

# Introduction to R

Using R

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Hafro, 8 Nov 2010

## Outline

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## 1 Projects

### One root folder for all projects

e:/project

**2008** faroes

    schaefer

**2009** shrimp

    tuna

**2010** pan

**msc**

**unu**

In statistical computing, short paths without spaces are helpful:

- e:/project/msc/data/landings.dat

### Each project can be divided into four folders

**admin** documents related to the project

    proposal.doc, meetings.doc

**analysis** script.R, workspace.RData

    model.tpl, input.dat, output.rep

    overview.xls

**data** original.txt, original.csv

**report** manuscripts, slideshows, figures

## File types

**.R** R code (text file that can be pasted into R)

script, function (with # comments)

complex R object (list, factor w/levels)

**.RData** workspace

large R object

**.txt** data

**.csv**

**.dat**

## Load and save

**Workspace**      project.RData    bigobject.RData

load(file)

save(ls(), file)

save(bigobj, file)

**Code**            function.R      script.R      object.R

source(file)

dump(obj, file)

## Backup

### System backup

Hafro automatic backups on tape

### Revision control

Multiauthor projects (e.g. Gadget) are under revision control

### Directory backup

User makes a backup copy of a project directory: 'analysis.zip'

### File backup

User makes a backup copy of a file: 'script.old'

### Editor backup

Emacs can make automatic backups in a dedicated directory

### R backup

R can make automatic backups of '.RData' inside .Last()

## Backup

### Same disk

Undo mistakes, revisit old version

### External

Recover from catastrophes (disk failure, stolen laptop)

## 2 Packages

### Using packages

`find("function")`

`search()`

`library()`

`library(pkg)`

`ls("package:pkg")`

`install.packages("pkg")`

`update.packages()`

### Core packages

**base** data objects, input/output, maths, etc.

**datasets** example datasets

**graphics** traditional plots

**lattice** trellis plots

**stats** statistical models and tests

### Hafro packages

**geo** draw maps

**fjlst** survey data

**Logbooks** logbook data

**ROracleUI** Oracle queries

### The gdata package

`Args(fun)` show function args, similar to `args(fun)`

`env()` show all environments, similar to `search()`

`is.what(obj)` show all 'is.\*()' test results

`ll()` show all objects in workspace, similar to `ls()`

`ll(obj)` show all elements of a list, or columns in data frame, similar to `names(obj)`

`keep(obj)` remove all objects in workspace, except `obj`

## CRAN package repository

When you type

```
install.packages("pkg")
```

R downloads the package from CRAN

<http://cran.r-project.org>

main package repository (> 2600 packages)

use mirror: Scandinavia, UK, Ireland

<http://cran.r-project.org/web/views/>

<http://crantastic.org>

browse packages by topic and maintainer, with reviews

## 3 Scripts

### Editing scripts and functions

**R** plain and simple

no extra packages

optional script window

**Editors** syntax highlighting

closing parentheses and strings

efficient text editing, keybindings, regexp

handle many scripts, recent files, etc.

**IDE** send code to R

features for writing R packages

many editors have optional R add-on

e.g. Emacs, Tinn-R, Eclipse

### history

```
history()
```

```
history(Inf)
```

### source

```
source("script.R")
```

Runs everything in the `script.R` file

Like copying everything from the script into the R window

## 4 Help

### Help pages

Structured web pages with links

**Arguments** things that determine the function output

**See Also** related functions

**Examples** code that can be copied from browser and pasted into R

### Help functions

```
args(log)
```

```
apropos("log")
```

```
help(log, help_type="html")
```

```
help(log)
```

```
?log
```

```
?["
```

```
help(package="pkg")
```

```
help.search("keyword")
```

```
??keyword
```

### Manuals

[An introduction to R](#) (official user manual)

```
http://mirrors.dotsrc.org/cran/doc/manuals/R-intro.pdf
```

[User-contributed tutorials](#)

```
http://mirrors.dotsrc.org/cran/other-docs.html
```

[FAQ](#)

```
http://mirrors.dotsrc.org/cran/doc/FAQ/R-FAQ.pdf
```

[Technical manuals](#)

```
http://mirrors.dotsrc.org/cran/manuals.html
```

### Source code

[View source code of an R function](#)

```
lm
```

```
logLik.lm
```

```
getAnywhere(logLik.lm)
```

[Browse the entire R source code](#)

```
http://svn.r-project.org/R/trunk/
```

[Download the entire R source code](#)

```
ftp://mirrors.dotsrc.org/cran/src/base/R-latest.tar.gz
```

```
$ svn co http://svn.r-project.org/R/trunk R
```

## Web search

### Normal web search

Your favorite search engine in a browser

### R web search

```
RSiteSearch("keyword")
```