The R Book

Chapter 1: Getting Started

Session 1

Installing R

CRAN (Comprehensive R Archive Network)

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

- ‘base’ package
- setup program, PC: R*.exe, Mac: R*.dmg

- Linux:

  sudo apt-get update

  sudo apt-get install r-base

Running R

''**>**'' prompt ‘What now?’ … type your commands here.

''**+**'' instead of ''>'' command incomplete, missing bracket, etc.

''**Esc or q**'' escape, command line prompt > will reappear

''**Up** arrow'' scroll through previous commands

''**left/right** arrow'' edit commands

Getting Help in R

Description of functions:
? ''function name'' for example: ?read.table

… if you do not remember the function name

help.search("data input")
→ proposes adequate function names

find and apropos

find("term") (finds the package something is in)
 for example: find("lowess")

apropos("term") (finds search terms in objects)
For example: apropos("lm")

A variety of R manuals …

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

- **An Introduction to R** *gives an introduction to the language and how to use R for doing statistical analysis and graphics.*

- **A draft of the R Language Definition** documents the language per se – that is, the objects that it works on, and the details of the expression evaluation process, which are useful to know when programming R functions.

- **Writing R Extensions** *covers how to create your own packages, write R help files, and use the foreign language (C, C++ , Fortran, ...) interfaces.*

- **R Data Import/Export** *describes the import and export facilities available either in R itself or via packages which are available from CRAN.*

- **R Installation and Administration**, *which is self-explanatory.*

- **R: A Language and Environment for Statistical Computing** *(referred to on the website as 'The R Reference Index') contains all the help files of the R standard and recommended packages in printable form.*

Worked Examples of Functions

... for example type:

example(lm) graphical output produced by the lm function.

demo(persp)

demo(graphics)

demo(Hershey)

demo(plotmath)

Libraries in R to incorporate add on packages

library(spatial)

Examples

lattice
lattice graphics for panel plots or trellis graphs

MASS
package associated with Venables and Ripley's book entitled Modern Applied Statistics using S-PLUS

mgcv
generalized additive models

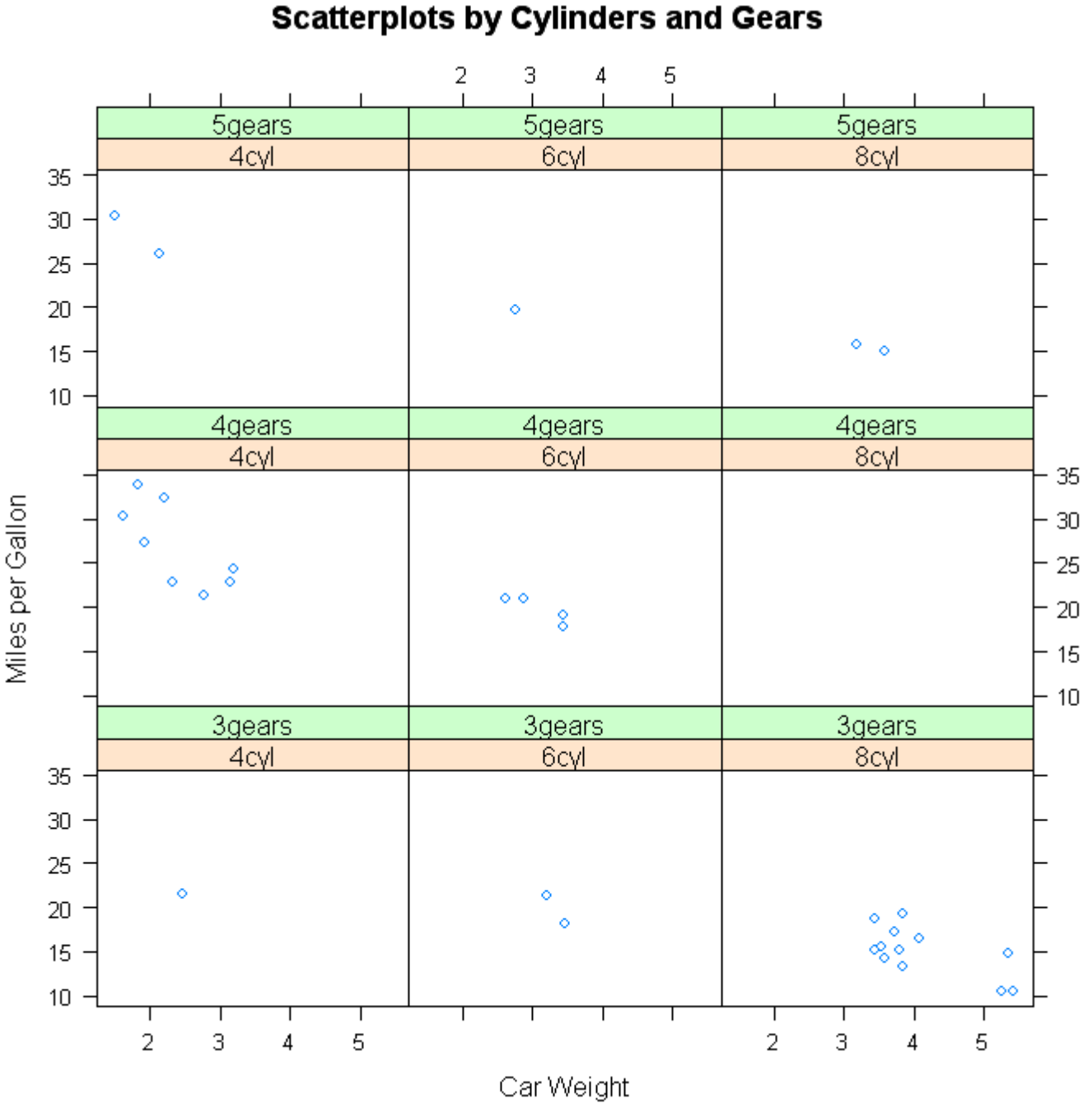
nlme
mixed-effects models (both linear and non-linear)

nnet
feed-forward neural networks and multinomial log-linear models

spatial
functions for kriging and point pattern analysis

survival
survival analysis, including penalised likelihood

Example for Trellis graphs



Contents of Libraries

library(help=spatial)
Use the help function to discover the contents of library packages

objects with search()
View full list of the contents of a library
→ objects with search()

For example: **objects(grep("spatial",search()))**

Then, to find out about functions … ? ''function name''

For example: **?Kfn**

Installing Packages and Libraries

Use the install.packages function,
we will need the following packages throughout the book

```
install.packages("akima")
install.packages("chron")
install.packages("lme4")
install.packages("mcmc")
install.packages("odesolve")
install.packages("spdep")
install.packages("spatstat")
install.packages("tree")
```

Other packages on CRAN

Command Line versus Scripts

For multi-line input, a text editor is recommended.

- gedit
- Word
- RGui for mac
- Rstudio for linux, Mac, PC, www.rstudio.org

Data Editor

Upload, edit tables, input data

Data input, command line: read.table()

Good Housekeeping

To see what variables you have created in the current session,
objects()

To see which libraries and dataframes are attached:
search()

Tidying Up

At the end of a session in R,

remove (rm) variables names you have created
(for example x <-5.6)
rm(x,y,z)

detach any dataframes you have attached
detach(worms)

To get rid of everything,
rm(list=ls())