R Statistical computing

CONCEPTS

> Almost everything is a vector; a single number is a vector of length 1. Operations work on whole vectors at once.

Vector one type
↓ `names + dims`
List mixed types
↓ `equal-length columns`
Data frame table of columns
↓ `model / plot`
Result print or write

RUNNING R

`R`
Start an interactive session

`Rscript` *`<file.R>`* **`[args]`**
Run a script non-interactively

`Rscript -e '`*`<expr>`***`'`**
Evaluate an expression and exit

`R --vanilla`
Ignore profile, site and saved state

HELP AND PACKAGES

`?`*`<topic>`*
Open the help page for a function

`install.packages("`*`<pkg>`***`")`**
Install from CRAN

`library(`*`<pkg>`***`)`**
Attach an installed package

VECTORS

`c(1, 2, 3)`
Combine values into a vector

`1:10`
Integer sequence

`length(`*`<x>`***`)`**
Number of elements

`x[3]`
Third element

VECTORS (cont.)

`x[x > 5]`
Elements matching a condition

DATA STRUCTURES

`str(x)`
Compact structure of any object

DATA FRAMES

`head(df, `*`<n>`***`)`**
First rows

`summary(df)`
Per-column statistics

`df$`*`<col>`***
One column as a vector

`df[`*`<rows>`***`, `***`<cols>`***`]`**
Rows and columns by index or name

`df[df$`*`<col>`***` > 5, ]`**
Filter rows

CONTROL AND FUNCTIONS

`f ← function(x, y = 2) { x + y }`
Define a function

APPLY FAMILY

`sapply(x, f)`
Apply, simplify to vector or matrix

`lapply(x, f)`
Apply, always return a list

IMPORT AND EXPORT

`read.csv("`*`<file>`***`")`**
Read a CSV into a data frame

`write.csv(df, "`*`<file>`***`", row.names = FALSE)`**
Write a data frame as CSV

PLOTTING

`plot(x, y)`
Scatter plot