

Data analysis and Exploration using

Dimensionality reduction

Introduction to R

Code Editor

R console Terminal

The screenshot displays the RStudio IDE interface. The top-left pane shows a script editor with the following R code:

```
1 library(FactoMineR)
2 library(Factoshiny)
3
4 data(decathlon)
5
6 res = Factoshiny(decathlon)
7
8
9
10
```

The top-right pane shows the Environment pane with the following data:

Variable	Value
x	41 obs. of 13 variables
activeindPCAshiny	"black"
axe1PCAshiny	1
axe2PCAshiny	2
categPCAshiny	"magenta"
color_arrowInit	"active/supplementary"
color_pointInit	"active/supplementary"

The bottom-left pane shows the Console with the following output:

```
R 4.3.3 ~ /
> library(Factoshiny)
> data(decathlon)
> res = Factoshiny(decathlon)

Listening on http://127.0.0.1:6422

Listening on http://127.0.0.1:6422
Warning: Computation failed in `stat_bin()`.
Caused by error in `bin_breaks_bins()`:
! `bins` must be a whole number, not the number 8.2.

>
```

Environment Variables History

Plots Help Files

R: Introduction

- Install and load library

```
> install.packages("ggplot2") # Install new library  
> library(ggplot2) # Load library
```

- Visualise documentation for a function or library

```
> ?mean # or help(mean)  
> help("PCA", package = "FactoMineR")  
> example(mean)
```

- Load preloaded datasets

```
> data(cars)  
> library(help = "datasets")  
> view(cars)
```

R: Data Frames

A data frame is a table of data in R:

- each row = one individual (or observation),
- each column = one variable (or attribute),
- columns can be of different types (numeric, text, factor, etc.).

```
> class(cars)
> is.data.frame(cars)
```

```
> df = data.frame(
  Nom = c("Alice", "Bob", "Clara"),
  Age = c(23, 25, 22),
  Sexe = c("F", "M", "F")
)
```

R: Manipulate Data Frames

```
> head(cars)

> summary(cars)

> head(mtcars)

> names(mtcars) # Show column names

> mtcars$hp <- NULL # Delete a column

> mtcars <- mtcars[-2,] # Delete a row

> mtcars$new_var <- 1:nrow(mtcars) # Add a column
```

R: Read csv

- Example of csv file

```
Name; City; Sallary; Year
Alpha; Paris; 22000; 2023
Beta; Lyon; 69500; 2023
Gamma; Marseille; 33400; 2023
Delta; Paris; 12000; 2024
```

- Read csv file

```
data <- read.csv("ventes.csv", sep = ";", dec = ".", header = TRUE, row.names = 1)
```

Delimiter
(eg. , or \t or ;)

Decimal
separator
(. or ,)

Whether the first
line is columns
names

Use first column
as index