Introduction

A first session

```
> x<-rnorm(100)
> head(x)
[1] -0.2596588 -0.5439287 -0.3976459 -0.8051366 -0.8854298
[6] -0.1317834
> mean(x)
[1] 0.04613127
> sd(x)
[1] 1.013185
> min(x)
[1] -3.207916
> max(x)
[1] 2.550923
```

R as a calculator

Basic operations

```
> 2+2
[1] 4
> 7*17
[1] 119
> sqrt(9)
[1] 3
> 3^3
[1] 27
> log(7)
[1] 1.94591
> log10(7)
[1] 0.845098
```

Precision

```
> sin(pi/2)
[1] 1
> pi
[1] 3.141593
> options(digits=22)
> pi
[1] 3.1415926535897931
```

Infinity or not defined, and missings

```
> 1/0
[1] Inf
> 2*Inf
[1] Inf
> -1/0
[1] -Inf
> 0/0
[1] NaN
> c(1,2,3,NA,5)
[1]  1  2  3 NA  5
> mean(c(1,2,3,NA,5))
[1] NA
```

Assignments to variables

```
> x <- 5
> x
[1] 5
> # x=5 can be used; not recommended
> x*x
[1] 25
> y <- x+5
> ls()
[1] "x" "y"
> rm(x)
> ls()
[1] "y"
```

Getting help

Different sources

- The internal help functions
- Manuals
- Cheat sheets
- Mailing lists
- Google
- http://stackoverflow.com/
- Books
- Local **R** users

Internal help function

- If we know what function we need help with, then type:
  ```
  > ?mean      # shorthand for help(mean)
  ```
- If we just want to see an example
  ```
  > example(mean)
  ```
- Often we don't know exactly what we are looking for
  ```
  > ??"fitting linear model"   # shorthand for
  >                            # help.search("fitting linear model")
  ```

Manuals

- Available on-line `http://www.r-project.org`, but main ones are also part of the installation, type:
  > `help.start()`
- "An Introduction to R" and "R Data Import/Export" are worth looking at.

Cheat sheet

- May be useful to mount near you desk when starting with **R**
- Several can be found at http://cran.r-project.org/other-docs.html

Mailing lists

- **R** has an extremely active user base.
- The mailing lists are very helpful, you can access many at
  `https://www.r-project.org/mail.html`... but users prefer that you
  read and think before you pose questions.
- Also they easily smell if you are asking for an answer to a homework
  question.
- The archive is a goldmine of knowledge
  `http://tolstoy.newcastle.edu.au/R/`.

Do you know stack overflow?

- Main site at: http://stackoverflow.com/
- Find 'tags' and **R**
- The rating often gives you a high quality answer
- Example http://stackoverflow.com/questions/9508518/why-are-these-numbers-not-equal

Books

- There are many
- Here is a list of 150 **R** –books:
  `http://www.r-project.org/doc/bib/R-books.html`
- Most are fairly specialized

Local R users

- By far the optimal source of information.
- Not only are they close by, but on top of explanations, they may even provide you with a piece of code that nearly does the job.
- Remember this when someones comes to you for R help.