

Practical Exercise 1 + R and R Studio Setup

Eduard Bukin

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/>

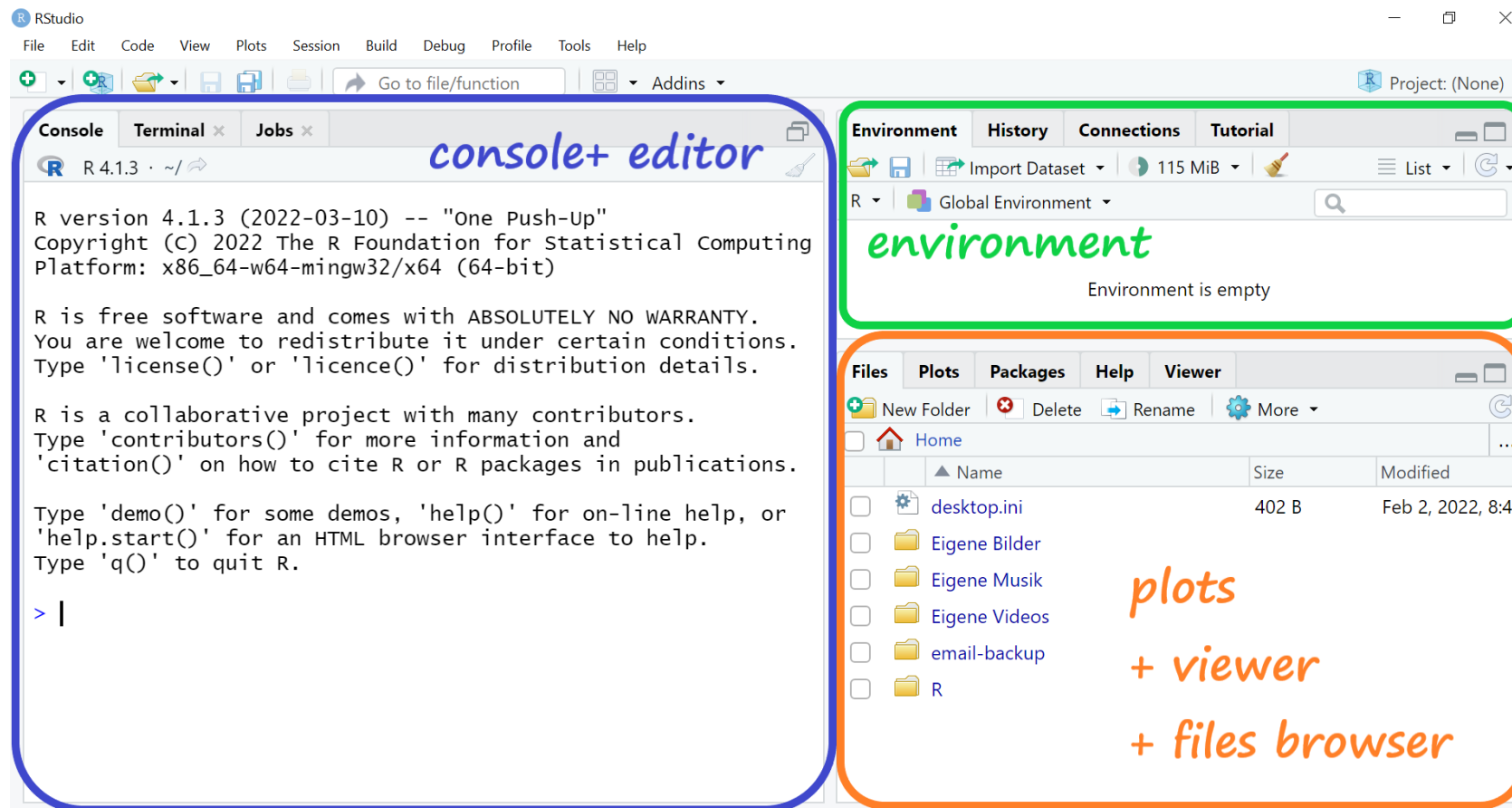


- RStudio is an IDE (integrated development environment) for R
- RStudio is not a requirement for programming with R, but it's commonly used by R programmers and data scientists <https://www.rstudio.com/>

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:** Displays a list of files in the current directory:

Name	Size	Modified
.Renviro	41 B	Oct 25, 2021, 11:16 AM
.Renviro_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 on the left contains the R Markdown source code. The top toolbar includes the **Knit** button, which is circled in red. A red arrow points from the **Knit** button to the **Results viewer** on the right. The **Results viewer** displays the rendered HTML output of the document. The **editor** is highlighted with an orange box, the **outline** with a blue box, and the **Results viewer** with a green box.

Knit, means render a document

editor

```

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>.
  
```

outline

Results viewer

Test document

R Markdown

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>.

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

```
summary(cars)
```

##	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

Console

```

R 4.1.3 ~/
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.

>
  
```


Practical Exercise 01. Checks an balances in teh 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:



ae01-soft-intro-to-R.Rproj

