

Machine Learning

Vahid Partovi Nia

R Montreal 2018

July 4, 2018

**POLYTECHNIQUE
MONTREAL**



HUAWEI

Chapter 01

Chapter 02

Chapter 03

Chapter 04

① Chapter 01
Continuous Response
Discrete Response

② Chapter 02

③ Chapter 03

④ Chapter 04

Chapter 01

Chapter 02

Chapter 03

Chapter 04

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

Chapter 01

Chapter 02

Chapter 03

Chapter 04

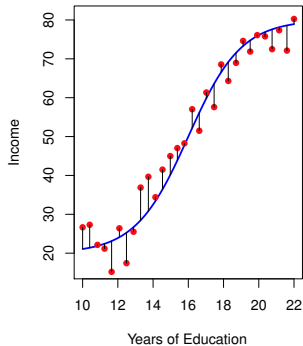
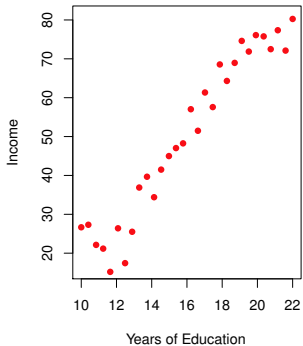
Chapter 01

Chapter 01

Chapter 02

Chapter 03

Chapter 04



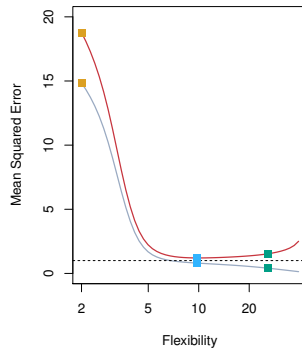
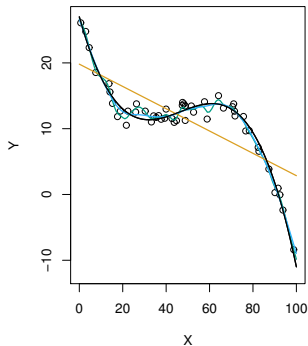
Train versus Test

Chapter 01

Chapter 02

Chapter 03

Chapter 04

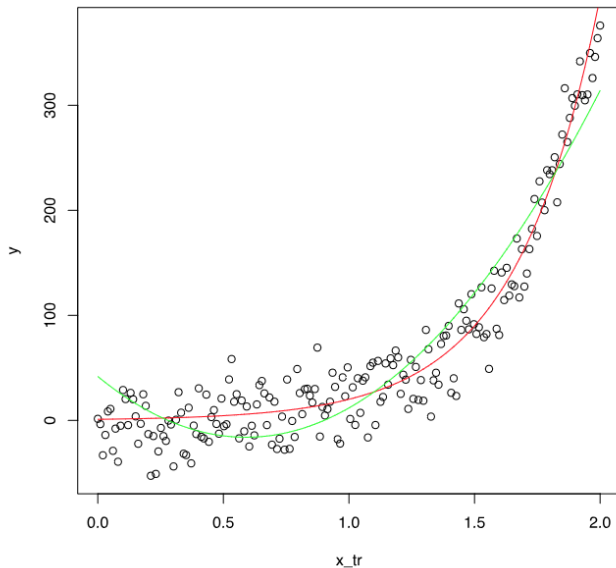


Chapter 01

Chapter 02

Chapter 03

Chapter 04

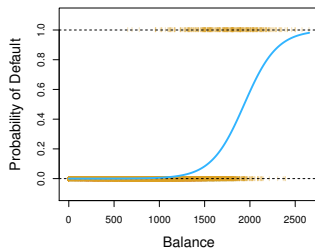
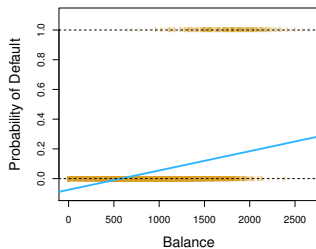


Chapter 01

Chapter 02

Chapter 03

Chapter 04



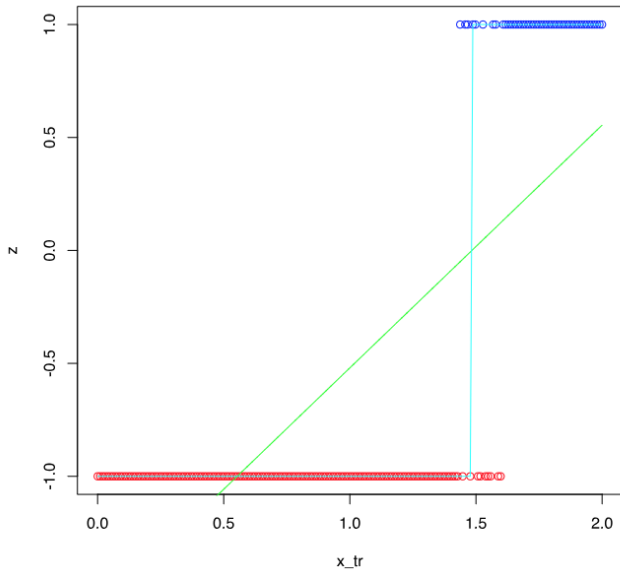
Code: Binary transform

Chapter 01

Chapter 02

Chapter 03

Chapter 04



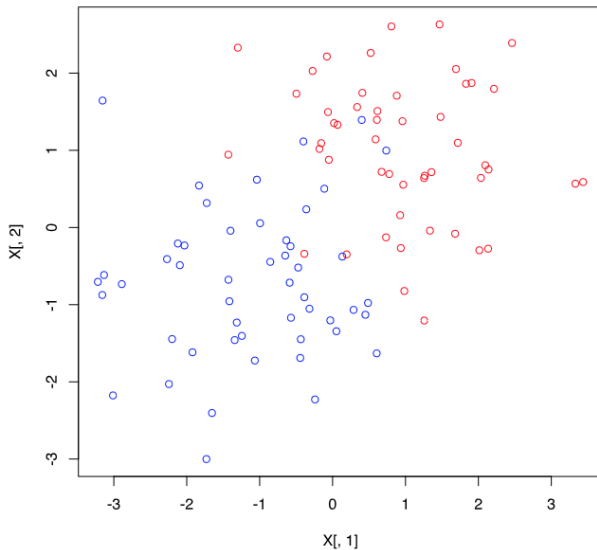
Code: Two-dimensional

Chapter 01

Chapter 02

Chapter 03

Chapter 04



Chapter 01

Chapter 02

Chapter 03

Chapter 04

Chapter 02

Chapter 01

Chapter 02

Chapter 03

Chapter 04



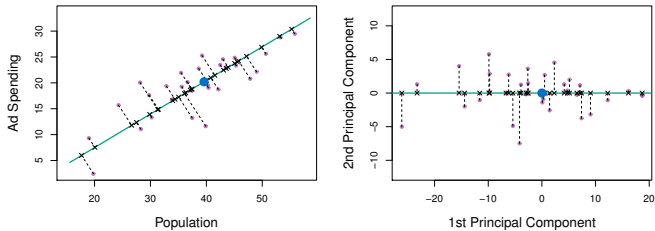
Principal Components

Chapter 01

Chapter 02

Chapter 03

Chapter 04



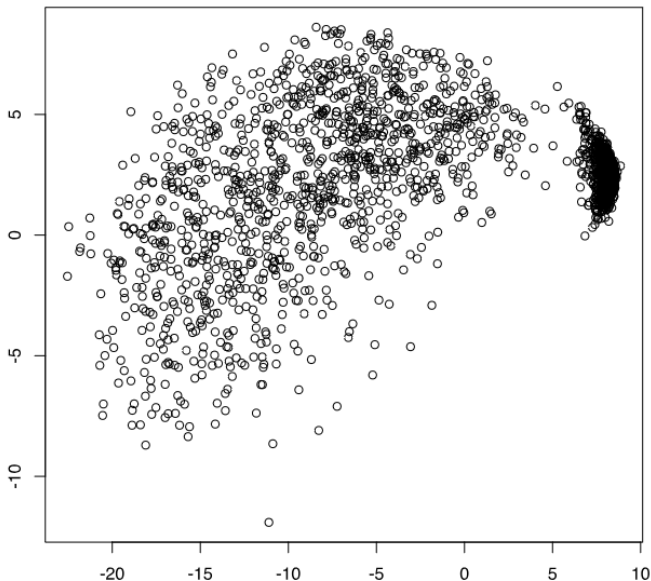
Code: PC on 0 1 digits

Chapter 01

Chapter 02

Chapter 03

Chapter 04



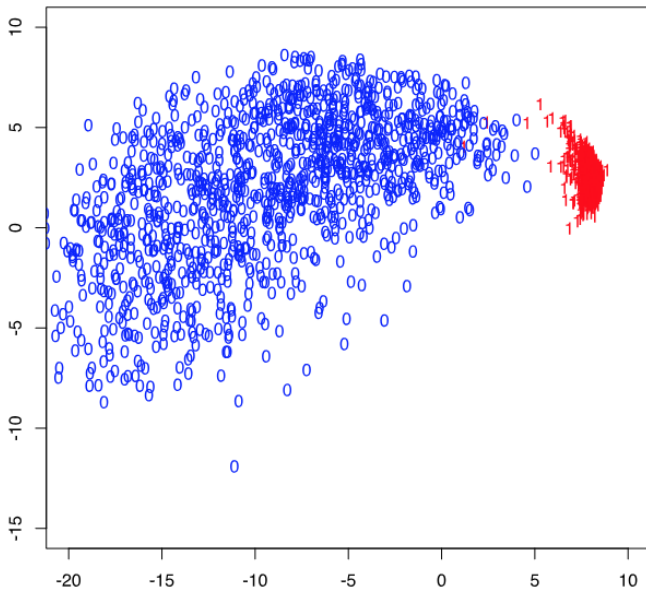
Code: PC on 0 1 digits

Chapter 01

Chapter 02

Chapter 03

Chapter 04



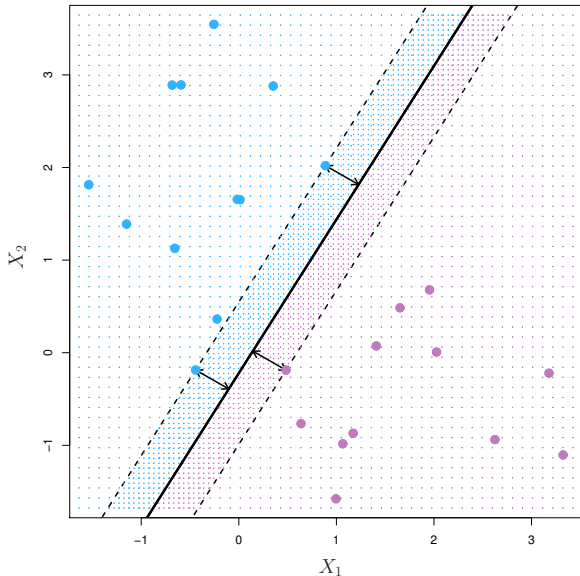
Support vector machines

Chapter 01

Chapter 02

Chapter 03

Chapter 04



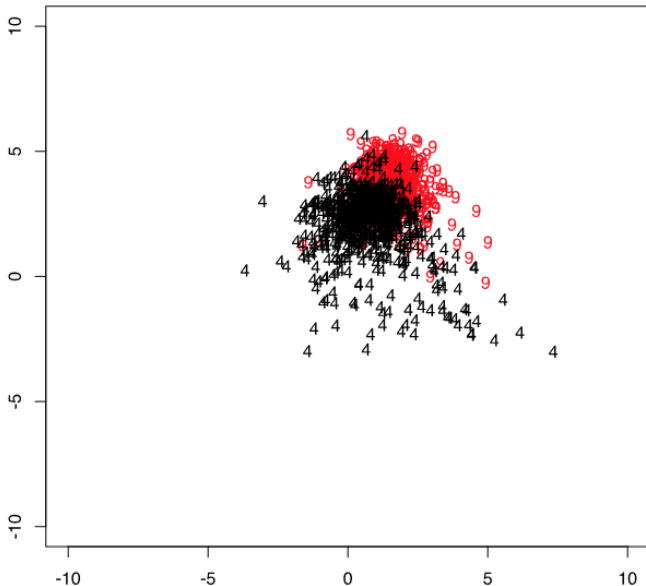
Code: SVM on digits 4 9

Chapter 01

Chapter 02

Chapter 03

Chapter 04

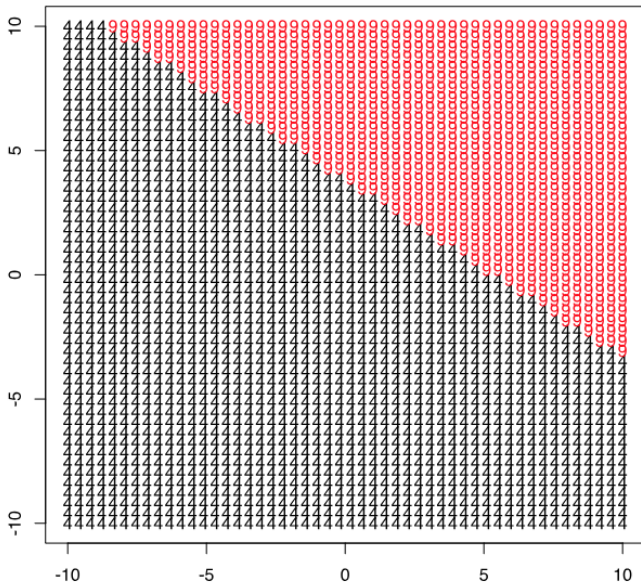


Chapter 01

Chapter 02

Chapter 03

Chapter 04



Chapter 01

Chapter 02

Chapter 03

Chapter 04



Chapter 01

Chapter 02

Chapter 03

Chapter 04

Chapter 03

Chapter 01

Chapter 02

Chapter 03

Chapter 04

Dendrogram

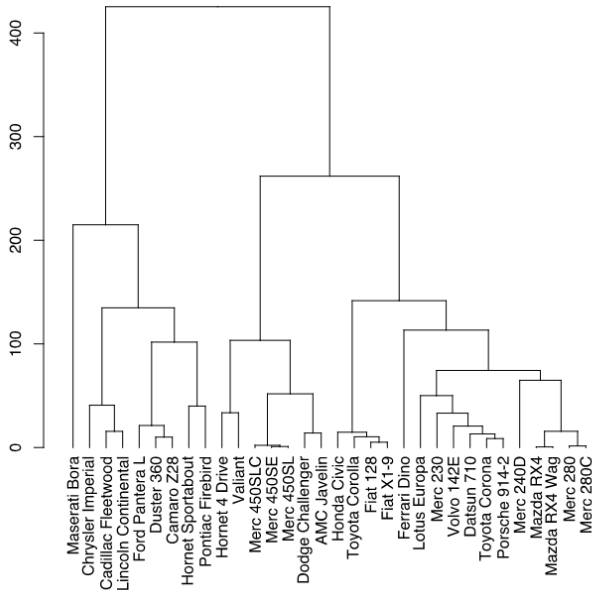
Hierarchical Clustering

Chapter 01

Chapter 02

Chapter 03

Chapter 04



Direction: Agglomerative or Divisive

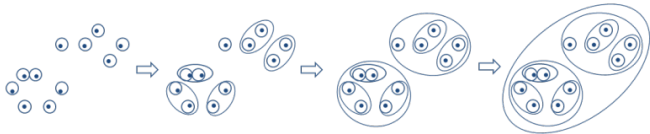
Chapter 01

Chapter 02

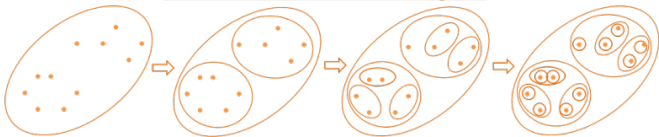
Chapter 03

Chapter 04

Agglomerative Hierarchical Clustering



Divisive Hierarchical Clustering

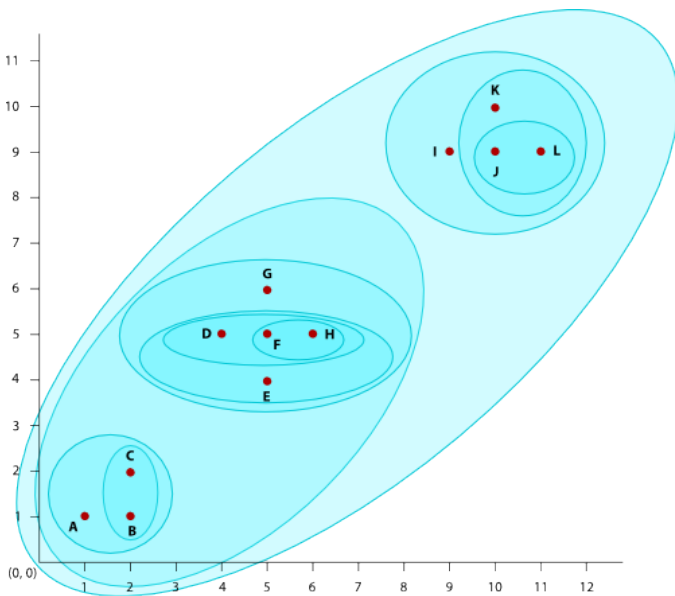


Chapter 01

Chapter 02

Chapter 03

Chapter 04



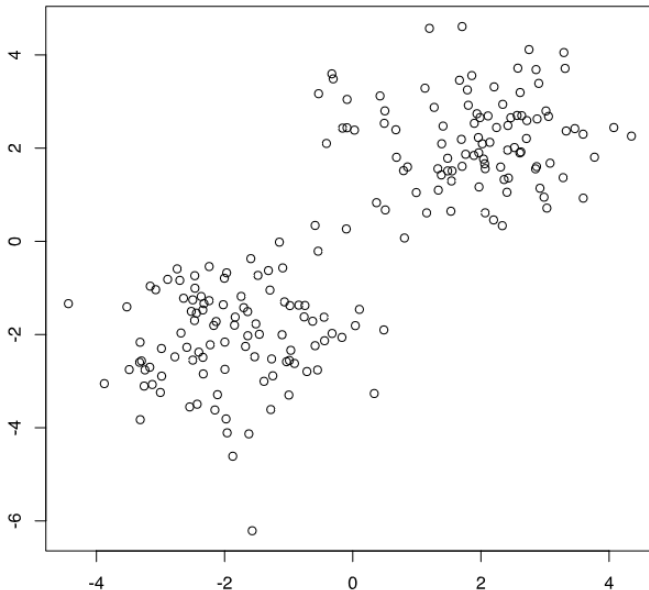
Code: Simulated Data

Chapter 01

Chapter 02

Chapter 03

Chapter 04



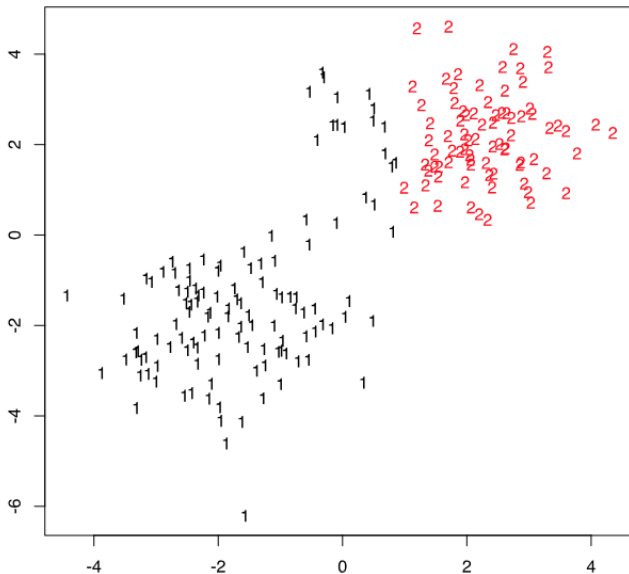
Code: Simulated Data

Chapter 01

Chapter 02

Chapter 03

Chapter 04



Chapter 01

Chapter 02

Chapter 03

Chapter 04

K-Means

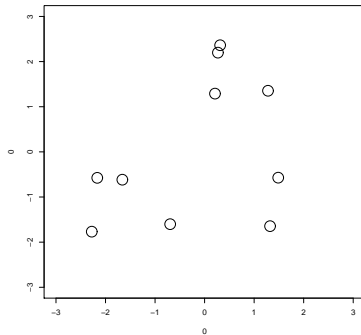
K-Means Initial 1

Chapter 01

Chapter 02

Chapter 03

Chapter 04

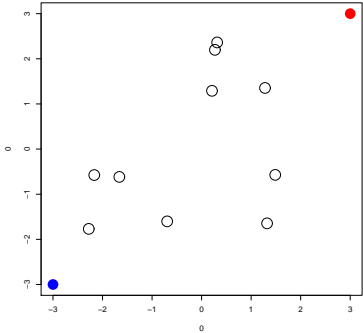


Chapter 01

Chapter 02

Chapter 03

Chapter 04

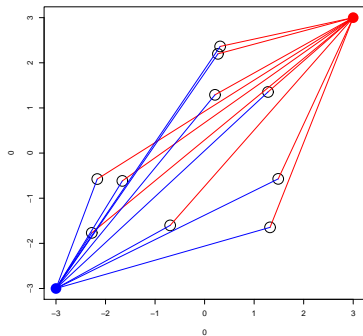


Chapter 01

Chapter 02

Chapter 03

Chapter 04

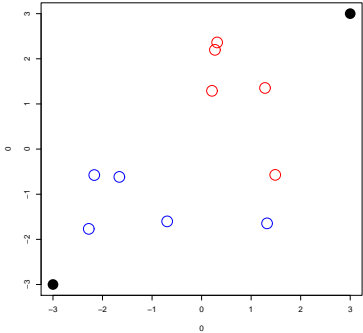


Chapter 01

Chapter 02

Chapter 03

Chapter 04

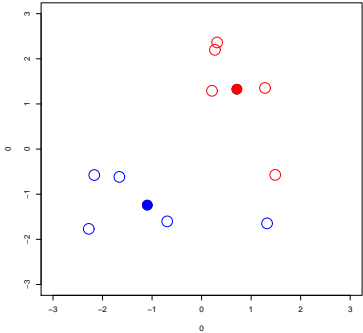


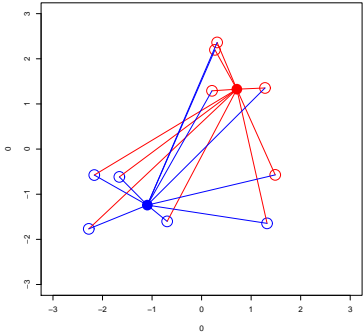
Chapter 01

Chapter 02

Chapter 03

Chapter 04



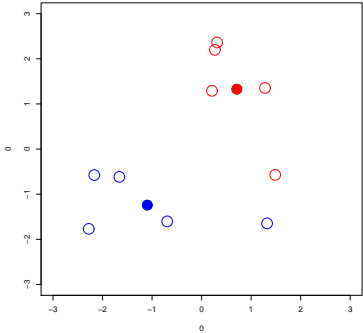


Chapter 01

Chapter 02

Chapter 03

Chapter 04

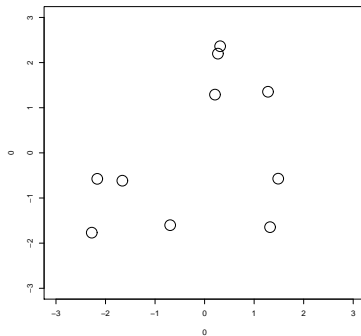


Chapter 01

Chapter 02

Chapter 03

Chapter 04

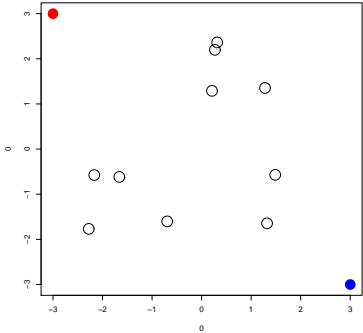


Chapter 01

Chapter 02

Chapter 03

Chapter 04

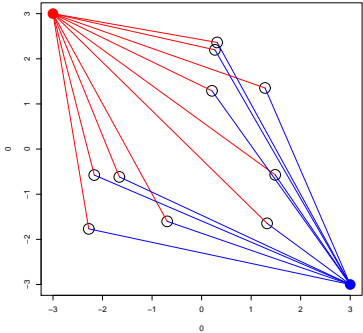


Chapter 01

Chapter 02

Chapter 03

Chapter 04

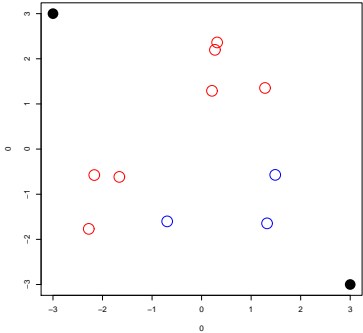


Chapter 01

Chapter 02

Chapter 03

Chapter 04

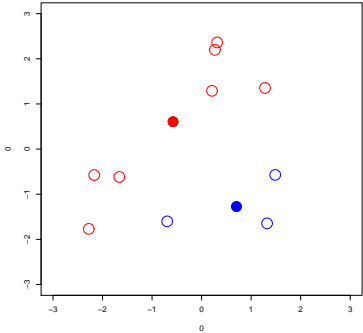


Chapter 01

Chapter 02

Chapter 03

Chapter 04

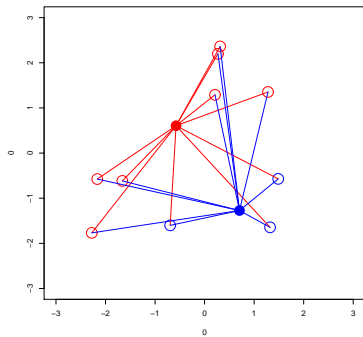


Chapter 01

Chapter 02

Chapter 03

Chapter 04

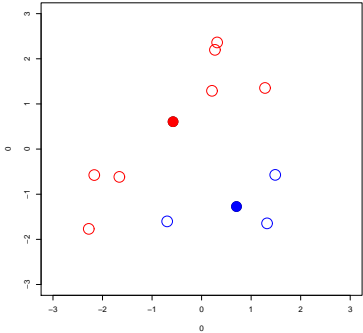


Chapter 01

Chapter 02

Chapter 03

Chapter 04



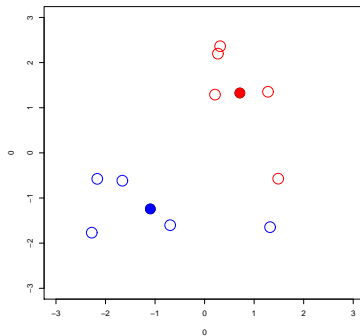
Compare 1

Chapter 01

Chapter 02

Chapter 03

Chapter 04

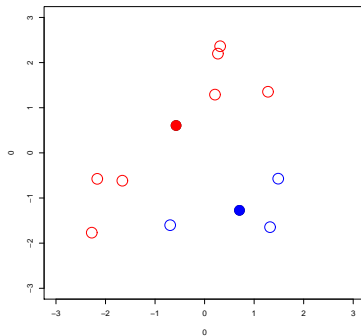


Chapter 01

Chapter 02

Chapter 03

Chapter 04



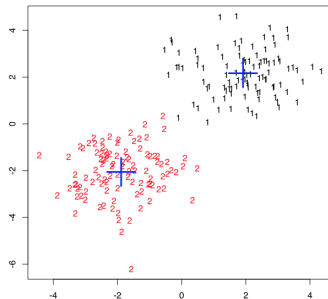
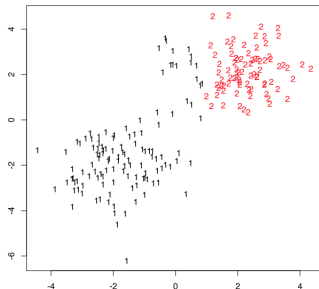
Code: K-Means on Simulated Data

Chapter 01

Chapter 02

Chapter 03

Chapter 04



Chapter 01

Chapter 02

Chapter 03

Chapter 04

Chapter 04

Chapter 01

Chapter 02

Chapter 03

Chapter 04

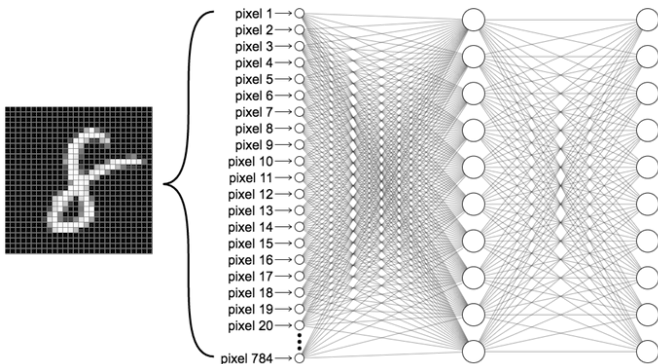
<http://playground.tensorflow.org/>
<http://scs.ryerson.ca/~aharley/vis/fc/>

Chapter 01

Chapter 02

Chapter 03

Chapter 04



Chapter 01

Chapter 02

Chapter 03

Chapter 04

Thank You