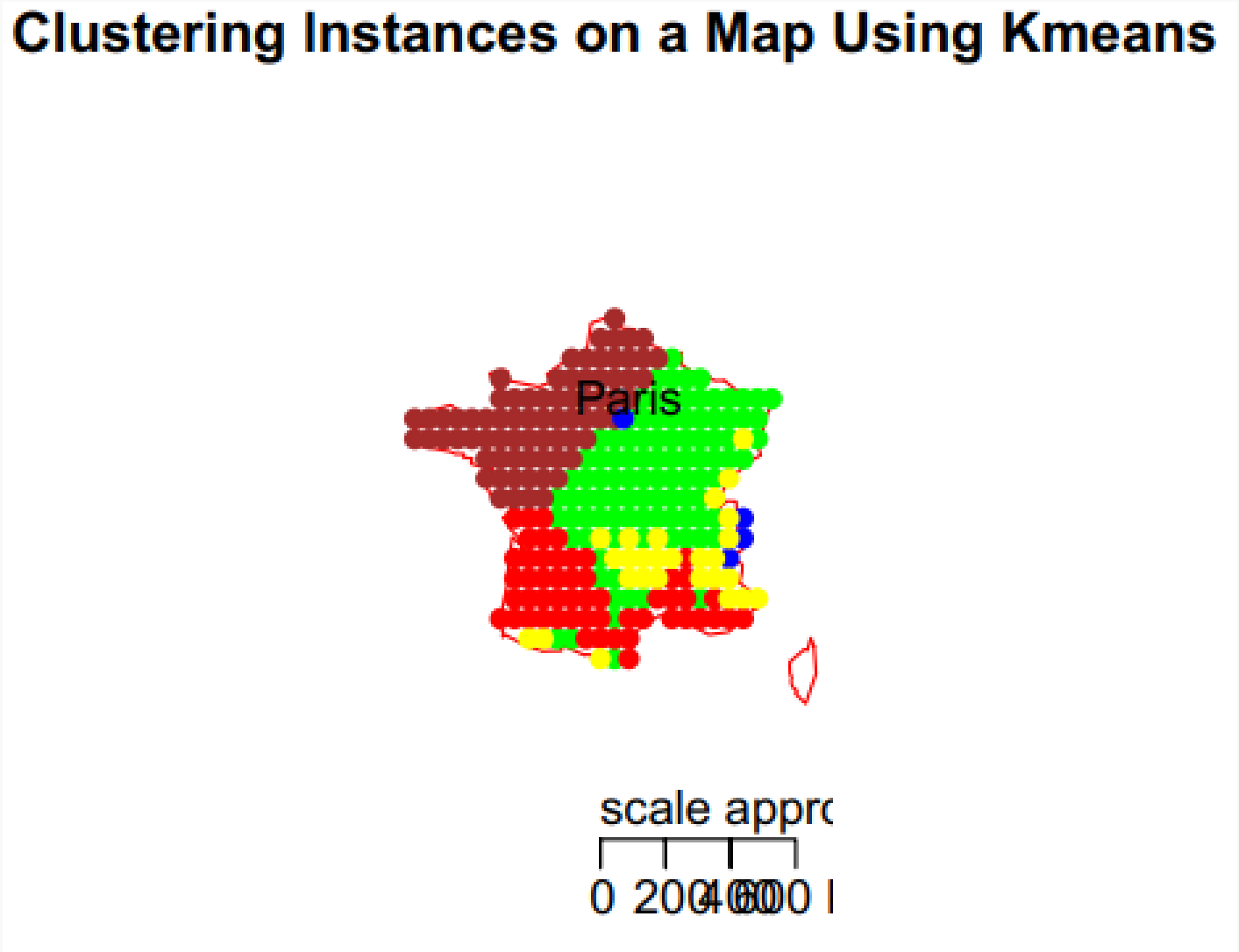
PCA and Model Selection



Comparison of The Results with PCA



Clustering Using Kmeans



Thank you for attention !