

Using R for Statistics practical work: Statistics 2 edition

Introduction

This document gives general information about logging on to the system and accessing the R system.

1 Accessing R on the Mathematics PC's

To access **R**, first log on to a Windows PC in the computer lab. You should have already been given a userid and password.

To start **R** go to the **Start** button (bottom left of screen), left click on it, go up and move the mouse onto **Programs** and drag the mouse right to pull up the programs menu. Click on the **R1.5.1** item. After starting you will see a large window containing a smaller window: the *R console*. You type all the commands into this window; other windows may appear during the course of your session.

Note that you can repeat and edit previous commands by using the up- and down-arrow keys. Most questions that you have about **R** can be answered by pulling down the **help** menu.

To exit **R** either type `q()` in the commands window or select **Exit** on the **File** menu. You will be asked if you wish to save the 'workspace image': a 'no' answer is appropriate unless you have created some objects that you wish to use again. Do not forget to log-off (by typing `ctrl-alt-delete`, and then the `logoff` button).

2 Getting help with R

A lot of **online** help is available. In particular, for instructions on how to use a particular function, select **Help | R language** and for a long discussion of general issues, follow **Help | Manuals | An Introduction to R**.

3 Statistics 2 unit

The datasets for use in this unit are accessible by typing

```
attach('//giants/R/stats2.RData')
```

4 Using your own PC

A big advantage of R over Splus is that you can get a copy of it for free. Links to sites where you can download R and documentation for R can be found at

```
http://www.stats.bris.ac.uk/~peter/R/
```

Having done so, you can download the `stats2.RData` workspace mentioned above from

```
http://www.stats.bris.ac.uk/~peter/Teach/s2.html
```

onto your own computer (say in `c:\prac\stats2.RData`) and then typing `attach('c:/prac/stats2.RData')` within **R**.

5 A practice session with R

The **R** system is a sophisticated interactive package for statistics and graphics, with its own programming language built in. There should be no need to learn this language formally, as it works quite intuitively. The following practice session is intended to introduce you to the main ideas. Try typing these instructions (in order, down the columns) and observing the resulting output. If you do not see what is going on, experiment by varying the input a little to see the effect. In very broad terms, **R** is like a powerful calculator. If you type an expression, it is evaluated; the result is then printed, unless it is assigned to a variable. Assignment (corresponding to = in Fortran or C) is achieved using <=.

```
2*3
z<-2*3
z
a<-c(1,7,4,5)
a[2]
a[2:4]
a[c(3,3,2)]
a[-2]
b<-1:4
a+b
a*b
a%*%b
m<-matrix(1:12,3,4)
m
m[2,c(1,3)]
nrow(m)
m^2
log(m)
m%*%a

sort(a)
sum(a)/length(a)
sample(17)
sample(10,5)
rnorm(20)
z<-rnorm(20)
mean(z)
var(z)
median(z)
stem(rnorm(20))
x<-6*pi*(0:200)/200
plot(x,exp(-0.09*x)*sin(x))
plot(cumsum(runif(200))/(1:200))
x<-1:10
y<-3.4+1.2*x+rnorm(10)
plot(x,y)
abline(3.4,1.2,lty=2)
abline(lsfite(x,y))
hist(rgamma(500,2))
```

If you cannot understand what any of the functions above does, try the **R** help system.