

## Get Rstudio up and running

On this course we will do statistics with the language of statistical computing called “R”. This is most likely familiar to you from course “Tieteellisen tiedon arviointi ja tulkinta”. We use R through a user-friendly interface called “Rstudio”.

First task is to install R and Rstudio on your computer, in case you haven’t done that already.

For that, go to:

<https://rstudio.com/products/rstudio/download/>

The page prompts you to

1. Install R ( <https://cran.rstudio.com/> ) (you need to choose btw Windows, Mac or Linux).
2. Install Rstudio Desktop. It should recommend you the correct version, but if not, choose from the list either Windows, Mac or a Linux version.

Your system should now have Rstudio installed. Open it

Mac: open Finder, Go → Application → Rstudio.

Windows:

Linux: Open your software menu and search Rstudio.

What you should see is on the next slide ...



# Rstudio

Rstudio shows 3 panels:

Left: **Console**

Console is running R.

The prompt ">"

Is waiting your command.

Try "2+5" (hit Enter) and it returns 7.

Top-right: **Environment**

Shows current

variables (we've none).

Bottom-right:

Shows current **directory**

In future, will show

**Plots and Help pages**

With more complex

computations, we won't

type directly to the

console but choose

File -> New file -> R script

Do it, to open a new

**R script.**

The screenshot displays the RStudio application window. The top menu bar includes File, Edit, Code, View, Plots, Session, Build, Debug, Profile, Tools, Window, and Help. The main workspace is divided into three panels:

- Console (Left):** Shows the R version (3.6.2), copyright information, and a list of help topics. The prompt ">" is visible at the bottom.
- Environment (Top-right):** Shows the current environment is empty.
- Files (Bottom-right):** Shows the current directory (Home) with a list of files and folders, including .R, .Rhistory, Applications, Desktop, Documents, Downloads, Dropbox, and FIN\_UK\_N\_for\_same\_power.png.

The screenshot shows the RStudio interface with the following components:

- Source Editor:** Contains a script with four lines of R code:

```
1 2 + 5
2 x = 4
3 y = 8
4 x * y
```

The first line is highlighted in blue, and a blue arrow points from the 'Run' button to it.
- Environment Panel:** Shows the 'Global Environment' with a table of values:

Variable	Value
x	4
y	8

A blue arrow points from the 'Run' button to this panel.
- Console:** Shows the output of the script:

```
> 2 + 5
[1] 7
> x = 4
> y = 8
> x * y
[1] 32
>
```

A blue arrow points from the 'Run' button to the console output.
- Files Panel:** Shows a file explorer view of the user's home directory, listing folders like .R, .Rhistory, Applications, Desktop, Documents, Downloads, Dropbox, and files like FIN\_UK\_N\_for\_same\_power.png.

**R script** opens on top-left. You can write R commands on script. Repeat the ones shown here.

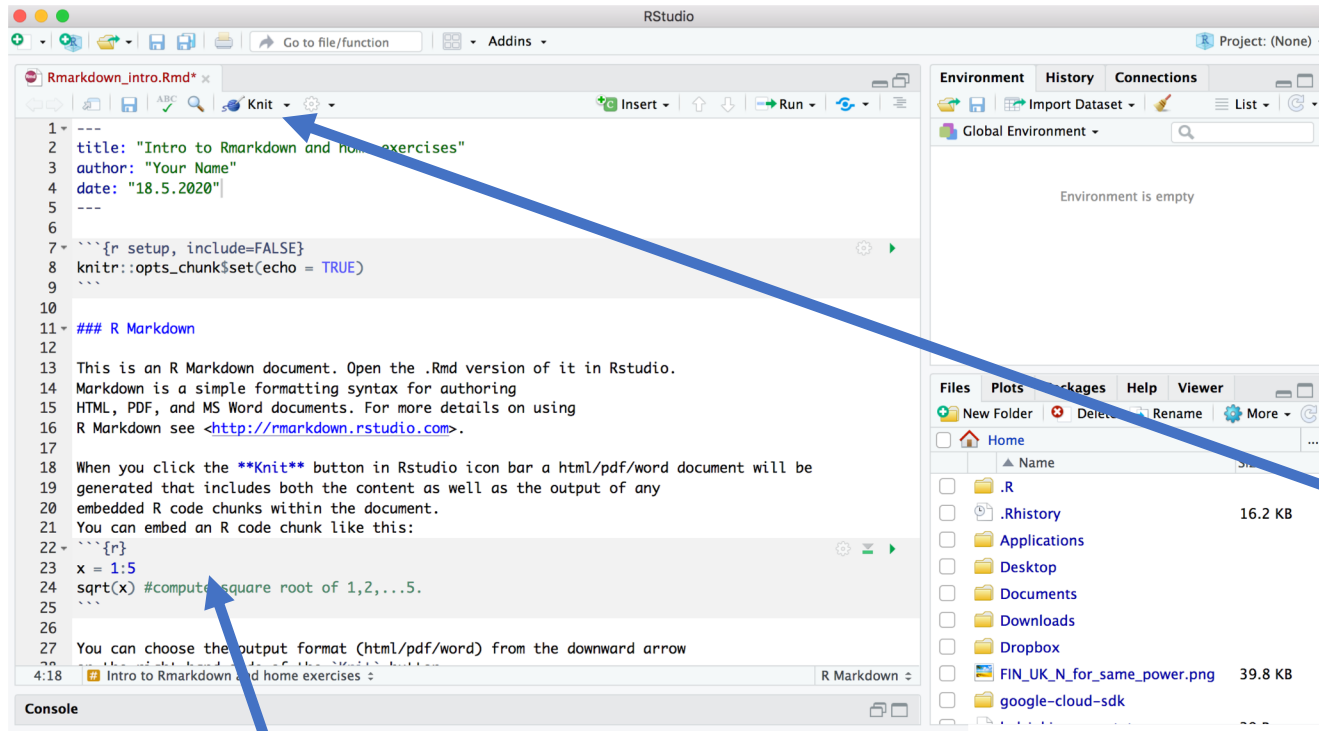
To run any lines, highlight them and click "Run" (cmd + Enter in Mac, cntrl + Enter in Win). It sends them to console below.

With script, you can go back to edit script and re-run. This is easier than typing directly to console.

Note how Environment now shows the values of variables 'x' and 'y'.

Now you know what R script is. You can close this R script without saving. Make a folder for the files of this course on your computer and save *Topic1\_learnR.R* there. It is an R script. Open *Topic1\_learnR.R* in Rstudio and follow it.

After `Topic1_LearnR.R`, open file `Rmarkdown_intro.Rmd` in Rstudio



Upper left corner in Rstudio shows now **Rmd source code**

”Rmd” = Rmarkdown is a document format that can easily combine R commands and R results with standard text, and make PDF, DOC or HTML output.

You can use it for reporting analyses in your project work.

To compile Rmd source code into nice document, click ”Knit”. You can choose format (PDF/HTML/Word) from small downward arrow next to ”Knit”.

Compiling above Rmd file to html format (readable by web browsers) is shown on right.

For example, see how  
Line `### R Markdown` turned into title text  
R code chunk `{r} ...`  is printed out  
And how its result is shown after the code

Follow the Rmd file to complete the toy exercises.

## Intro to Rmarkdown and home exercises

Your Name  
18.5.2020

### R Markdown

This is an R Markdown document. Open the .Rmd version of it in Rstudio. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see <http://rmarkdown.rstudio.com>.

When you click the **Knit** button in Rstudio icon bar a html/pdf/word document will be generated that includes both the content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
x = 1:5  
sqrt(x) #compute square root of 1,2,...5.
```

```
## [1] 1.000000 1.414214 1.732051 2.000000 2.236068
```