Get Rstudio up and running

On this course we will do statistics with the language of statistical computing called "R". 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 University of Helsinki computers, install "R" and "Rstudio" from University's software center. With other computers, go to:

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

The page prompts you to

- 1. Install R (<u>https://cran.rstudio.com/</u>) (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 \rightarrow Application \rightarrow Rstudio. Windows:

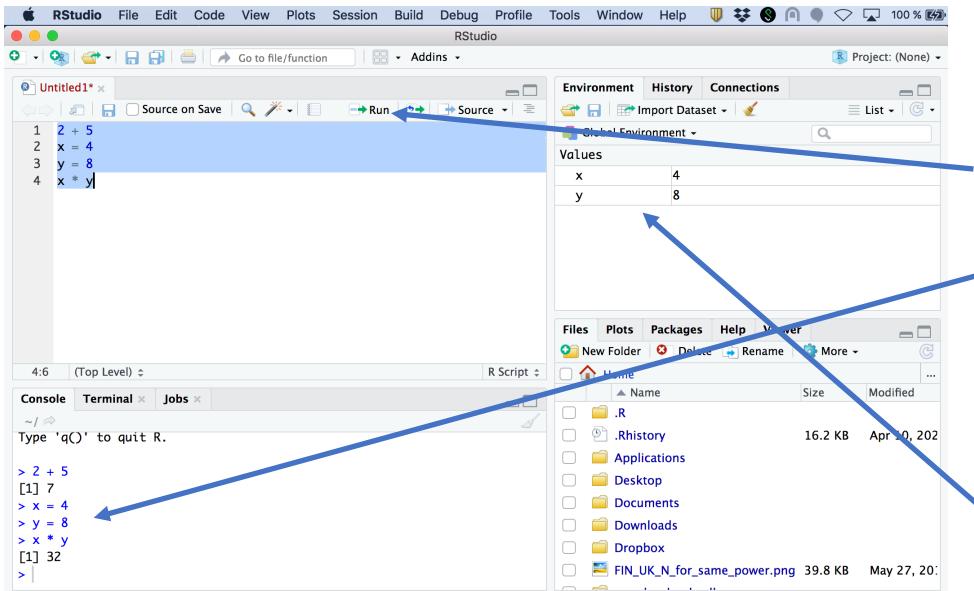
Linux: Open your software menu and search Rstudio.

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



Rstudio

🗯 RStudio File Edit Code View Plots Session Build Debug I	Profile	Tools Window	Help	0 🔅 🔍	$\blacksquare \blacklozenge \heartsuit$	82 % 🛃	, Left: Console
RStudio							Console is running R.
							The prompt ">"
Console Terminal × Jobs ×	ð	Environment	History	Connections			Is waiting your command
~/ 🖈	S	🚰 🔒 🖙 I	mport Data	aset 🗸 🔏		List 🗸 📿 🗸	Try "2+5" (hit Enter) and
		Global Environment -				it returns 7.	
R version 3.6.2 (2019-12-12) "Dark and Stormy Night" Copyright (C) 2019 The R Foundation for Statistical Computing							it returns 7.
Platform: x86_64-apple-darwin15.6.0 (64-bit)		Environment is empty					Top-right: Environment
R is free software and comes with ABSOLUTELY NO WARRANTY.							
You are welcome to redistribute it under certain conditions.						Shows current	
Type 'license()' or 'licence()' for distribution details.							variables (we've none).
Natural language support but running in an English locale							
R is a collaborative project with many contributors.							Bottom-right:
Type 'contributors()' for more information and		Files Plots Packages Help Viewer					Shows current directory
<pre>'citation()' on how to cite R or R packages in publications.</pre>			🕴 Dele	ete 📑 Rename	🔯 More 🚽	G	
Type 'demo()' for some demos, 'help()' for on-line help, or		□ 1 Home					In future, will show
'help.start()' for an HTML browser interface to help.		A Na	me		Size	Modified	Plots and Help pages
Type 'q()' to quit R.		🗌 🧰 .R					
>						Apr 10, 202	² With more complex
		Applications					
		 Desktop Documents Downloads Dropbox 					computations, we won't
						type directly to the	
							console but choose File -> New file -> R script
			JK_N_for_	same_power.pn 	39.8 KB N	May 27, 20:	Do it, to open a new
							R script.



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

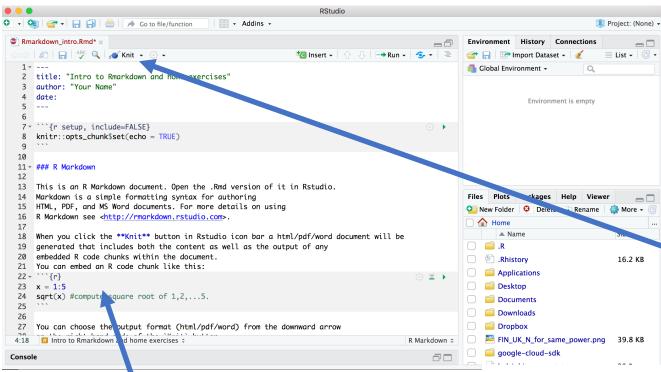
To run any lines, highlight them and click "Run" (cmd + Enter in Mac cntrl + Enter in Win) It sends them to console below.

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.

Intro to Rmarkdown and home exercises

Your Name

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

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.

Follow the Rmd file to complete the toy exercises.

[1] 1.000000 1.414214 1.732051 2.000000 2.236068