

Lecture 1

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What is R? Why R?

Wiki:

R is a programming language and software environment for statistical computing and graphics.

- ▶ Widespread among statisticians
- ▶ A bunch of libraries
- ▶ Easy to learn
- ▶ A little overhead for doing statistics

Installing R

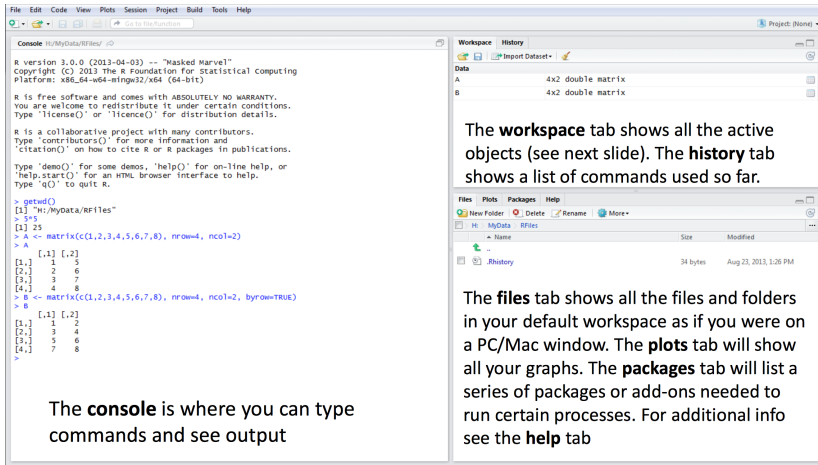
R: <http://www.r-project.org>

R Studio: <http://www.rstudio.com>

Literature

- ▶ R Quickguide: <http://cran.r-project.org/doc/contrib/Torfs+Brauer-Short-R-Intro.pdf>
- ▶ Stowell. Using R for Statistics, 2014
- ▶ Alain F. Zuur. A beginner's guide to R
- ▶ Eric D. Kolaczyk. Statistical analysis of Network Data with R

R Studio



The **console** is where you can type commands and see output

```
R version 3.0.0 (2013-04-03) -- "Masked Marvel"  
Copyright (c) 2013 The R Foundation for statistical computing  
Platform: x86_64-w64-mingw32/x64 (64-bit)  
  
R is free software and comes with ABSOLUTELY NO WARRANTY.  
You are welcome to redistribute it under certain conditions.  
Type 'license()' or 'licence()' for distribution details.  
  
R is a collaborative project with many contributors.  
Type 'contributors()' for more information and  
'citation()' on how to cite R or R packages in publications.  
  
Type 'demo()' for some demos, 'help()' for on-line help, or  
'help.start()' for an HTML browser interface to help.  
Type 'q()' to quit R.  
  
> getwd()  
[1] "H:/MyData/RFiles"  
> 5*5  
[1] 25  
> A <- matrix(c(1,2,3,4,5,6,7,8), nrow=4, ncol=2)  
> A  
      [,1] [,2]  
[1,]    1    5  
[2,]    2    6  
[3,]    3    7  
[4,]    4    8  
> B <- matrix(c(1,2,3,4,5,6,7,8), nrow=4, ncol=2, byrow=TRUE)  
> B  
      [,1] [,2]  
[1,]    1    2  
[2,]    3    4  
[3,]    5    6  
[4,]    7    8  
>
```

The **workspace** tab shows all the active objects (see next slide). The **history** tab shows a list of commands used so far.

The **files** tab shows all the files and folders in your default workspace as if you were on a PC/Mac window. The **plots** tab will show all your graphs. The **packages** tab will list a series of packages or add-ons needed to run certain processes. For additional info see the **help** tab

Different approaches

- ▶ Create full listing of code
- ▶ Type command-by-command in console

Installing libraries

- ▶ igraph

Something easy

```
10^2 + 36
```

```
## [1] 136
```

```
a = 4
```

```
a * 5
```

```
## [1] 20
```

Vectors

```
b = c(3,4,5)  
b * 2
```

```
## [1] 6 8 10
```

```
d = c(6,7,8)  
b + d
```

```
## [1] 9 11 13
```


Functions

```
(3+4+5)/3
```

```
## [1] 4
```

or

```
mean(x=b)
```

```
## [1] 4
```

Help!

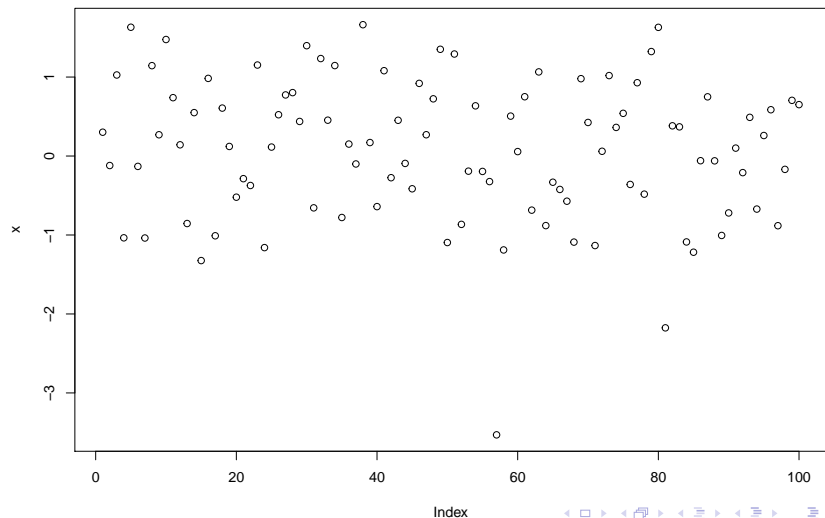
If you are stoned by what is doing this word in your code, try to write:

- ▶ `help(mean)`
- ▶ `?mean`

and look at the bottom right window.

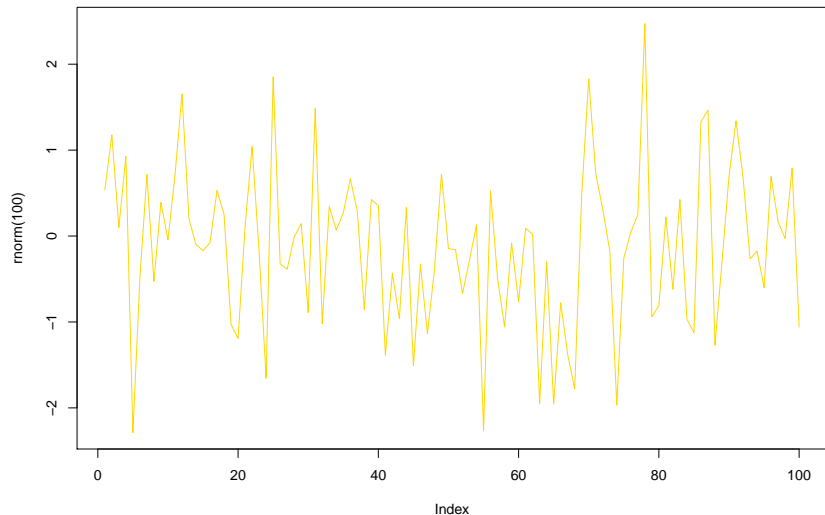
Plot

```
x = rnorm(100)  
plot(x)
```



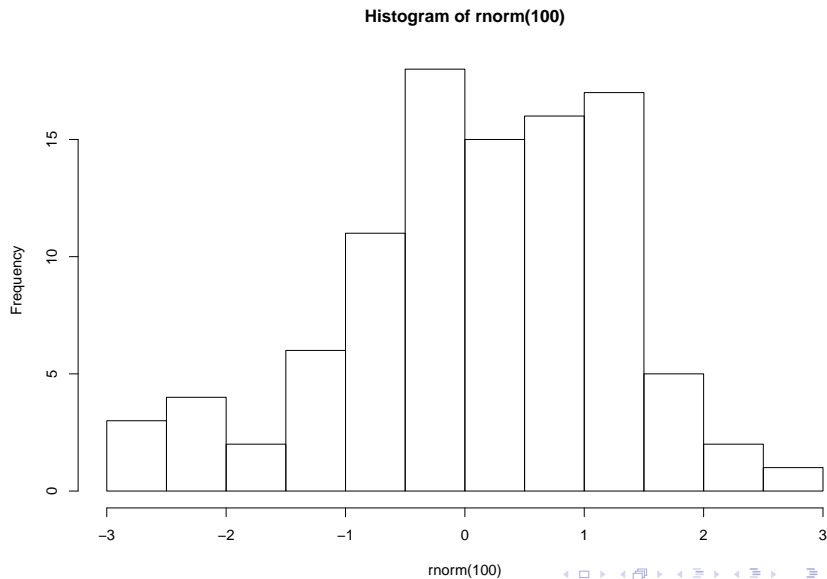
Graphics

```
plot(rnorm(100), type="l", col="gold")
```



Graphics

```
hist(rnorm(100))
```



Matricies

```
mat=matrix(data=c(9,2,3,4,5,6),ncol=3)
```

Loading data

You can move to the directory with your data

```
getwd()  
setwd('./path/to/your/data/')  
iris = read.csv(file = 'iris.data', header = 0) # that gives
```