Machine Learning

Vahid Partovi Nia

R Montreal 2018

July 4, 2018

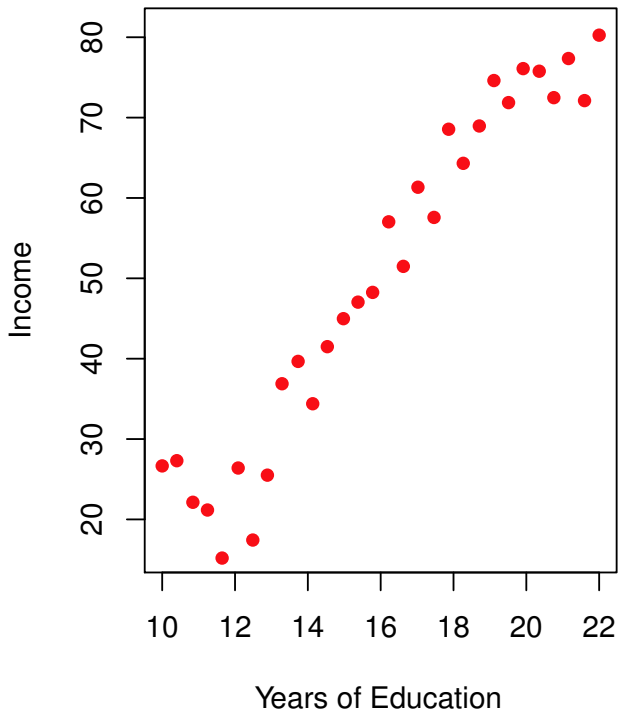
Outline

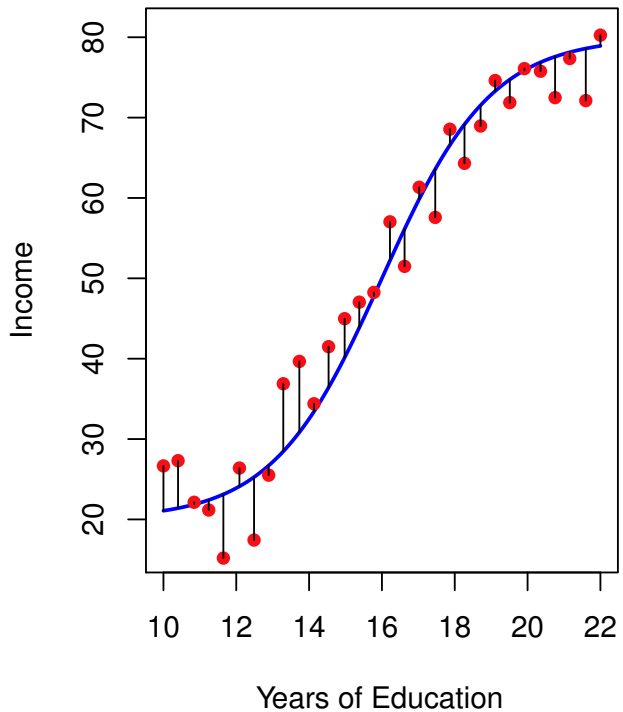
R libraries

- MASS: Advanced multivariate statistics
- devtools, tensorflow, keras: Deep learning
- e1071: Support vector machines
- imager: Plotting and handling pictures, photos, etc

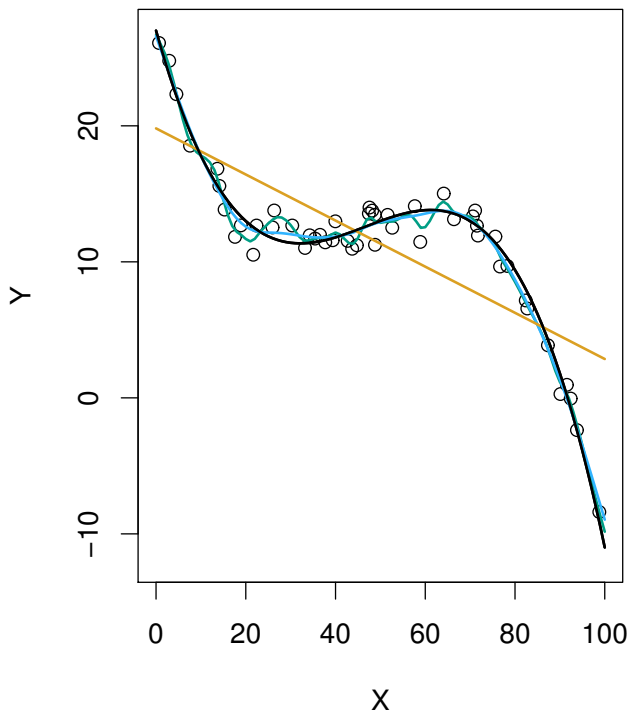
Chapter 01

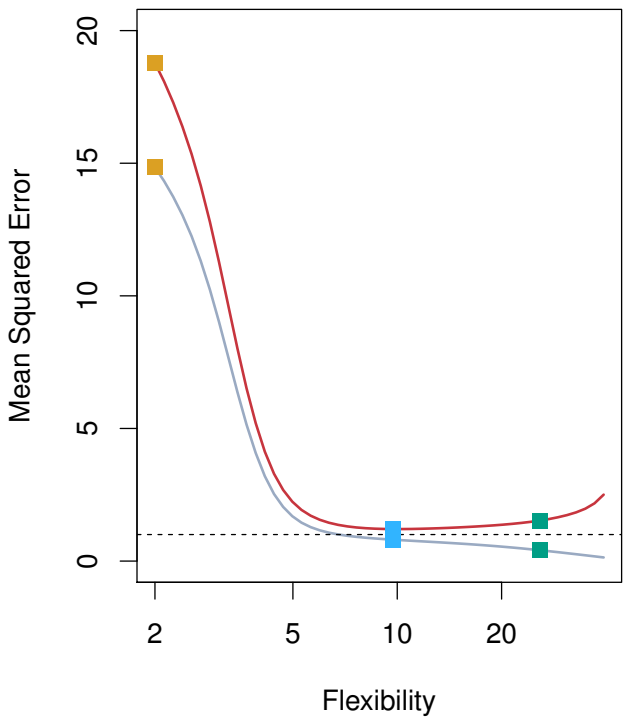
Model Error



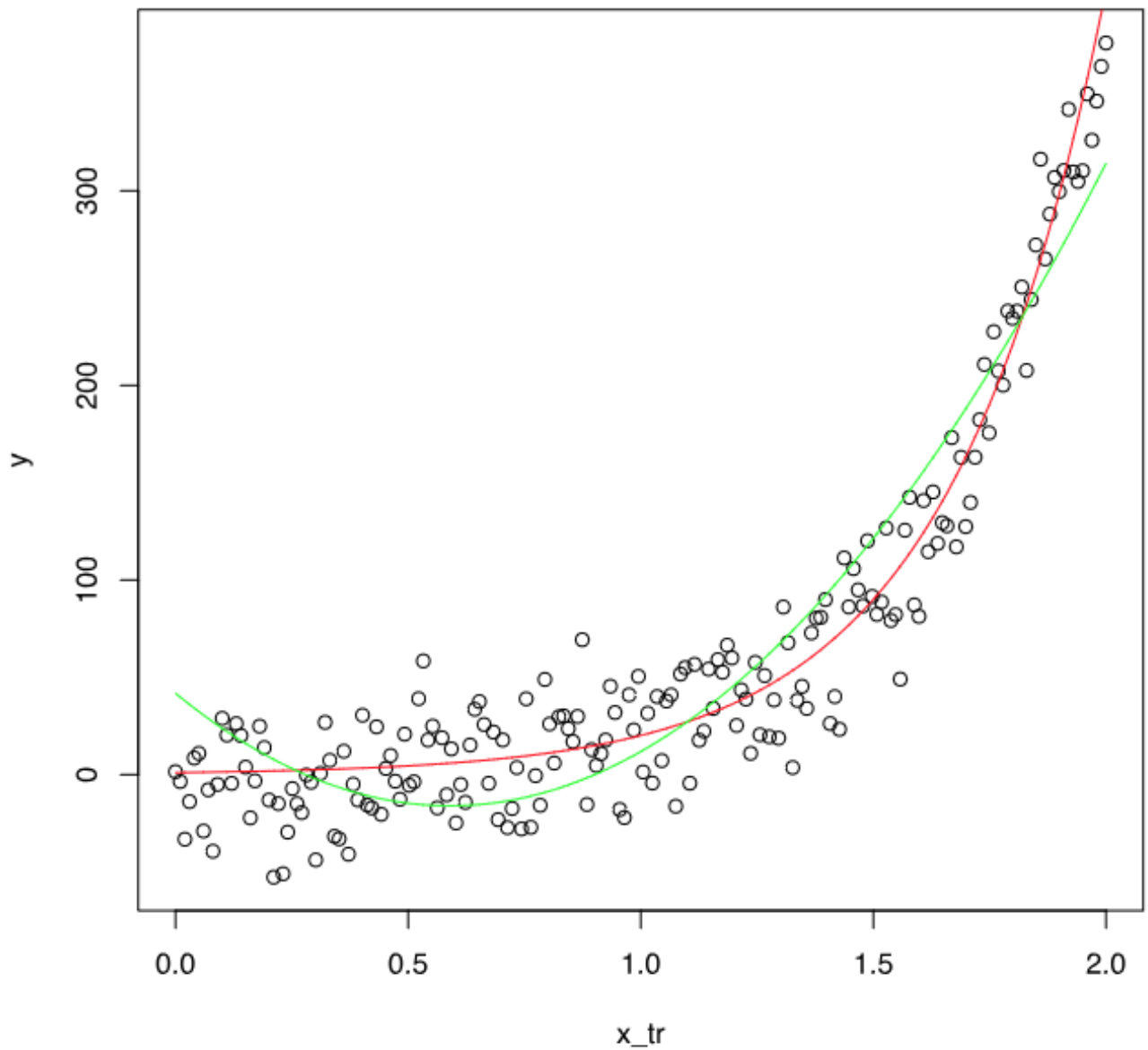


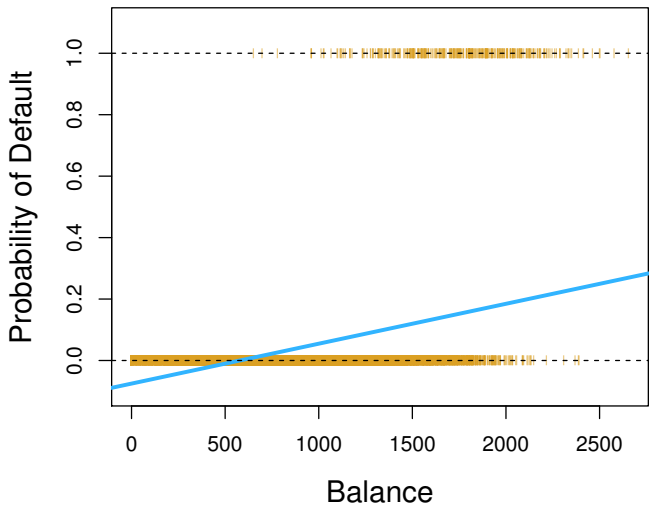
Train versus Test

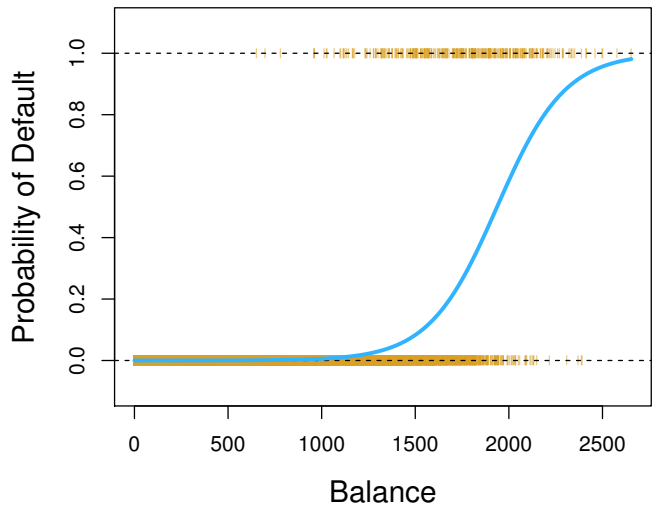




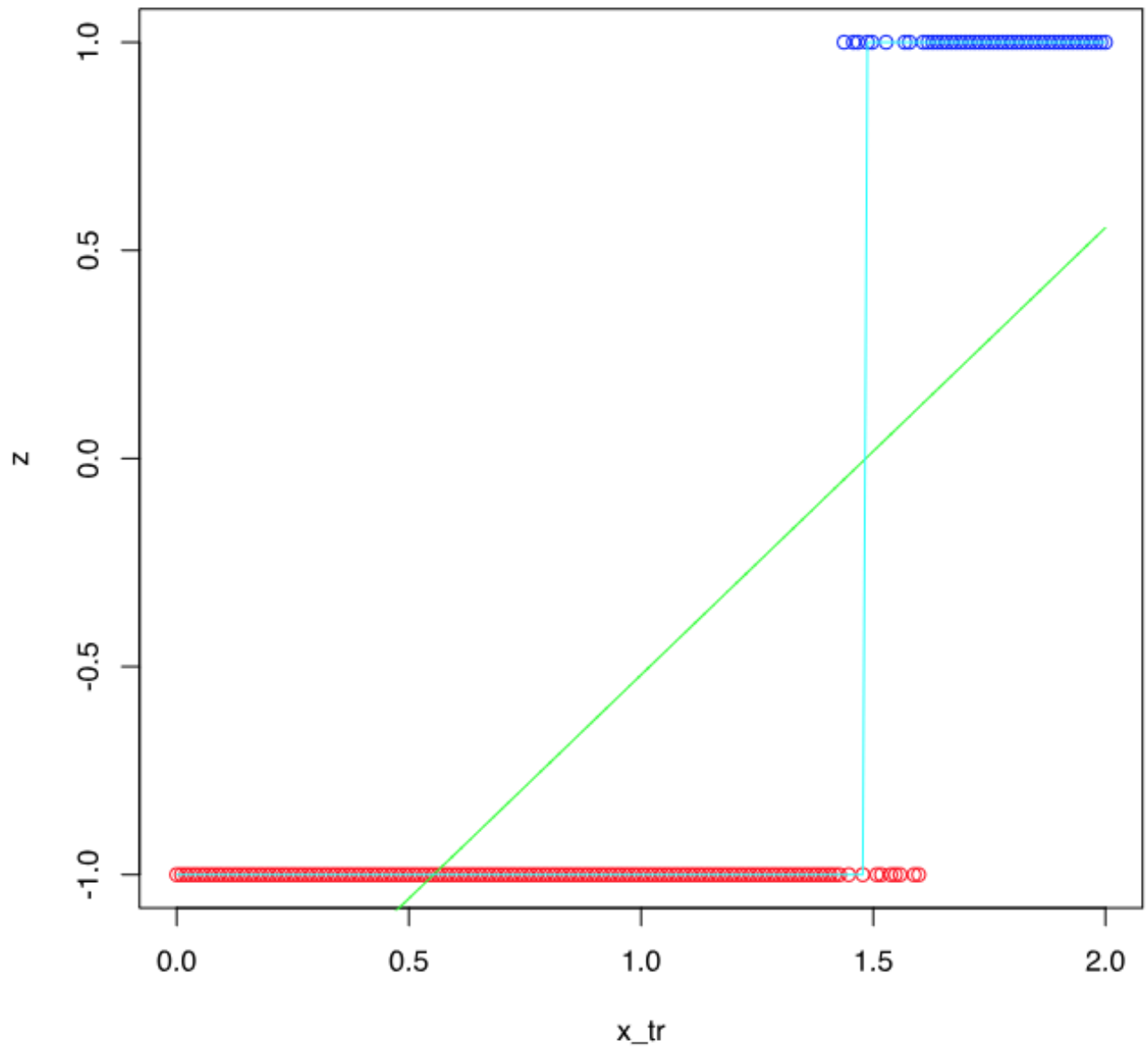
Code: Simulation



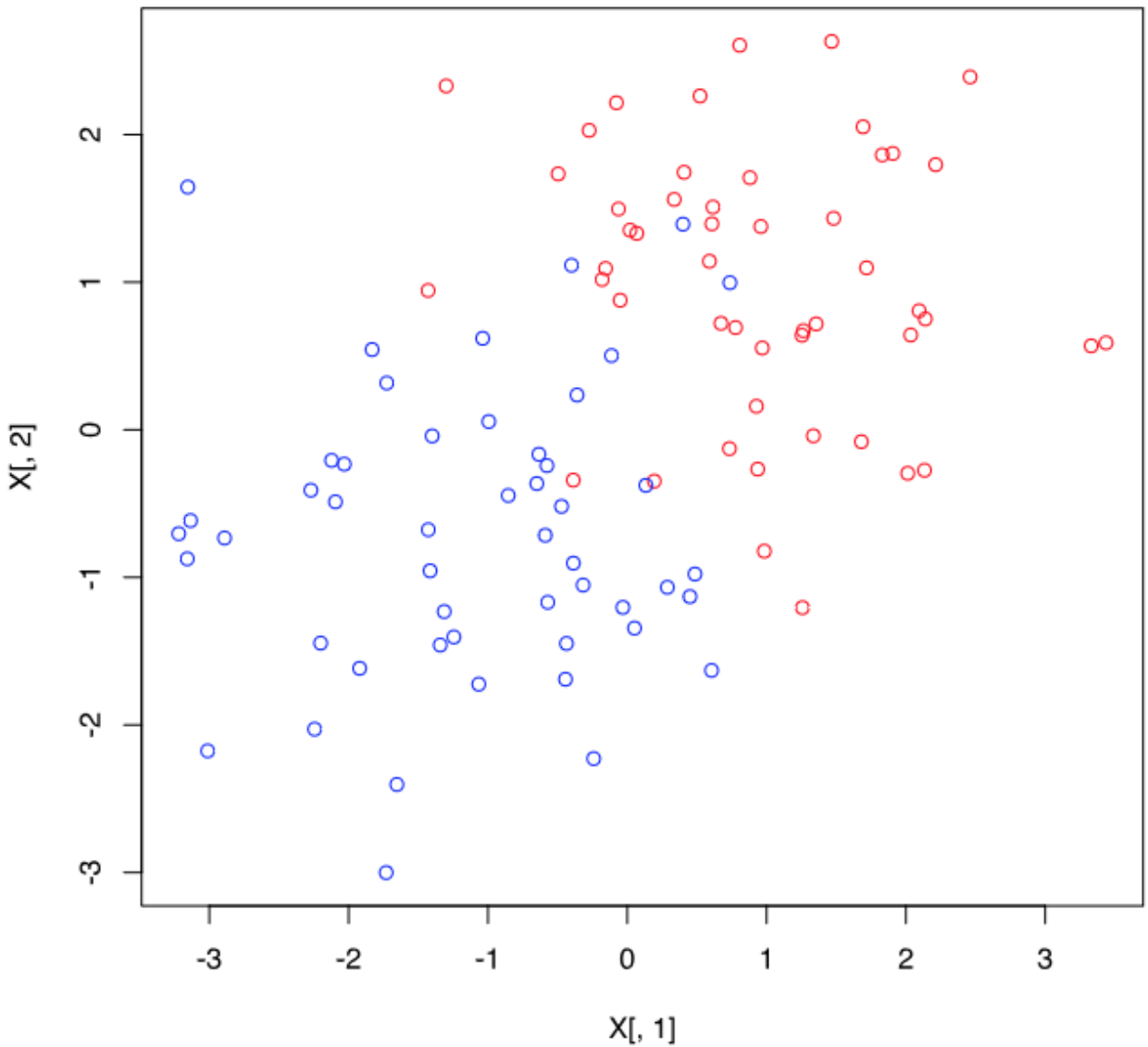




Code: Binary transform

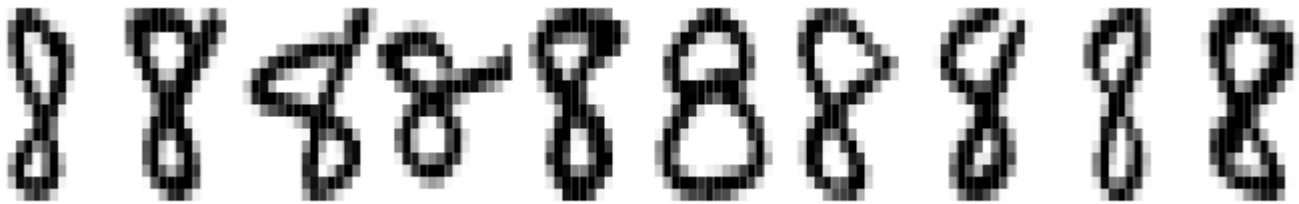


Code: Two-dimensional

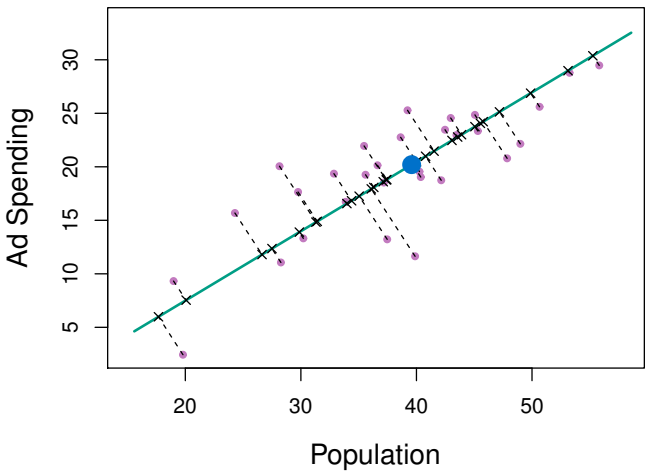


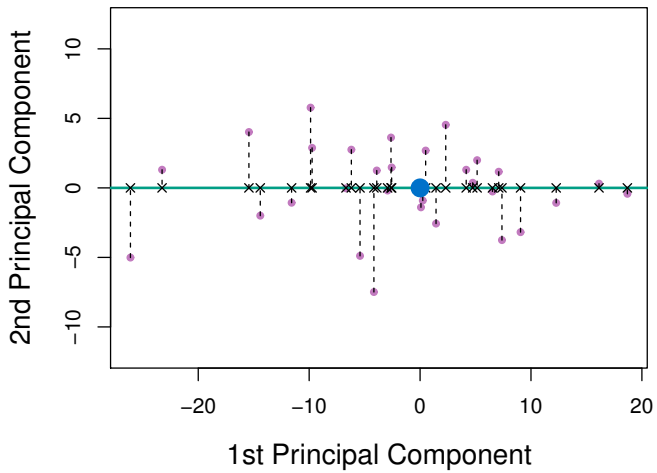
Chapter 02

Code: Zip Data

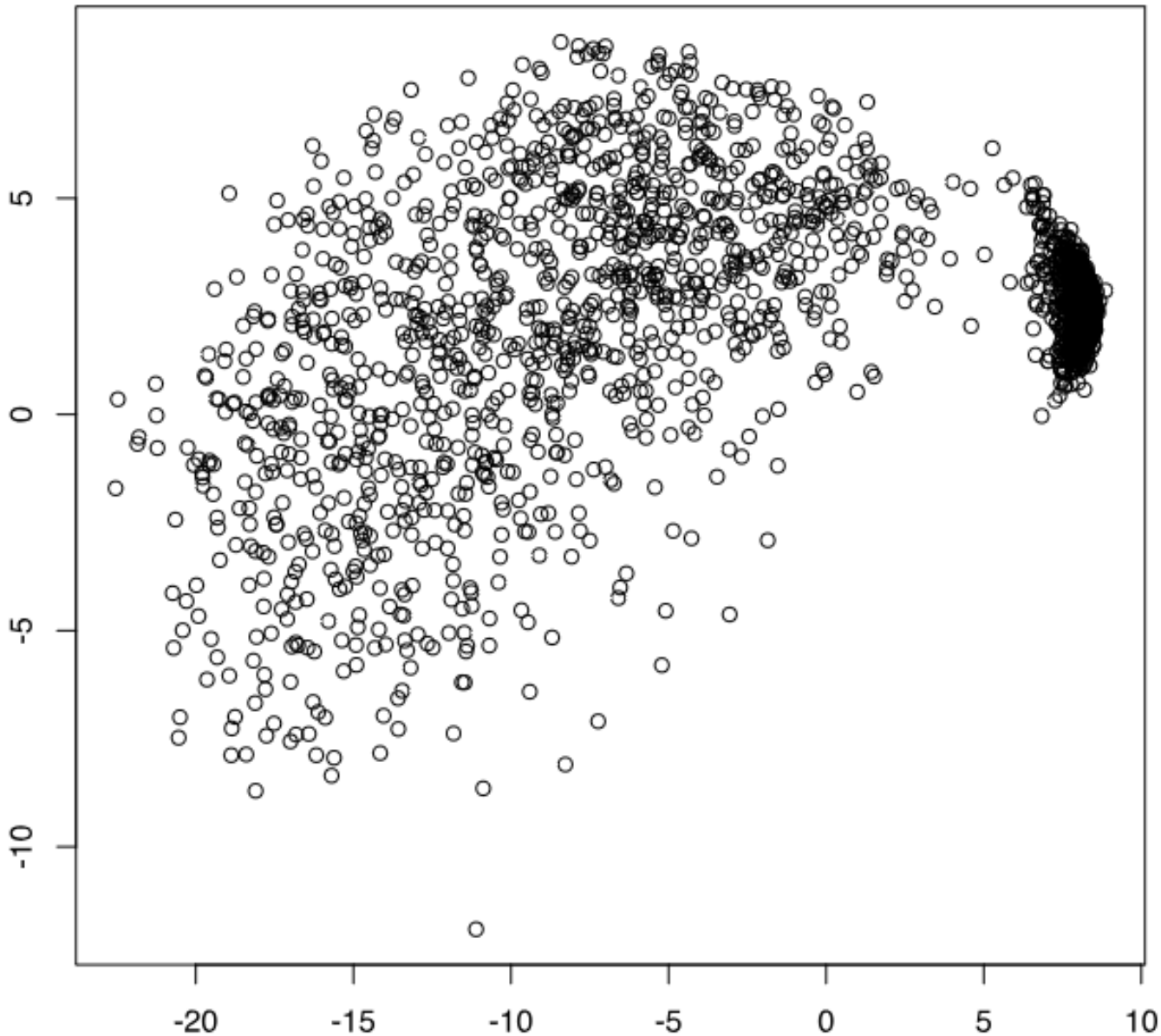


Principal Components

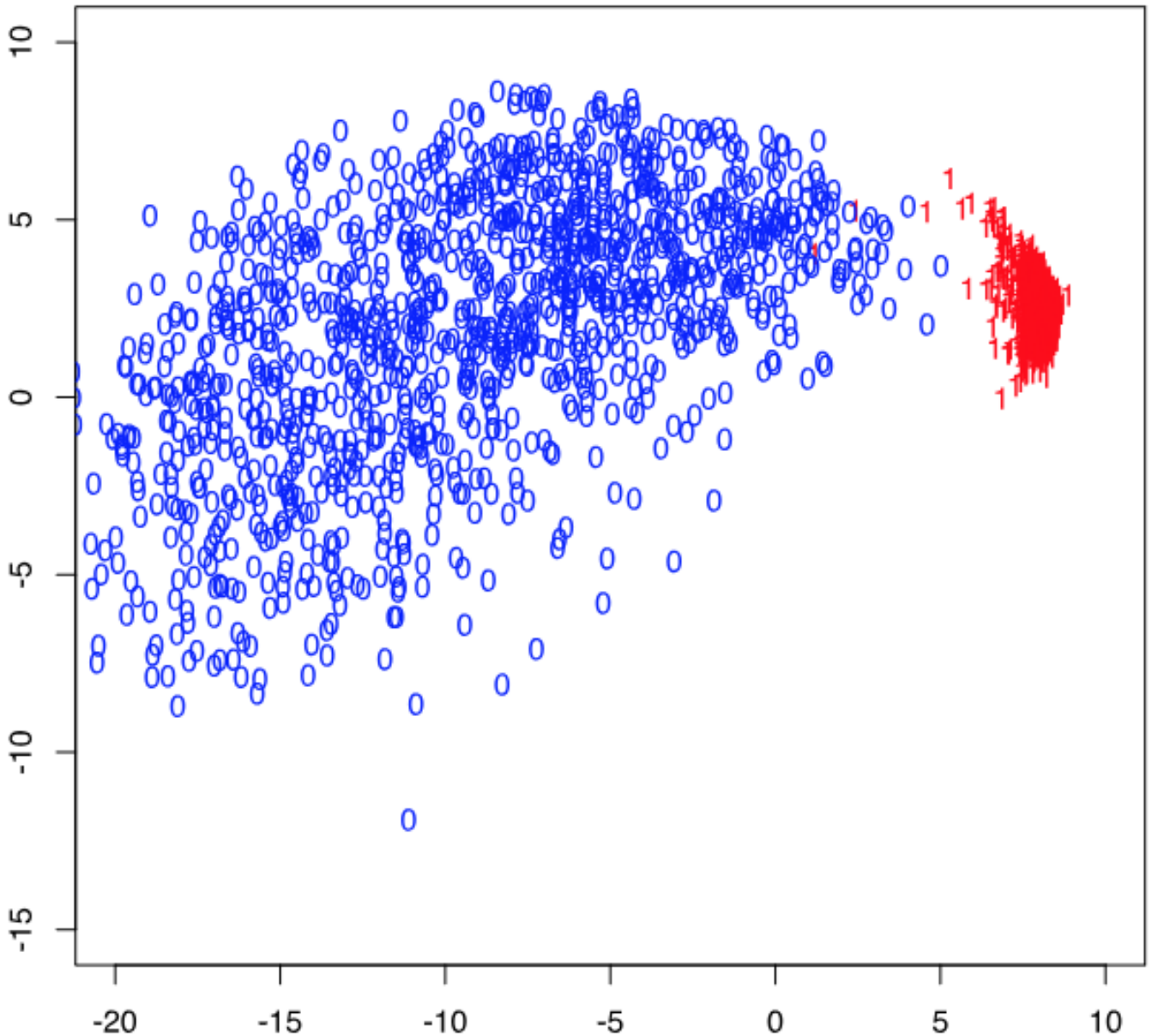




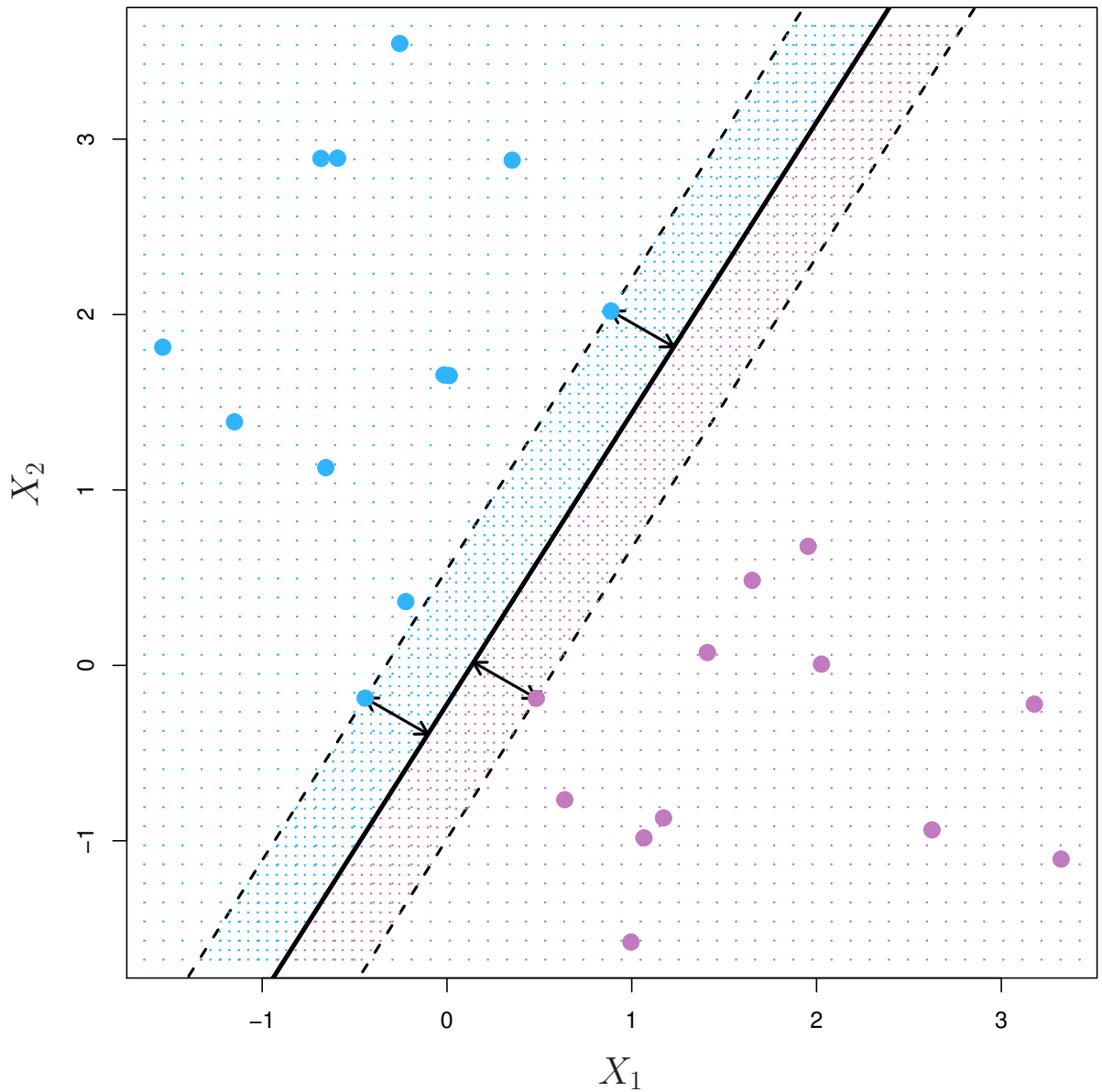
Code: PC on 0 1 digits



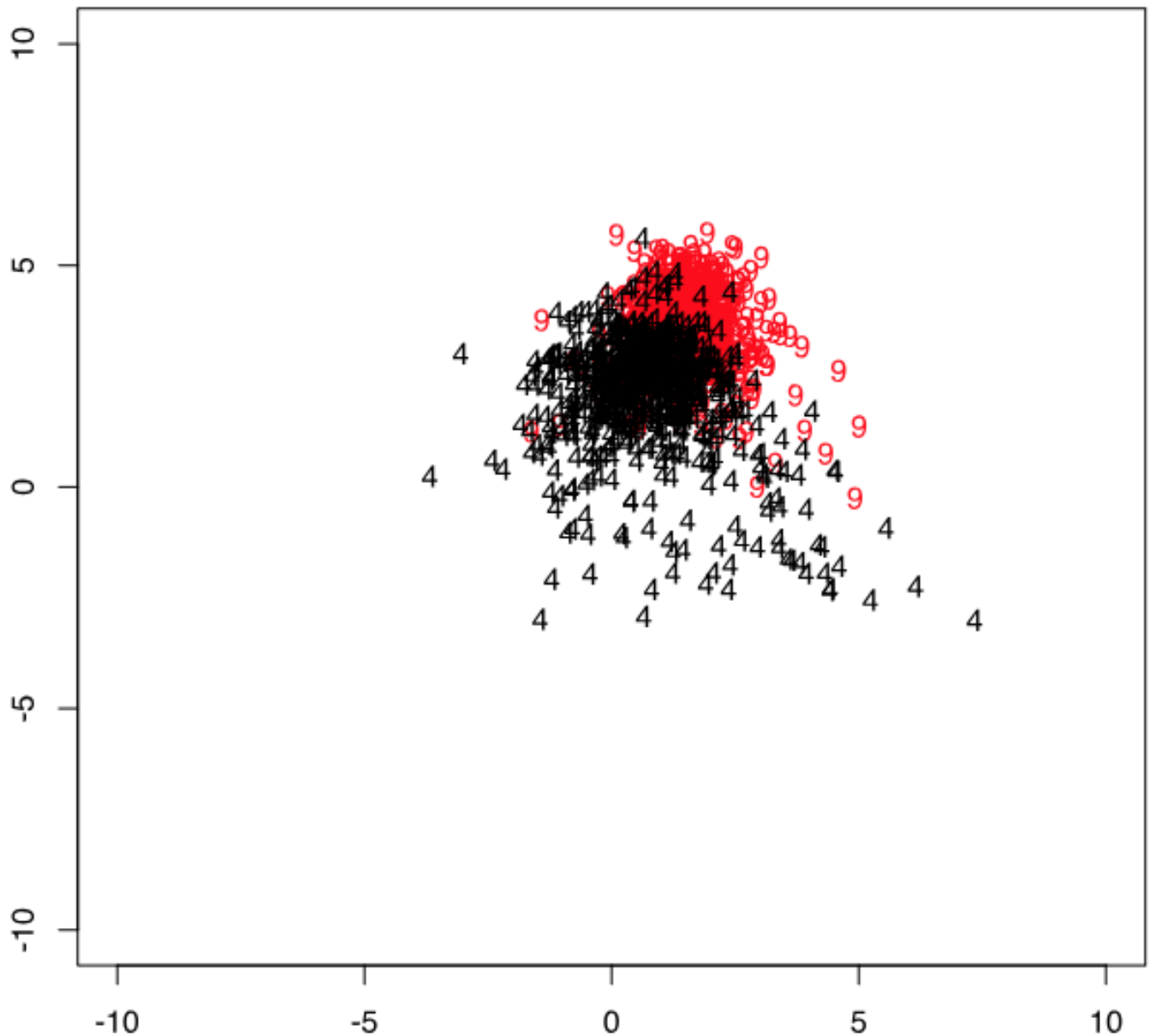
Code: PC on 0 1 digits



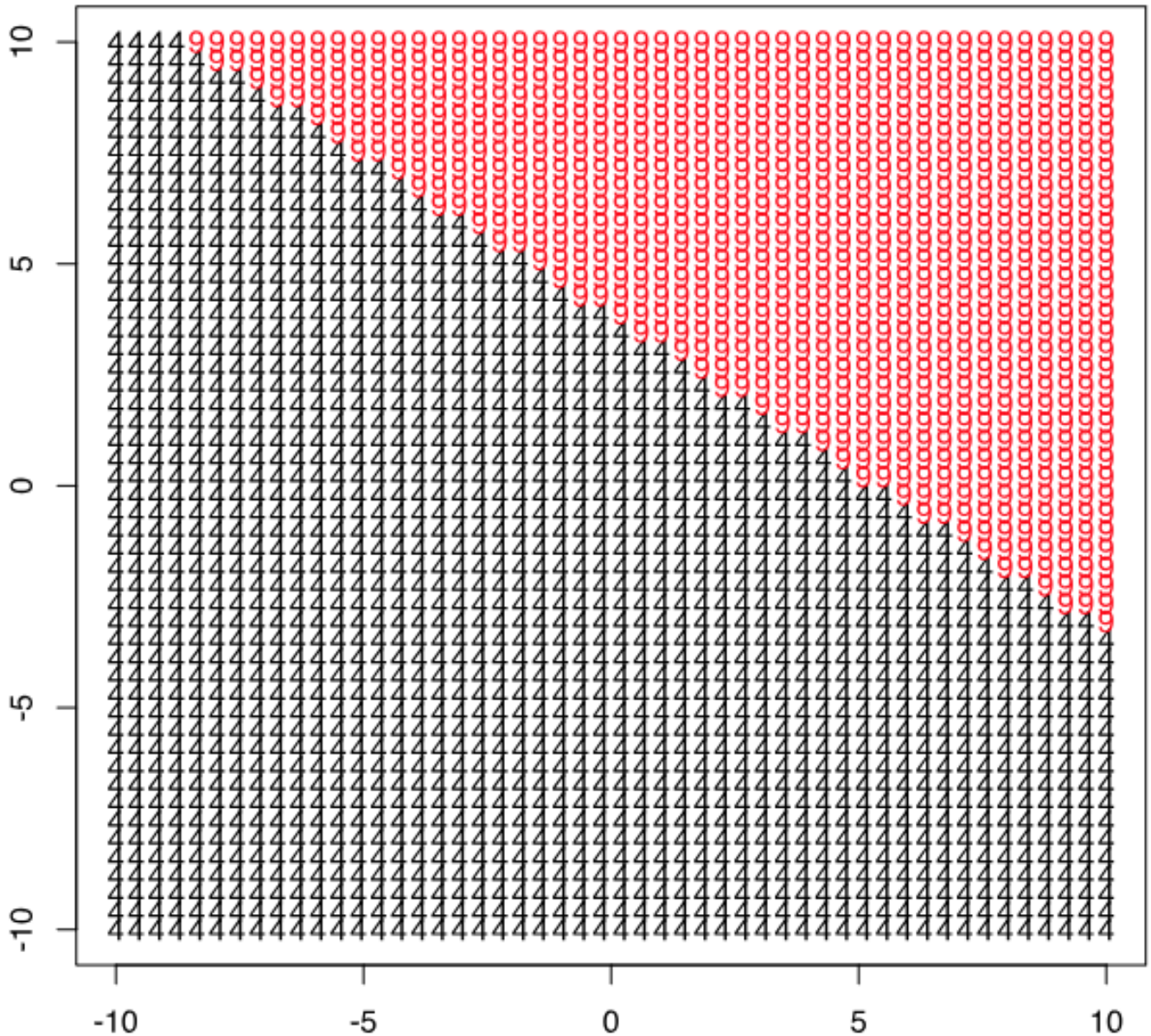
Support vector machines



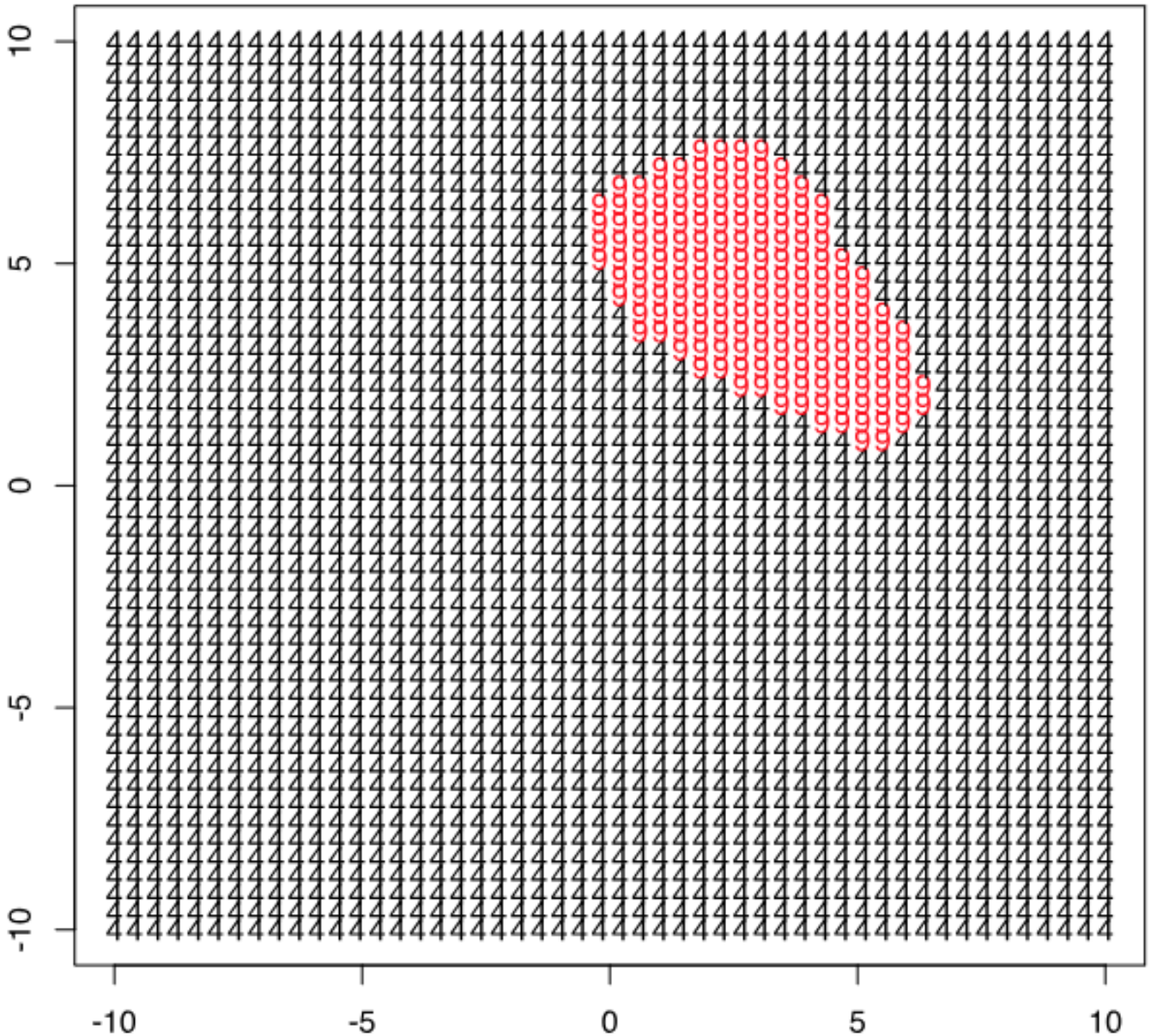
Code: SVM on digits 4 9



Code: SVM linear



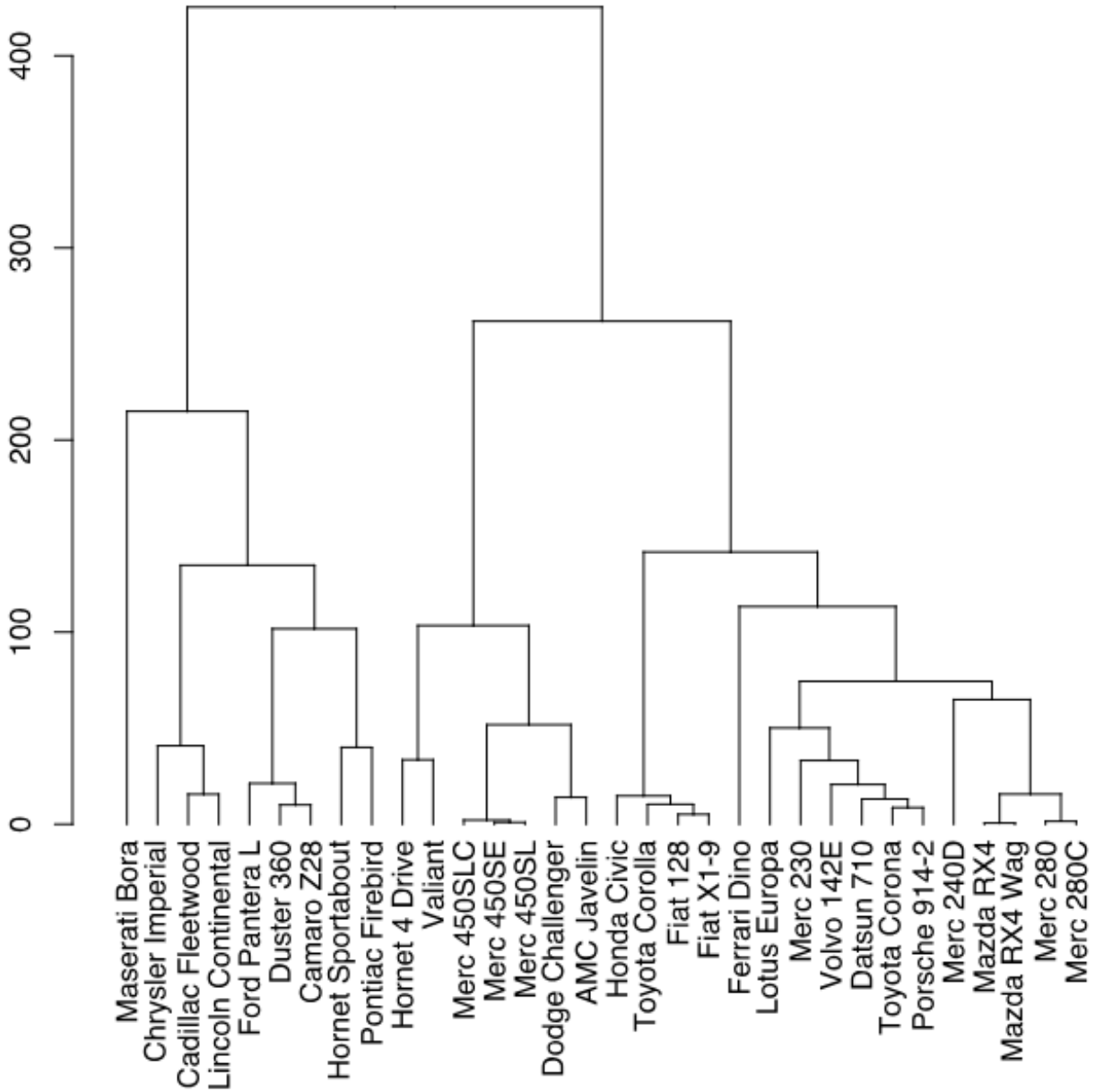
Code: SVM linear



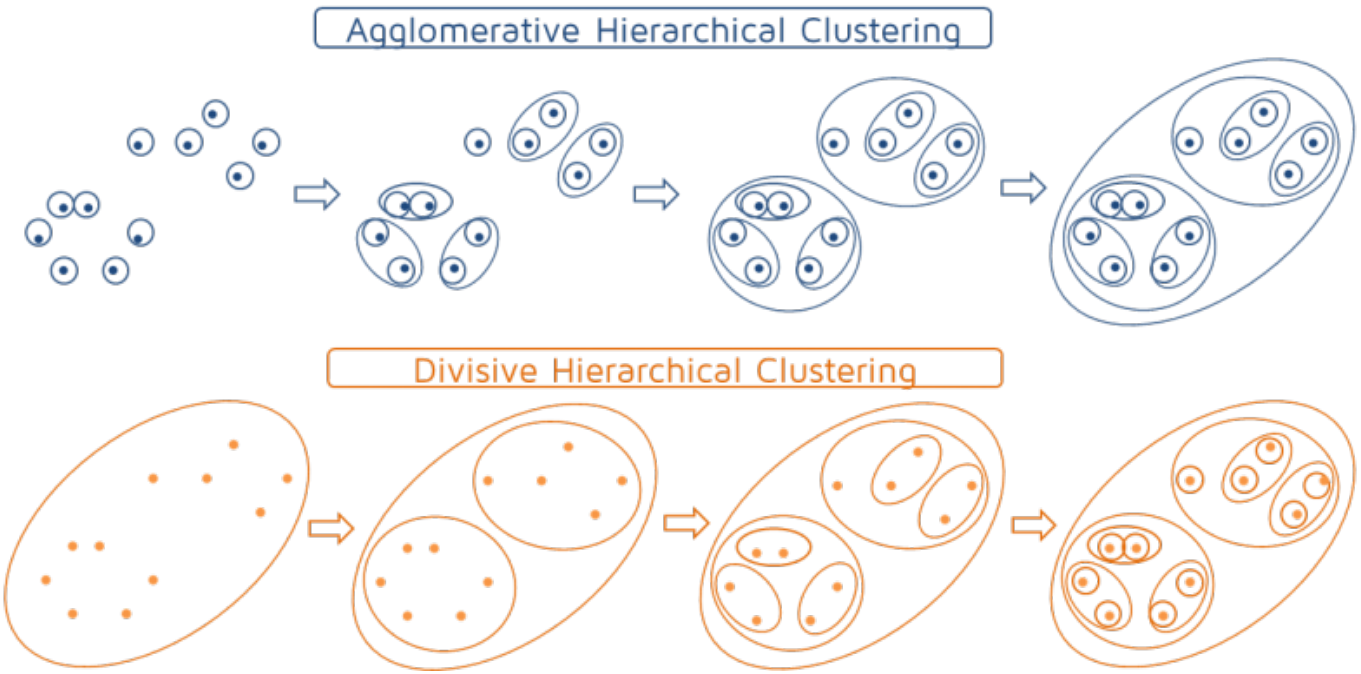
Chapter 03

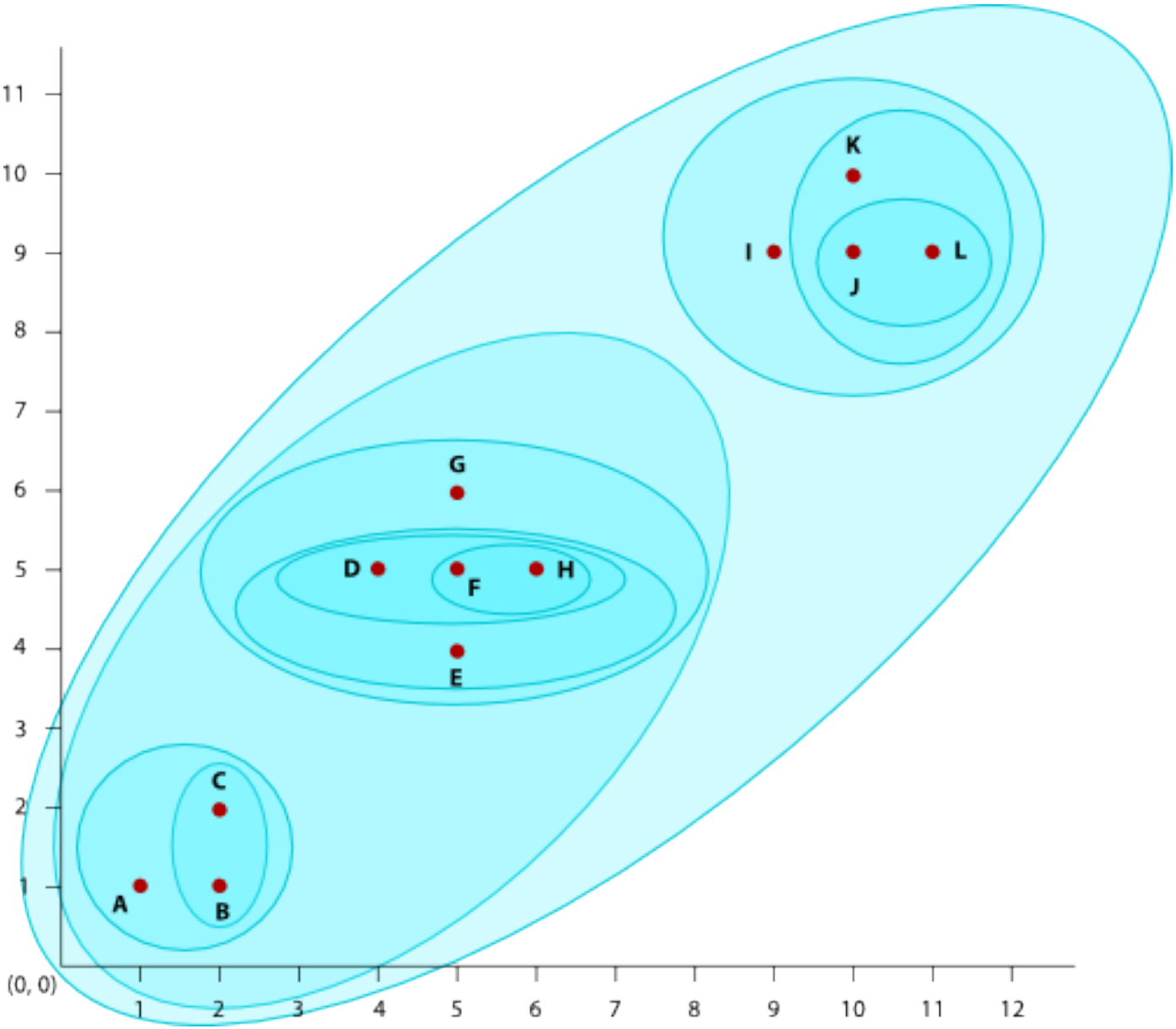
Dendrogram

Hierarchical Clustering

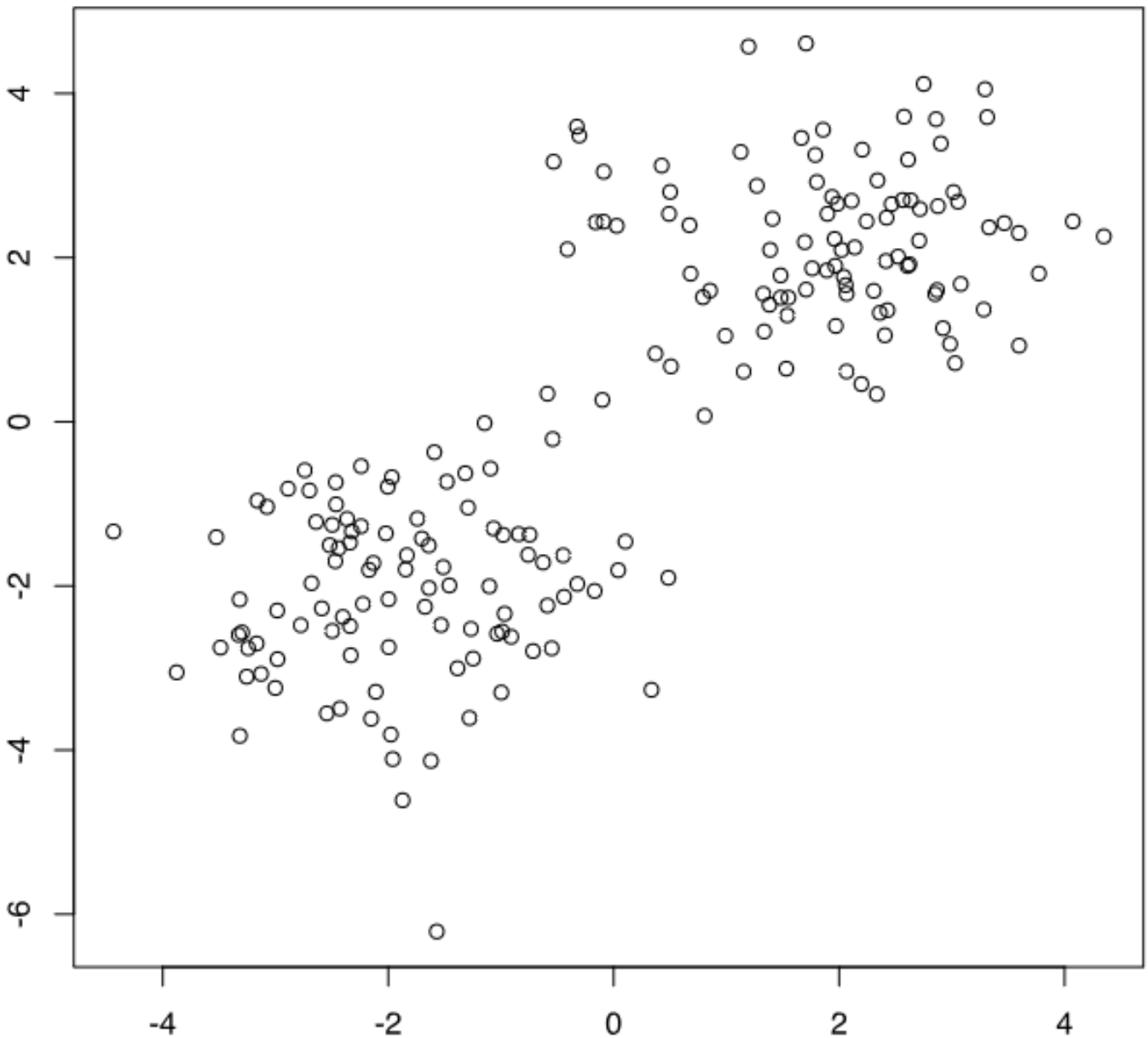


Direction: Agglomerative or Divisive

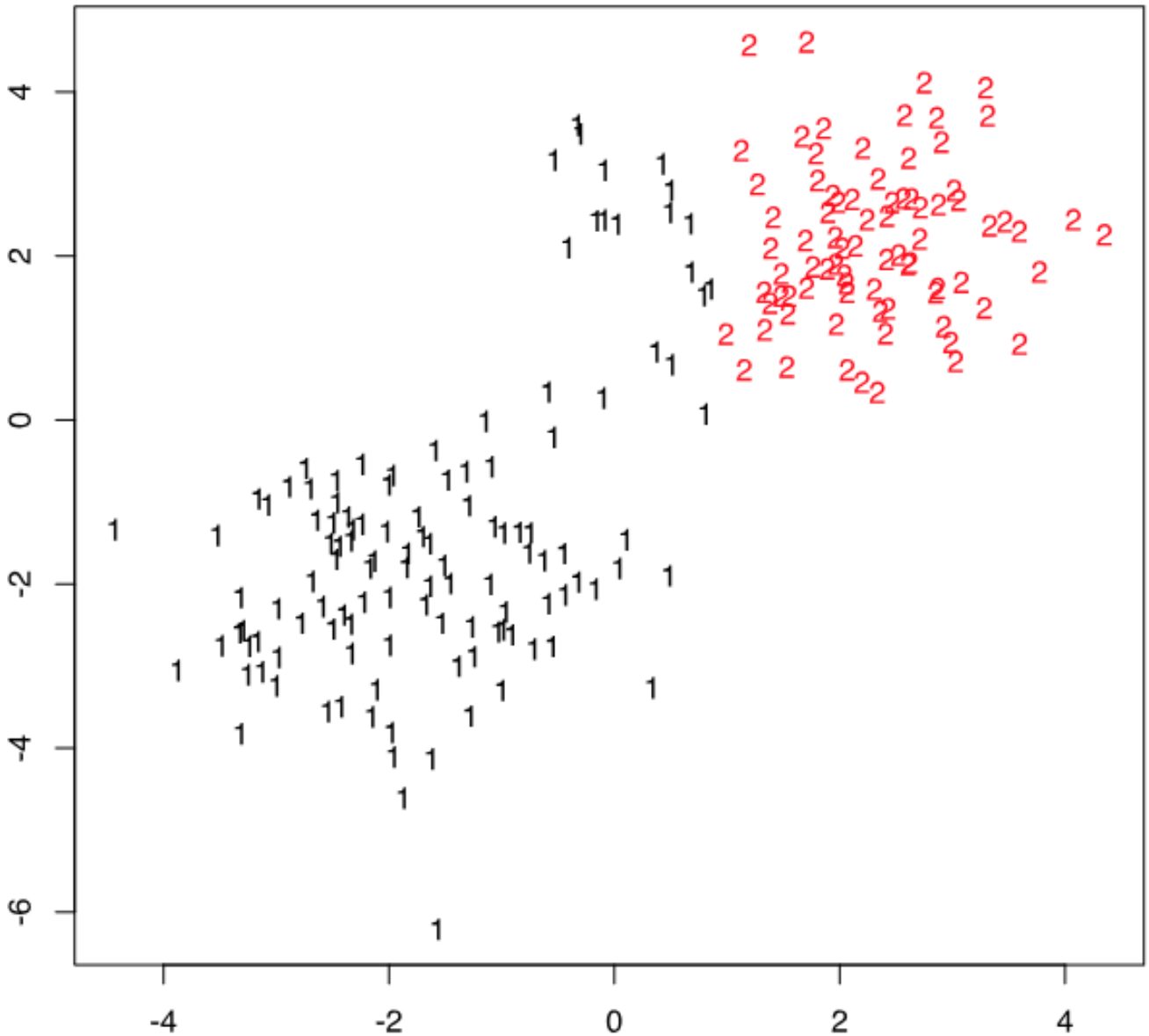




Code: Simulated Data

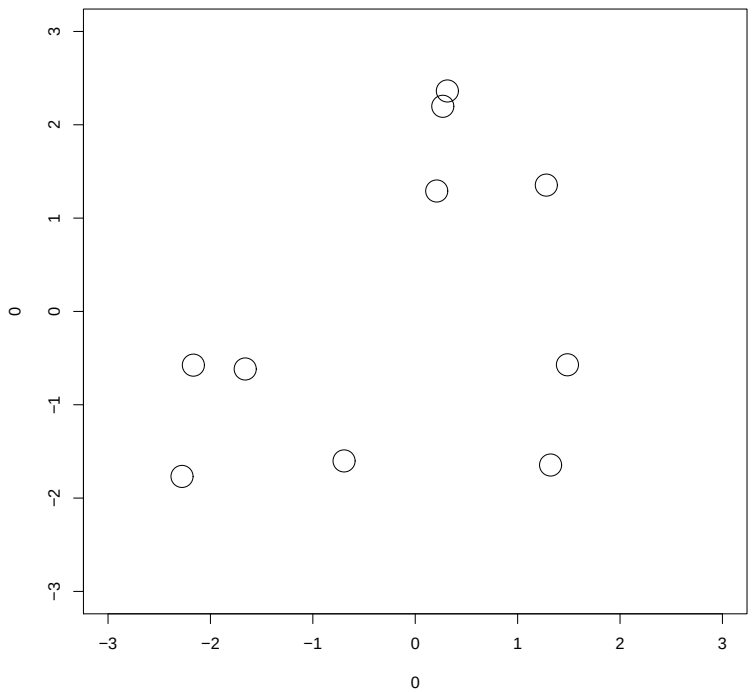


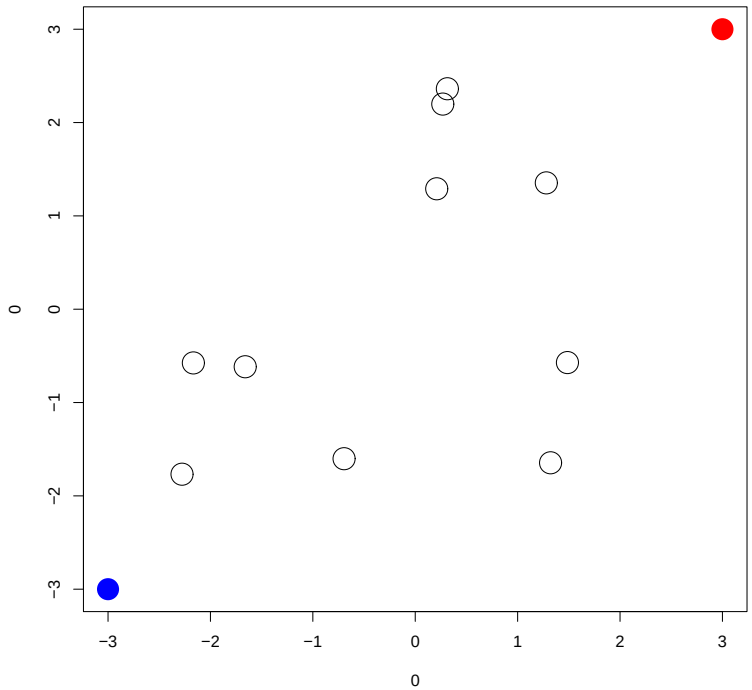
Code: Simulated Data

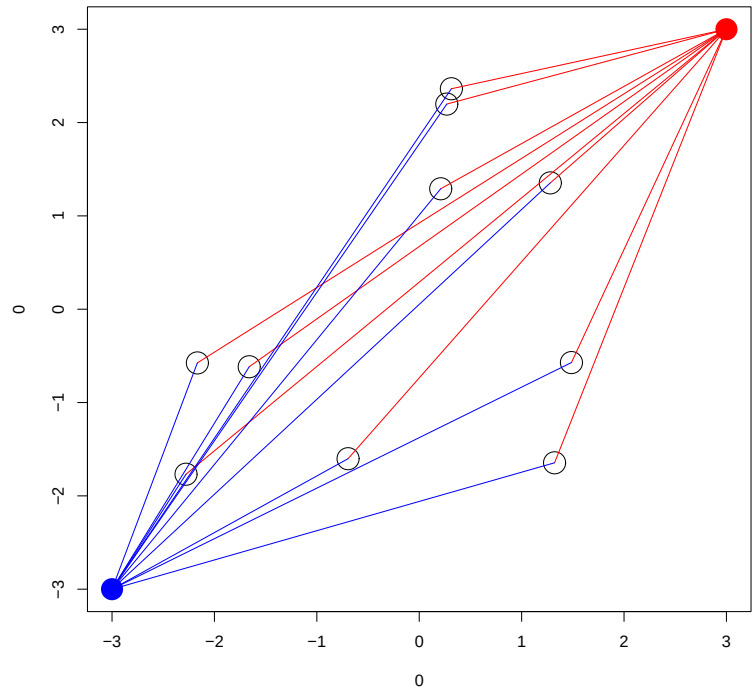


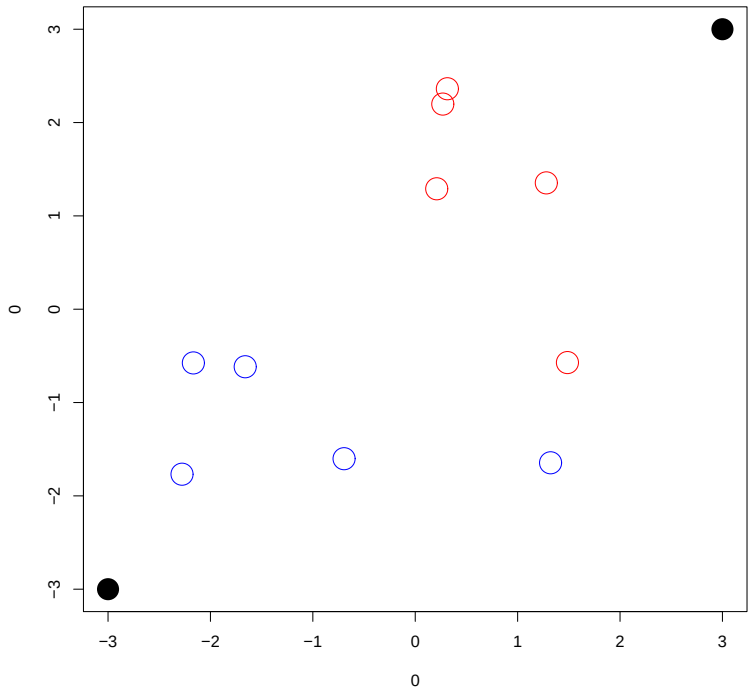
K-Means

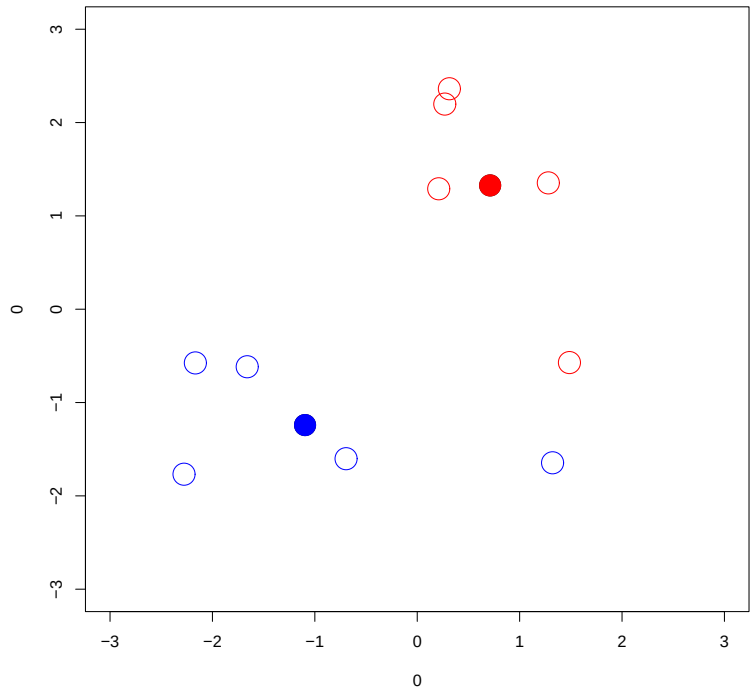
K-Means Initial 1

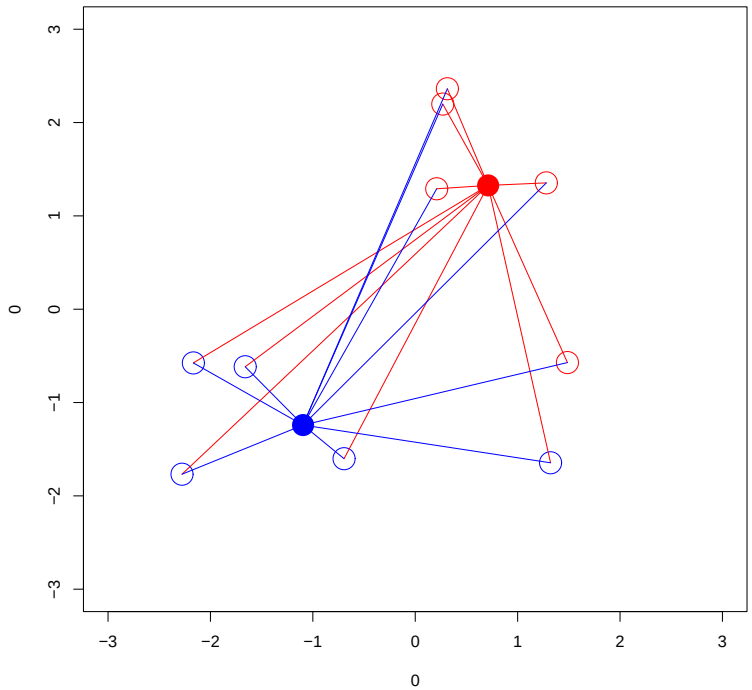


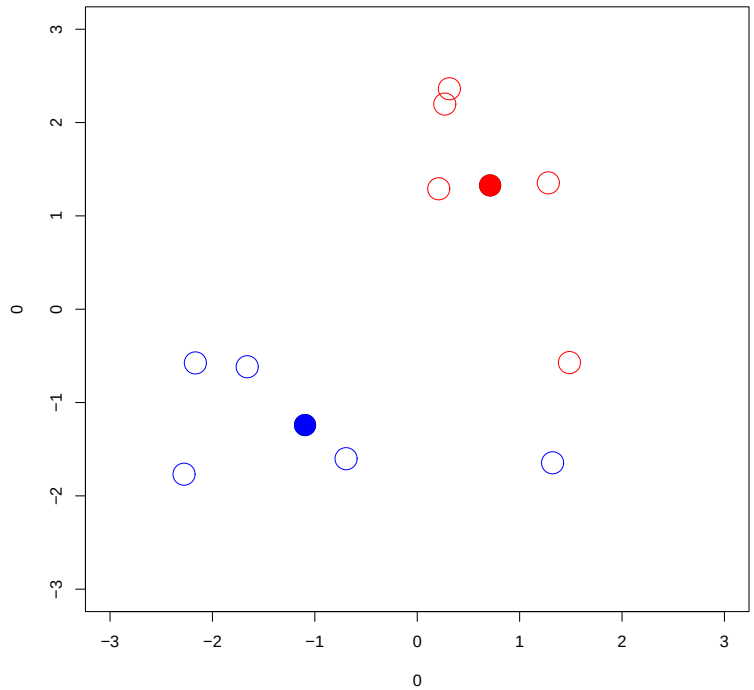




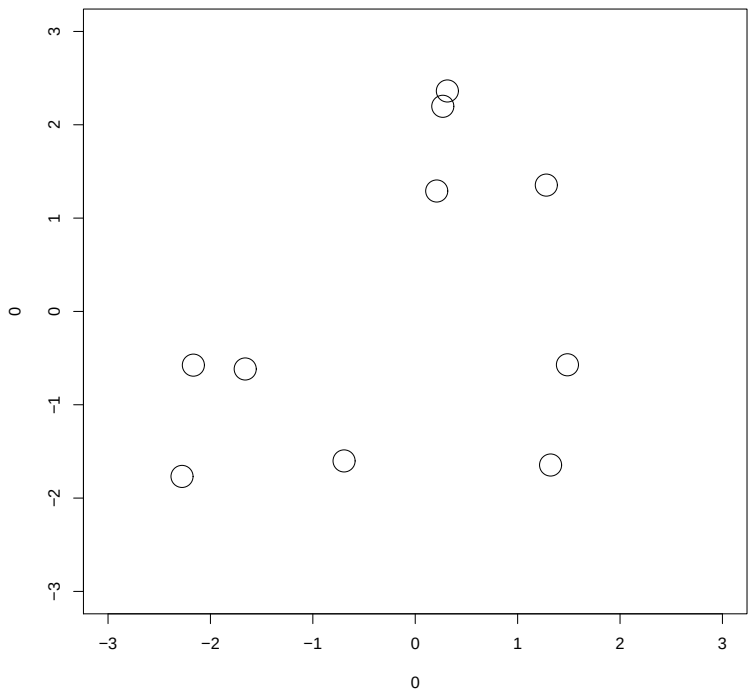


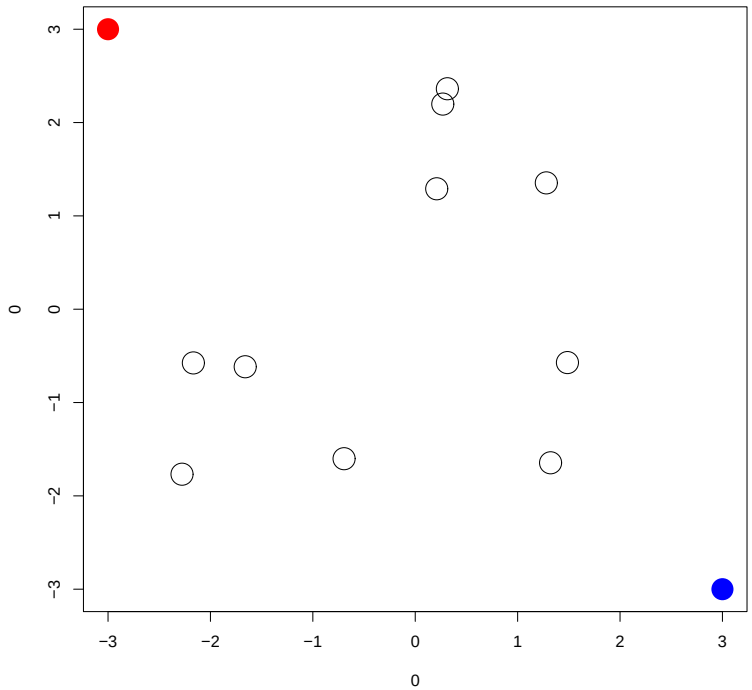


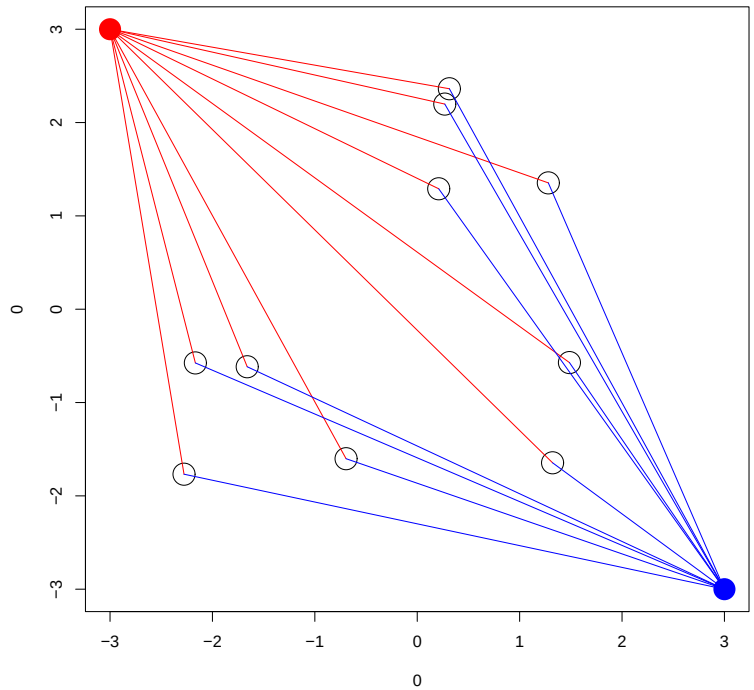


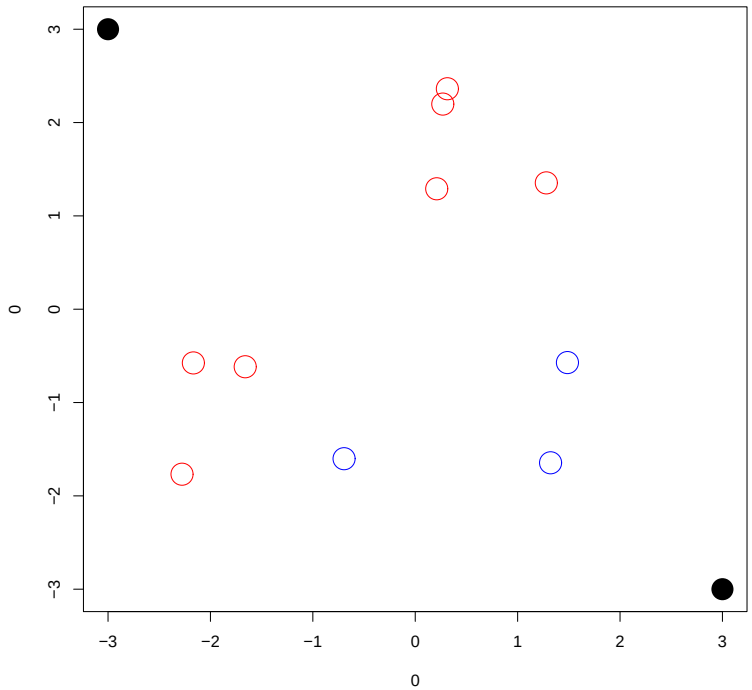


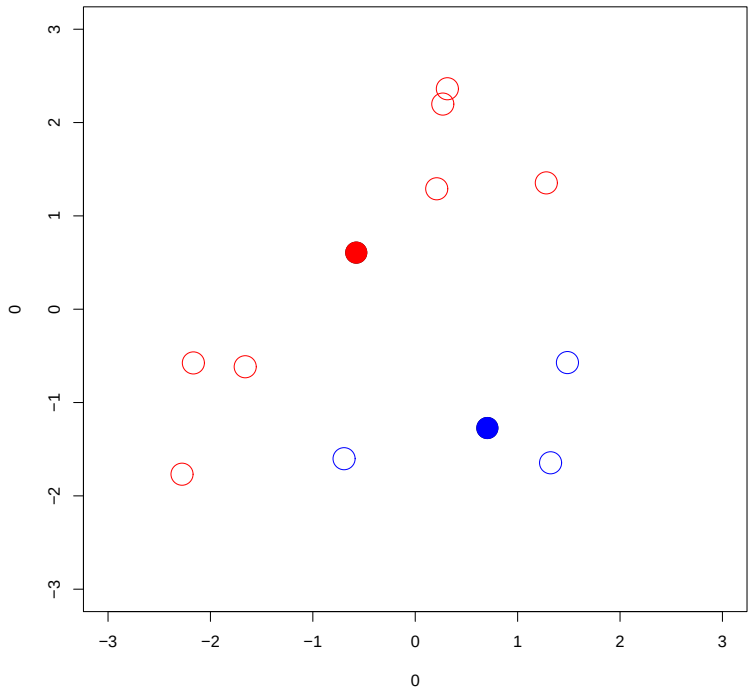
Initial 2

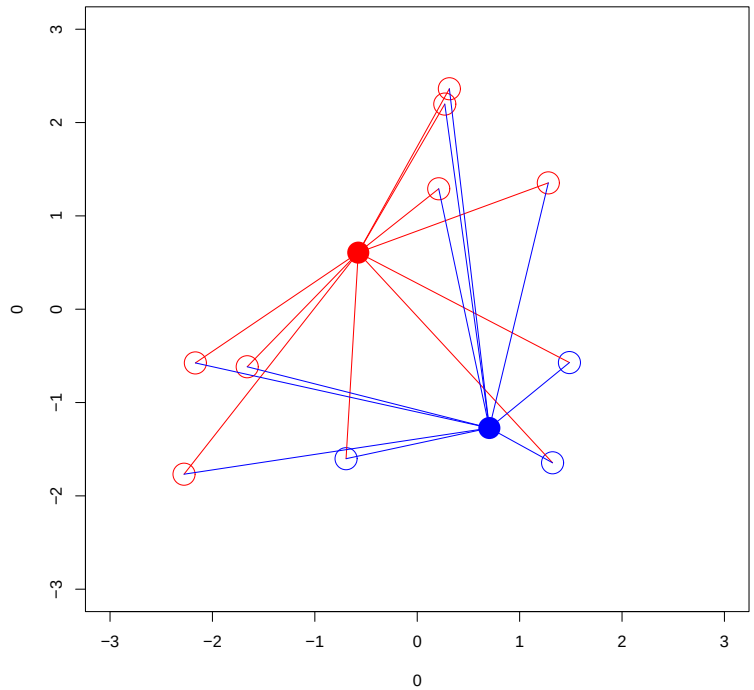


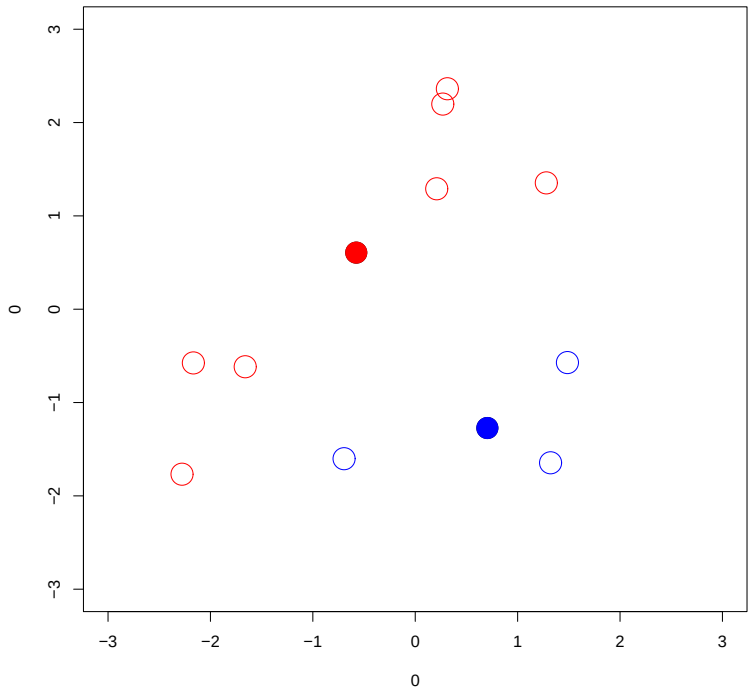




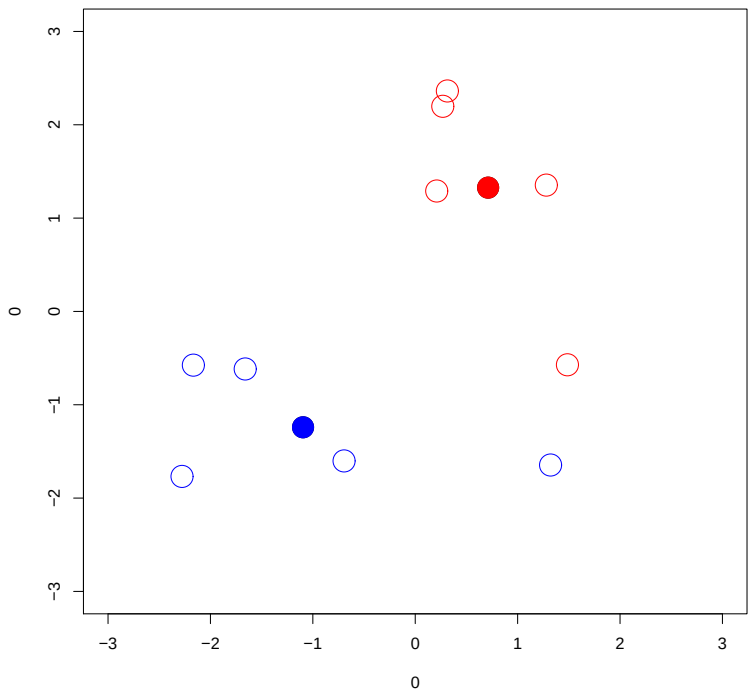




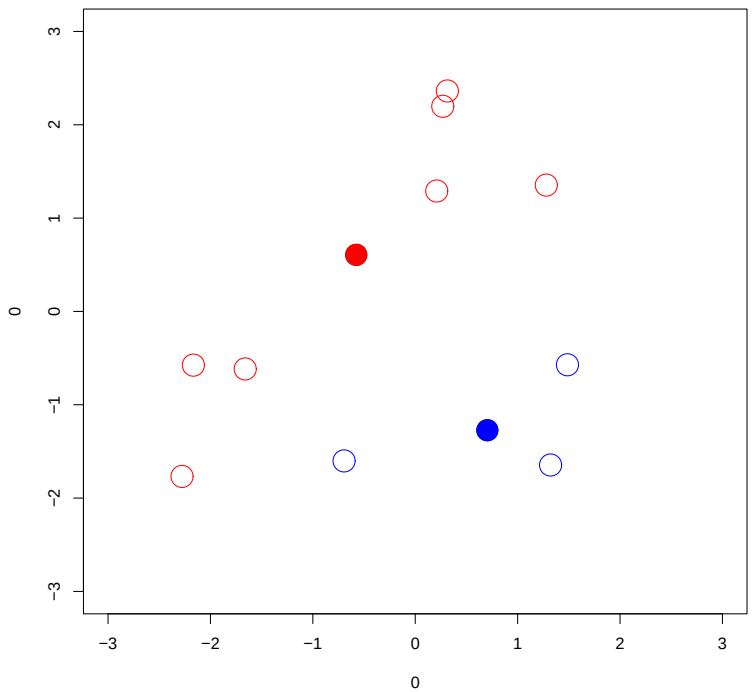




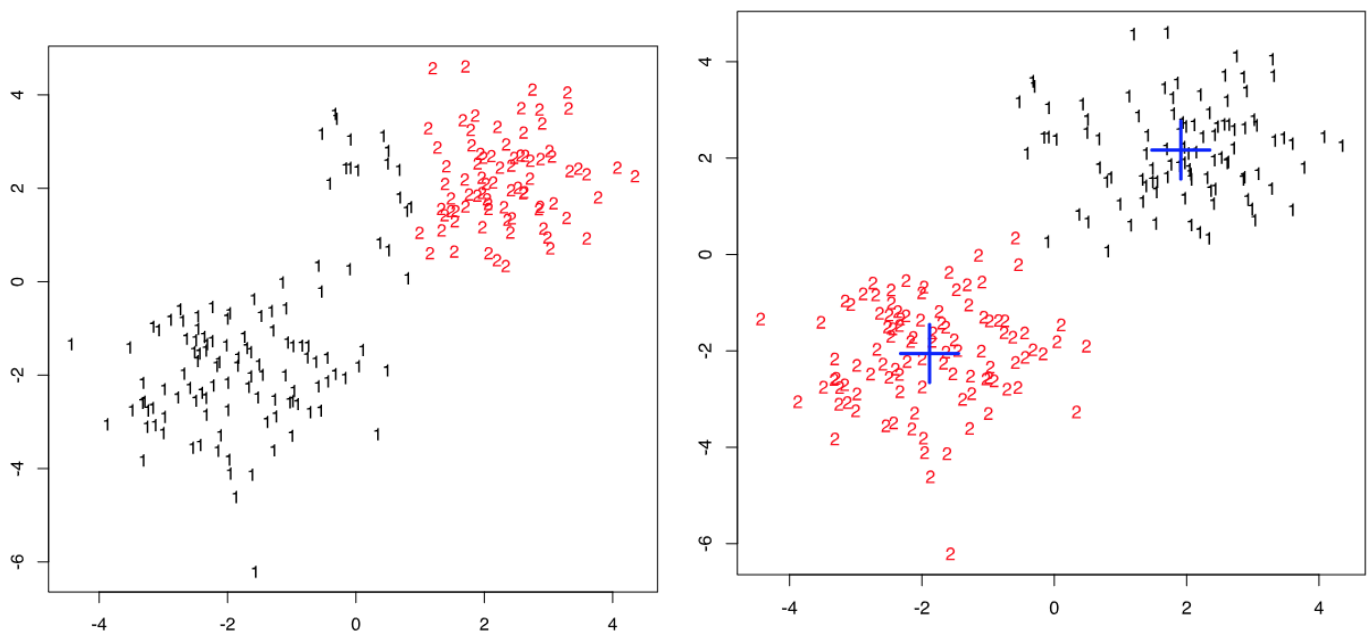
Compare 1



Compare 2



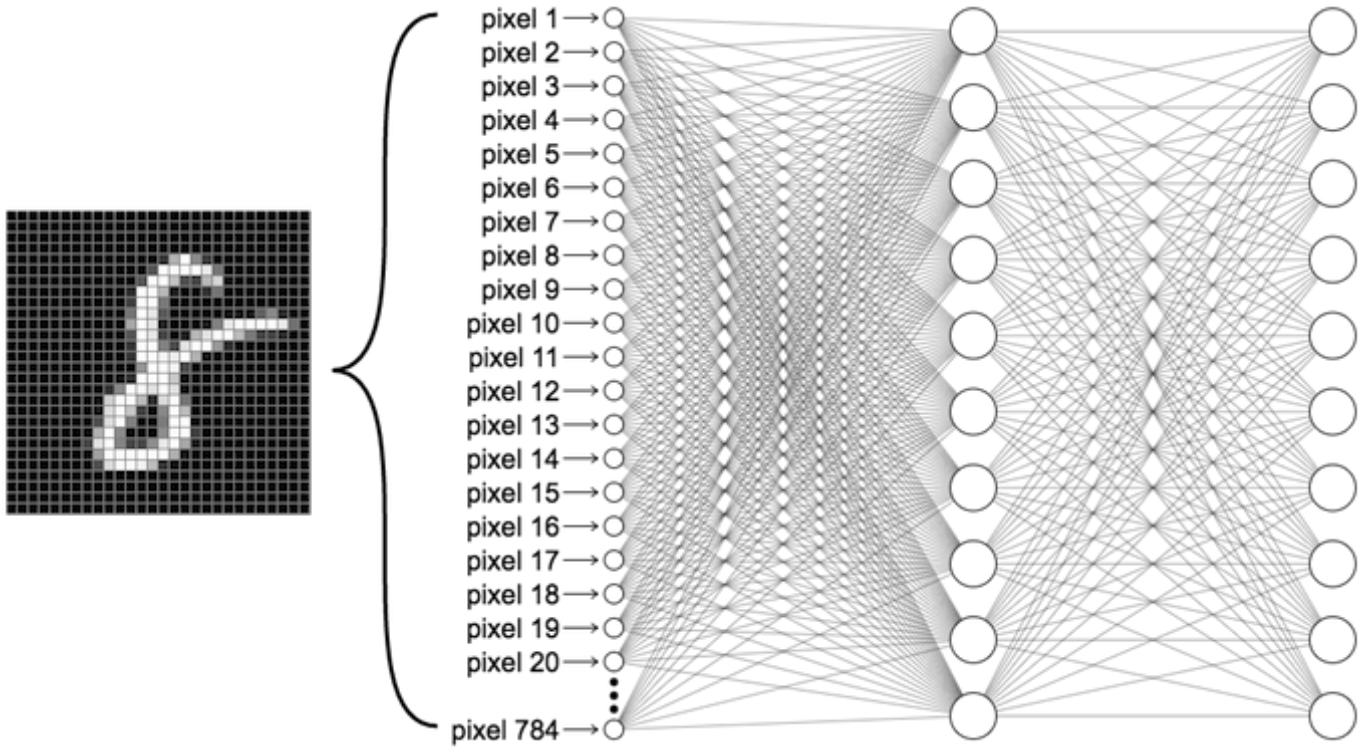
Code: K-Means on Simulated Data



Chapter 04

http://playground.tensorflow.org/
http://scs.ryerson.ca/~aharley/vis/fc/

Code: MNIST Data



Thank You