Multivariate Analysis for the Behavioral Sciences, Second Edition (Chapman and Hall/CRC, 2019)

Exercises of Chapter 12: Multivariate Data and Multivariate Analysis

Kimmo Vehkalahti and Brian S. Everitt

28 November 2018

Exercises

Exercise 12.1

Use the body data, modifying the related R code given in the **Examples of Chapter 12** (and other chapters).

```
body <- structure(list(
  Chest = c(34, 37, 38, 36, 38, 43, 40, 38, 40, 41, 36, 36, 34, 33, 36, 37, 34, 36, 38, 35),
  Waist = c(30, 32, 30, 33, 29, 32, 33, 30, 30, 32, 24, 25, 24, 22, 26, 26, 25, 26, 28, 23),
  Hips = c(32, 37, 36, 39, 33, 38, 42, 40, 37, 39, 35, 37, 37, 34, 38, 37, 38, 37, 40, 35)),
  .Names = c("Chest", "Waist", "Hips"), row.names = c(NA, -20L), class = "data.frame")
body
```

```
##    Chest Waist Hips
## 1     34    30   32
## 2     37    32   37
## 3     38    30   36
## 4     36    33   39
## 5     38    29   33
## 6     43    32   38
## 7     40    33   42
## 8     38    30   40
## 9     40    30   37
## 10    41    32   39
## 11    36    24   35
## 12    36    25   37
## 13    34    24   37
## 14    33    22   34
## 15    36    26   38
## 16    37    26   37
## 17    34    25   38
## 18    36    26   37
## 19    38    28   40
## 20    35    23   35
```

Exercise 12.2

Use the paint-sprayer data, modifying the related R code given in the **Examples of Chapter 12** (and other chapters).

Exercise 12.3

Use the life71 data, modifying the related R code given in the **Examples of Chapter 12** to visualize and analyse the data.

Source of the data: Keyfitz, N. and Flieger, W. (1971). *Population: The Facts and Methods of Demography.* W. H. Freeman, San Francisco, California.

```
life71 <- structure(list(

  m0 = c(63, 34, 38, 59, 56, 62, 50, 65, 56, 69, 65, 64, 56, 60, 61, 49,
         59, 63, 59, 65, 65, 64, 64, 67, 61, 68, 67, 65, 59, 58, 57),

  m25 = c(51, 29, 30, 42, 38, 44, 39, 44, 46, 47, 48, 50, 44, 44, 45, 40,
          42, 44, 44, 48, 48, 63, 43, 45, 40, 46, 45, 46, 43, 44, 46),

  m50 = c(30, 13, 17, 20, 18, 24, 20, 22, 24, 24, 26, 28, 25, 22, 22, 22,
          22, 23, 24, 28, 26, 21, 21, 23, 21, 23, 23, 24, 23, 24, 28),

  m75 = c(13, 5, 7, 6, 7, 7, 7, 7, 11, 8, 9, 11, 10, 6, 8, 9, 6, 8, 8, 14,
          9, 7, 6, 8, 10, 8, 8, 9, 10, 9, 9),

  w0 = c(67, 38, 38, 64, 62, 69, 55, 72, 63, 75, 68, 66, 61, 65, 65, 51,
         61, 67, 63, 68, 67, 68, 68, 74, 67, 75, 74, 71, 66, 62, 60),

  w25 = c(54, 32, 34, 46, 46, 50, 43, 50, 54, 53, 50, 51, 48, 45, 49, 41, 43,
        48, 46, 51, 49, 47, 47, 51, 46, 52, 51, 51, 49, 47, 49),

  w50 = c(34, 17, 20, 25, 25, 28, 23, 27, 33, 29, 27, 29, 27, 25, 27, 23, 22,
        26, 25, 29, 27, 25, 24, 28, 25, 29, 28, 28, 27, 25, 28),

  w75 = c(15, 6, 7, 8, 10, 14, 8, 9, 19, 10, 10, 11, 12, 9, 10, 8, 7, 9, 8,
        13, 10, 9, 8, 10, 11, 10, 10, 10, 12, 10, 11)),

  class = "data.frame", .Names = c("m0", "m25", "m50", "m75", "w0", "w25", "w50", "w75"),

  row.names = c("Algeria", "Cameroon", "Madagascar", "Mauritius", "Reunion",
                "Seychelles", "South Africa(C)", "South Africa(W)", "Tunisia",
                "Canada", "Costa Rica", "Dominican Rep", "El Salvador", "Greenland",
                "Grenada", "Guatemala", "Honduras", "Jamaica", "Mexico", "Nicaragua",
                "Panama", "Trinidad(62)", "Trinidad (67)", "United States (66)",
                "United States (NW66)", "United States (W66)", "United States (67)",
                "Argentina", "Chile", "Columbia", "Ecuador"))
```