

Practical Exercise 1 + R and R Studio Setup

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Installing R and R Studio

About the R and RStudio

To learn more about R and RStudio, use [R For Data Science \(Second Edition\)](#), specifically [R4DS Chapter “Intro”, section 1.4 Prerequisites](#)



- R is an open-source statistical programming language
- R is also an environment for statistical computing and graphics
- It's easily extensible with packages, see: <https://cran.r-project.org/>

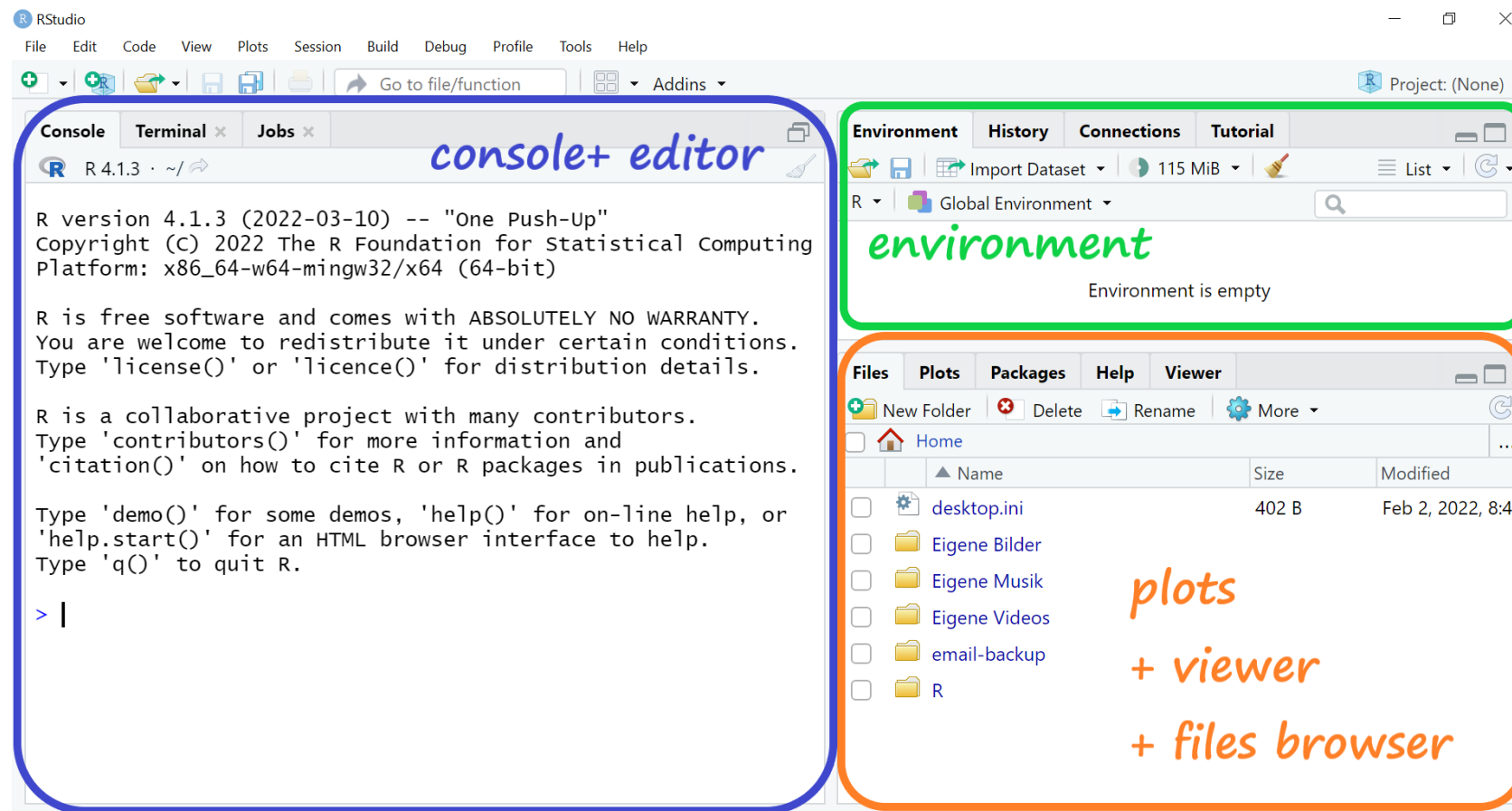


- RStudio is an IDE (integrated development environment) for R
- RStudio is not a requirement for programming with R, but it's commonly used by R programmers and data scientists <https://www.rstudio.com/>

R + RStudio Installation

1. **Download R** from here: cran.r-project.org
2. **Install R** by double click on the installation file and clicking next...
3. **Download free version of R Studio** from here: rstudio.com
4. **Install RStudio** by double click on the installation file and clicking next...
5. **Check that RStudio** has been installed by typing “RStudio” in the start menu or Windows search.
6. (Optional) **Check that R** has been installed by typing “R x” in the start menu or Windows search.

R and R Studio: introduction and interface



- Console (left bottom) - to type the R code into
- Editor (left top) - to **write** and **SAVE** scripts, analysis and documentation.
- Environment (right top) - overview of the r session and objects in there
- Plots, Files and Viewer (right bottom) - files navigation, plots export and inspection.

Scripts editor

The screenshot displays the RStudio interface with the following components:

- Scripts editor (Untitled1* x):** Contains the following R code:


```
1 2 + 2
2
3 print("Hello world")
4
```
- Environment pane:** Shows the Global Environment, which is currently empty.

Environment is empty
- Console:** Shows the output of the R code executed in the Scripts editor:


```
R 4.1.3 ~ /
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.

> 2 + 2
[1] 4
> print("Hello world")
[1] "Hello world"
>
```
- Files pane:** Shows the file explorer with the following files:

Name	Size	Modified
.Renvi	41 B	Oct 25, 2021, 11:16 AM
.Renvi_backup	247 B	Jul 29, 2021, 3:14 PM
.Rhistory	17.7 KB	Apr 11, 2022, 3:02 PM
ae01-soft-intro-to-R.Rproj	204 B	Apr 11, 2022, 9:51 AM
Bowls.pdf	2.7 MB	Jan 8, 2021, 10:47 AM
Bowls2.pdf	2.7 MB	Jan 8, 2021, 10:48 AM

R Markdown editor

The screenshot shows the RStudio R Markdown editor interface. The main editor window (labeled "editor" in orange) contains the following R Markdown code:

```

1 ---
2 title: "Test document"
3 output: html_document
4 ---
5
6 {r setup, include=FALSE}
7 knitr::opts_chunk$set(echo = TRUE)
8
9
10 ## R Markdown
11
12 This is an R Markdown document. 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>.

```

The "Knit" button in the toolbar is circled in red, with a red arrow pointing to it and the text "Knit, means render a document" written in red. The "R Markdown Including Plots" pane (labeled "outline" in blue) shows the document structure. The "Results viewer" (labeled "Results viewer" in green) displays the rendered HTML output, including the title "Test document", the subtitle "R Markdown", and the text content. Below the text, the output of the R code chunk `summary(cars)` is shown as a table:

	speed	dist
## Min.	: 4.0	Min. : 2.00
## 1st Qu.:	12.0	1st Qu.: 26.00
## Median :	15.0	Median : 36.00
## Mean :	15.4	Mean : 42.98
## 3rd Qu.:	19.0	3rd Qu.: 56.00
## Max.	:25.0	Max. :120.00

The console window at the bottom shows the R startup message and the prompt `>`.

Practical Exercise 01. Checks and balances in the RCT

Application Exercise 01

In the classroom:

Turn on your PC

Use these log in and password.

⚠ Important

Login: [ZH-user-pc1](#)

Password: [V5-senc!3ken](#)

1. Go to: bit.ly/3GD8Oap
2. Scroll and download [ex01-rct.zip](#).
3. **DON'T OPEN IT!** setup your working folders first (next slide).

Setup working folders

Navigate to your user folder: [C > Users > Name of your user account](#);

- Create there a **course folder** names [{your initial}-mk223-2023](#).
 - Use it for your course for all in-class work;
 - on my pc the course folder is called [eb-mk223-2023](#);
 - the full path is [C:\Users\ZH-user-pc1\eb-mk223-2023](#);
- Paste [ex01-rct.zip](#) from downloads to the **course folder**;
- Unzip [ex01-rct.zip](#) into ex01-rct;

Launch the R Studio from the project “ae01-soft-intro-to-R”

- Navigate to `ex01-rct` in your course folder
- Open `ex01-rct.Rproj` that has R studio icon and `.Rproj` extension:

