Introduction to R and RStudio IDE

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August 19, 2019

1. Why use R?
2. R and RStudio
3. R script
4. Function and Object
5. R packages
6. Working directory
7. Help

Section 1

Why use R?

R

R is a free software environment for statistical computing and graphics. It compiles and runs on a wide variety of UNIX platforms, Windows and MacOS.

Source: https://www.r-project.org/

R outpaces other statistics software

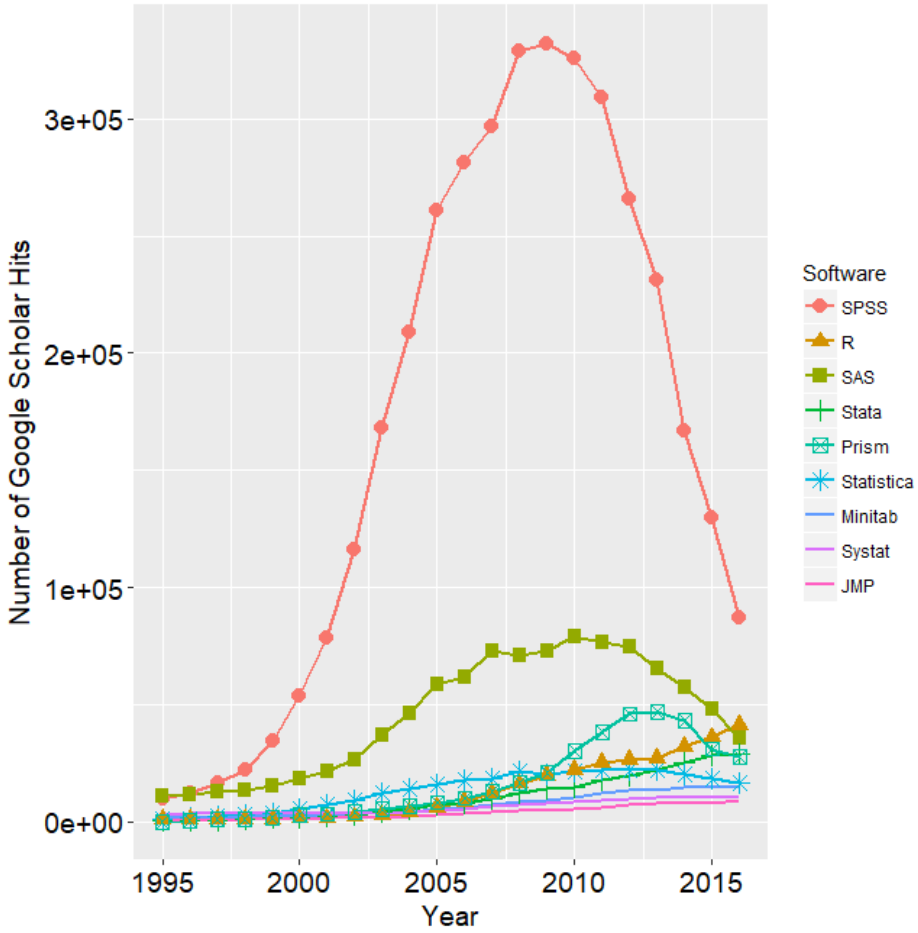


Figure 1: R popularity

Source: http://r4stats.com/articles/popularity/

R is getting more popular among academician

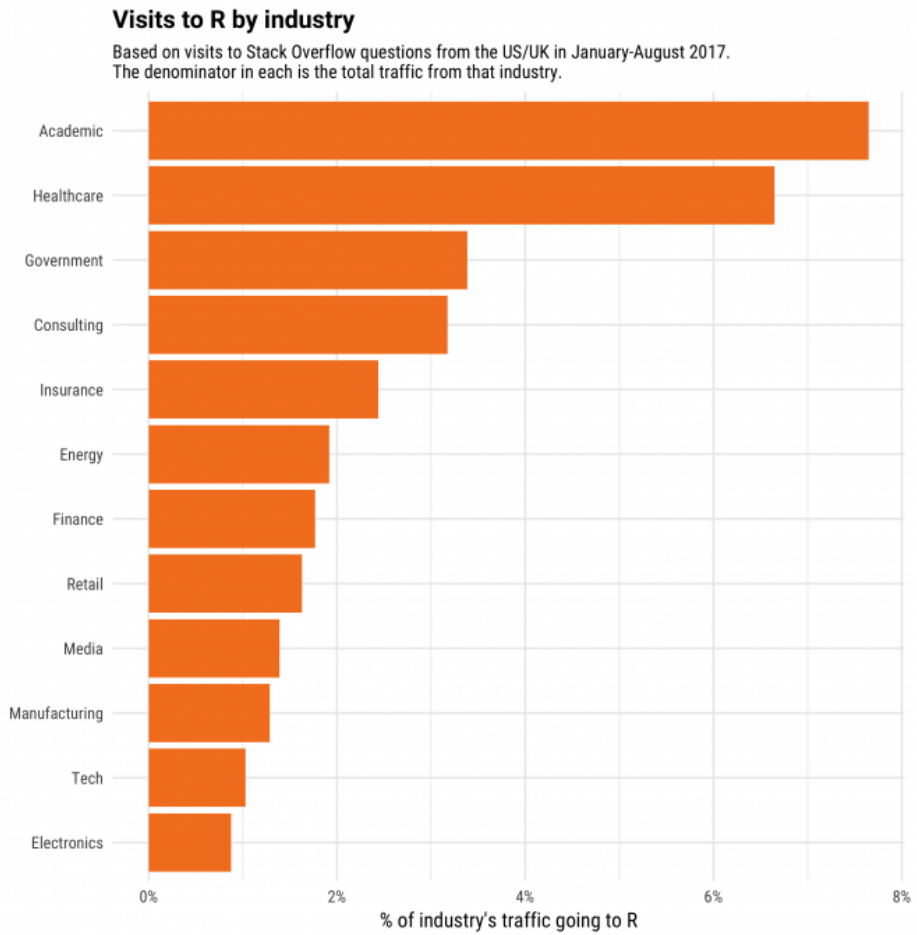


Figure 2: Impressive growth of R

Source: https://stackoverflow.blog/2017/10/10/impressive-growth-r/

Availability of R packages

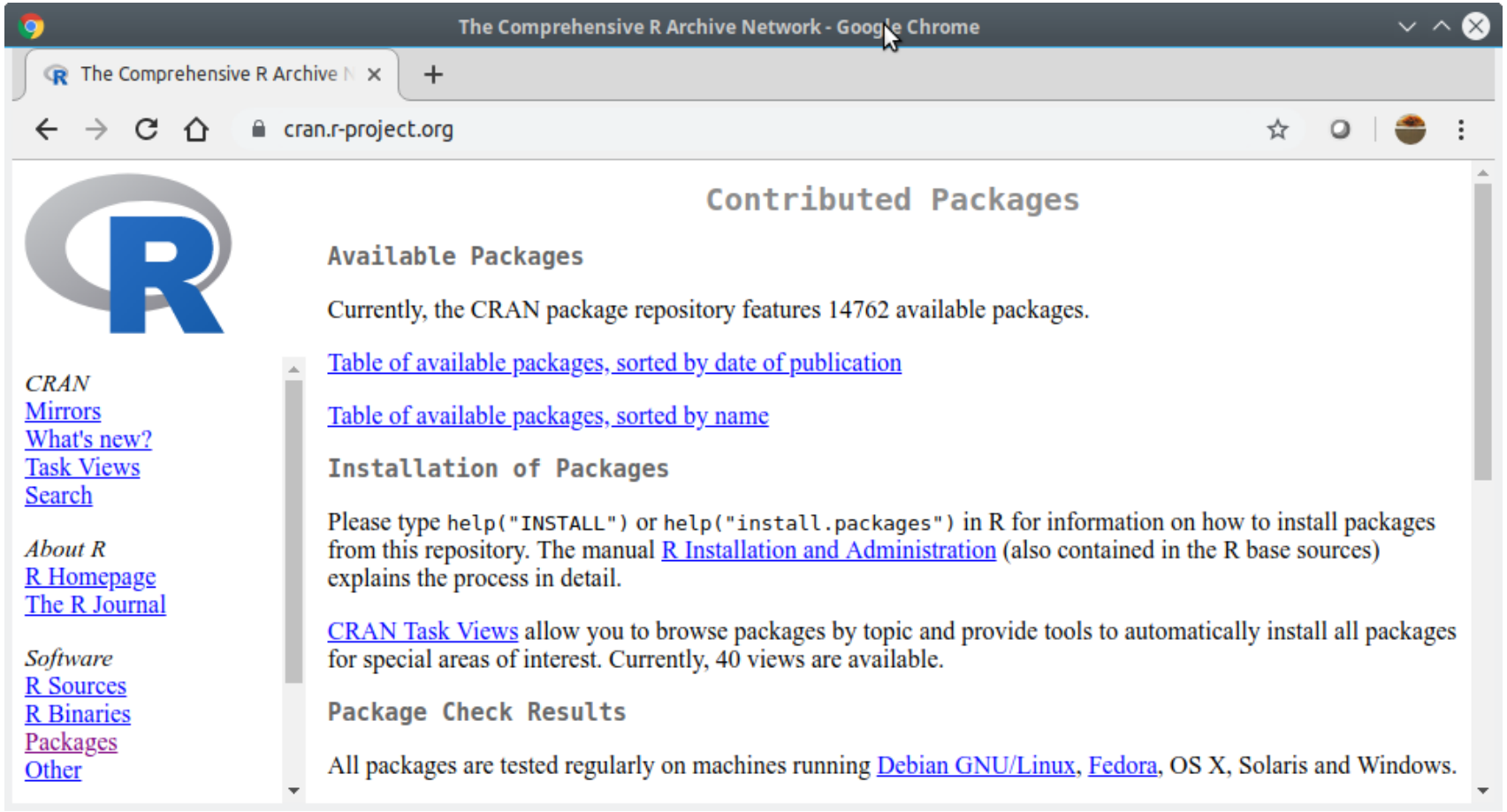


Figure 3: CRAN

Source: https://cloud.r-project.org/web/packages/index.html, as of 18/8/2019.

Another reason to use R...

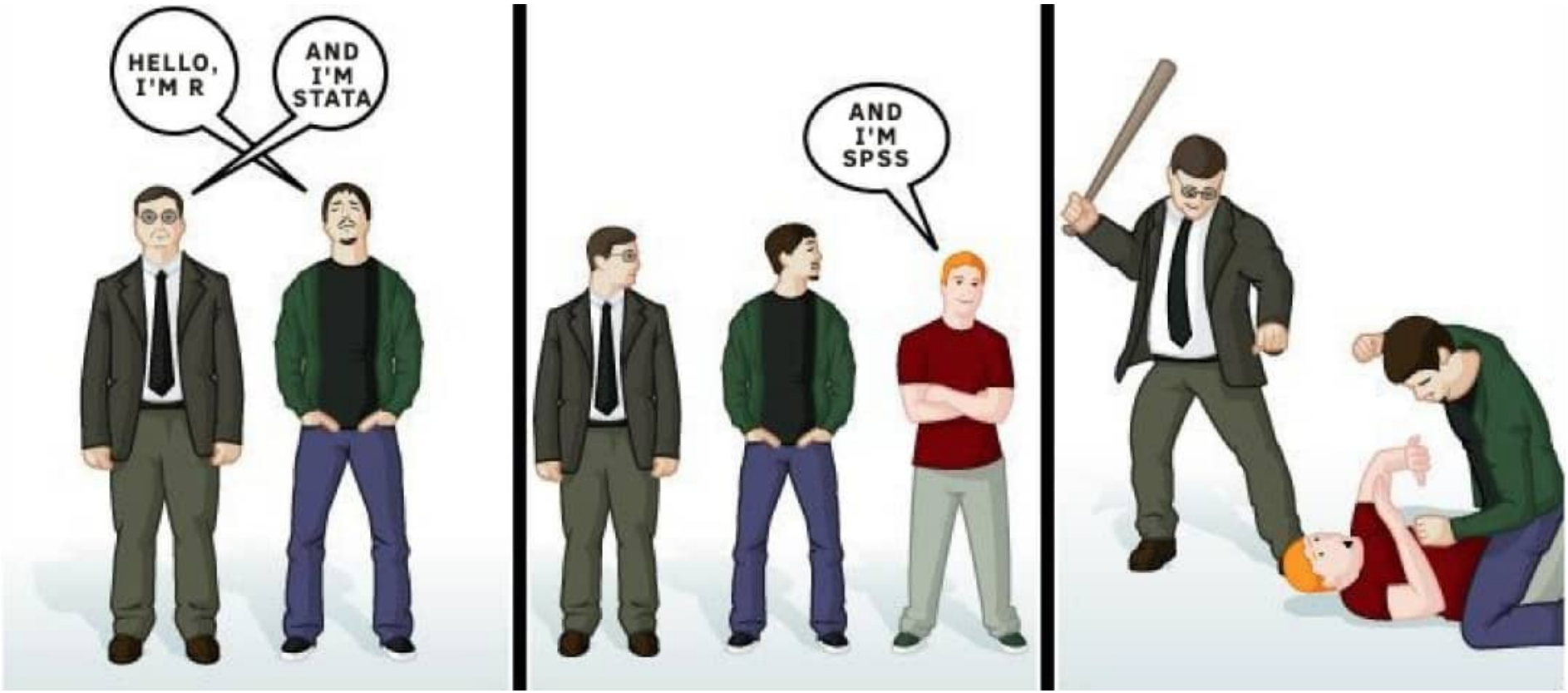


Figure 4: ???

Source: Thanks Dr. KIM ;-) Modified comic from duelinganalogs.com on PC vs Mac vs Linux.

Section 2

R and RStudio

R Installation

R @ https://cran.r-project.org/

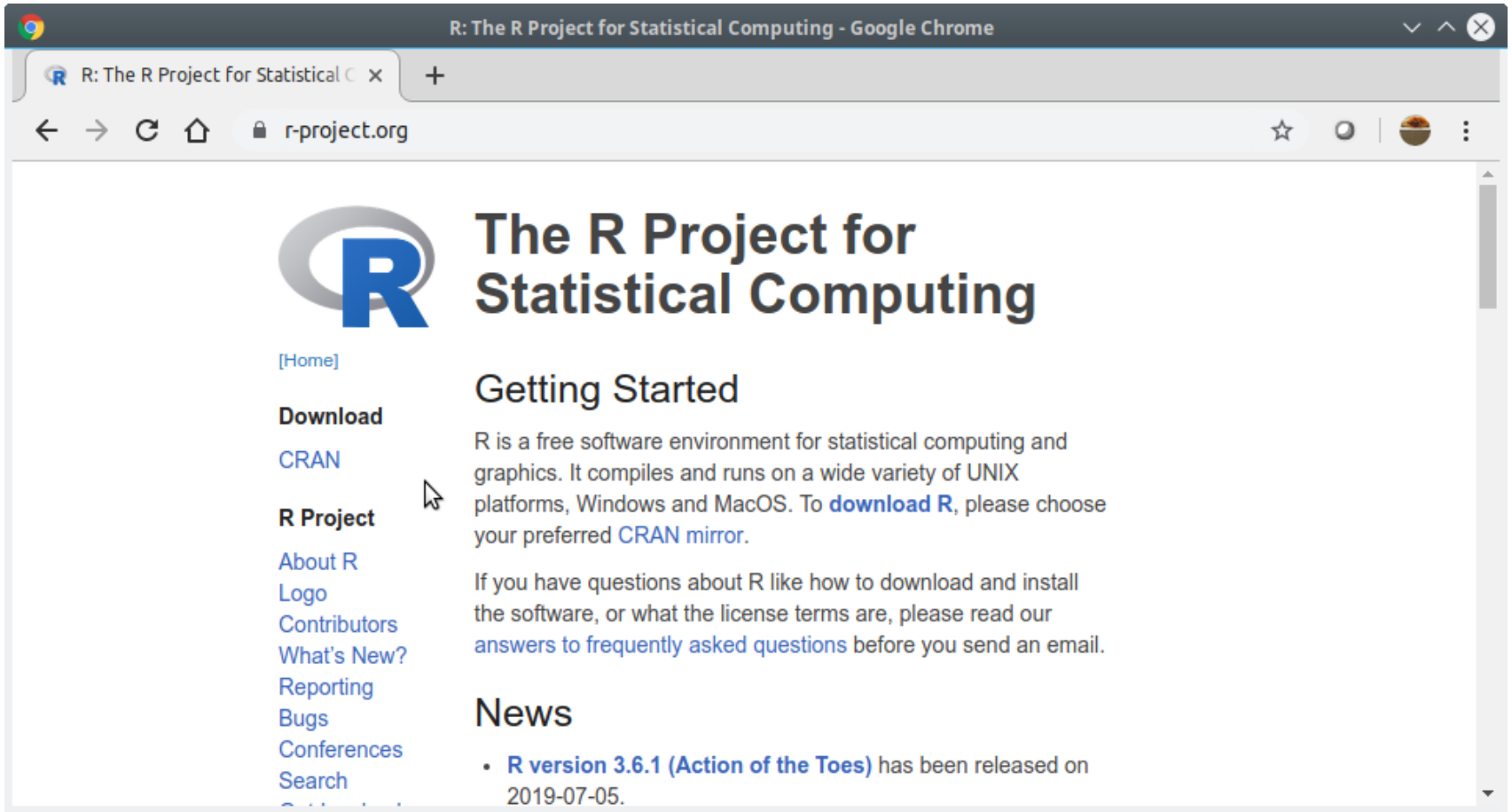


Figure 5: R Project

RStudio Installation

RStudio @ https://www.rstudio.com/products/rstudio/download/

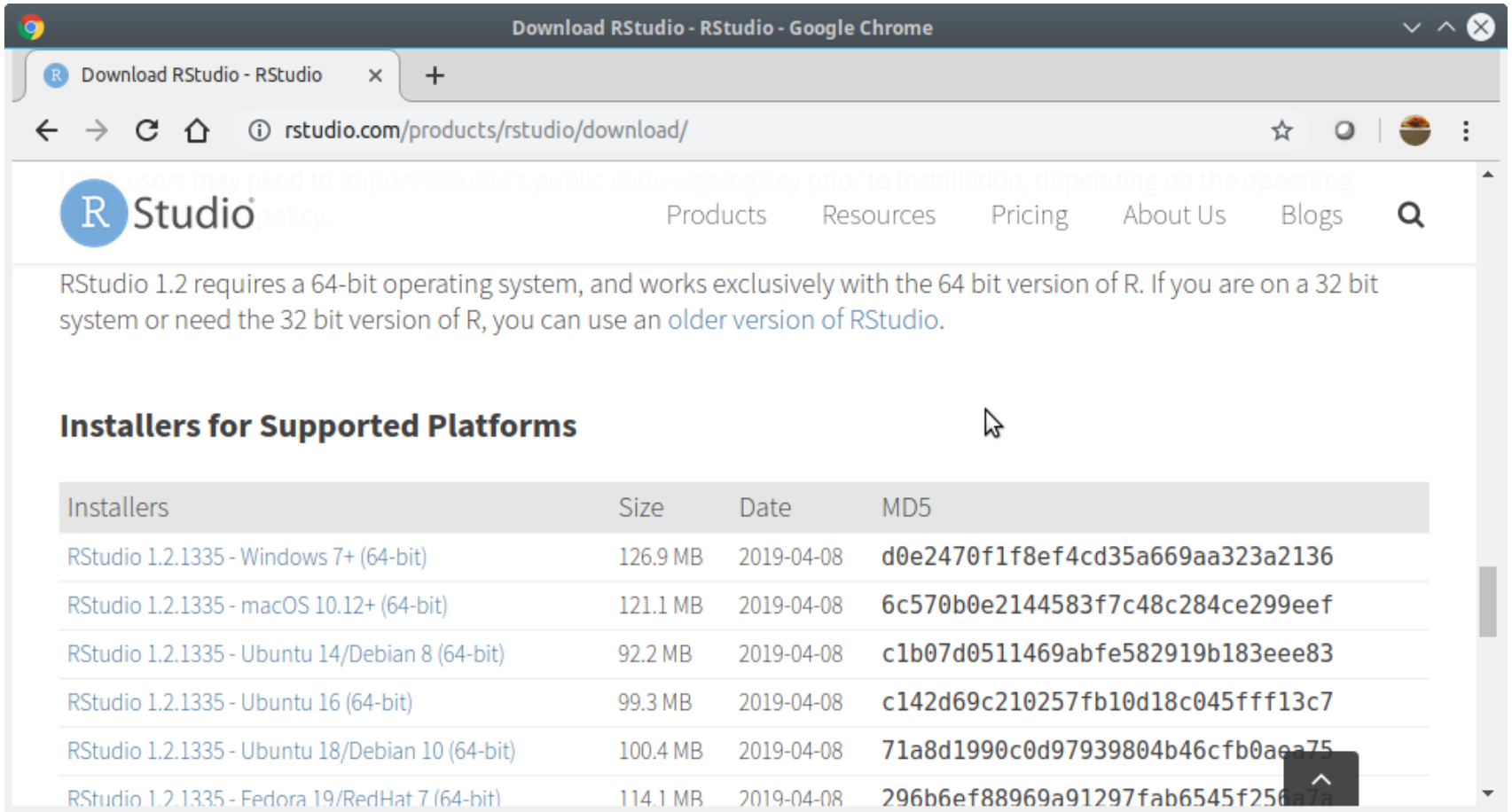


Figure 6: RStudio

Alternative: RStudio Cloud

RStudio Cloud @ https://rstudio.cloud/ (no need to install R)

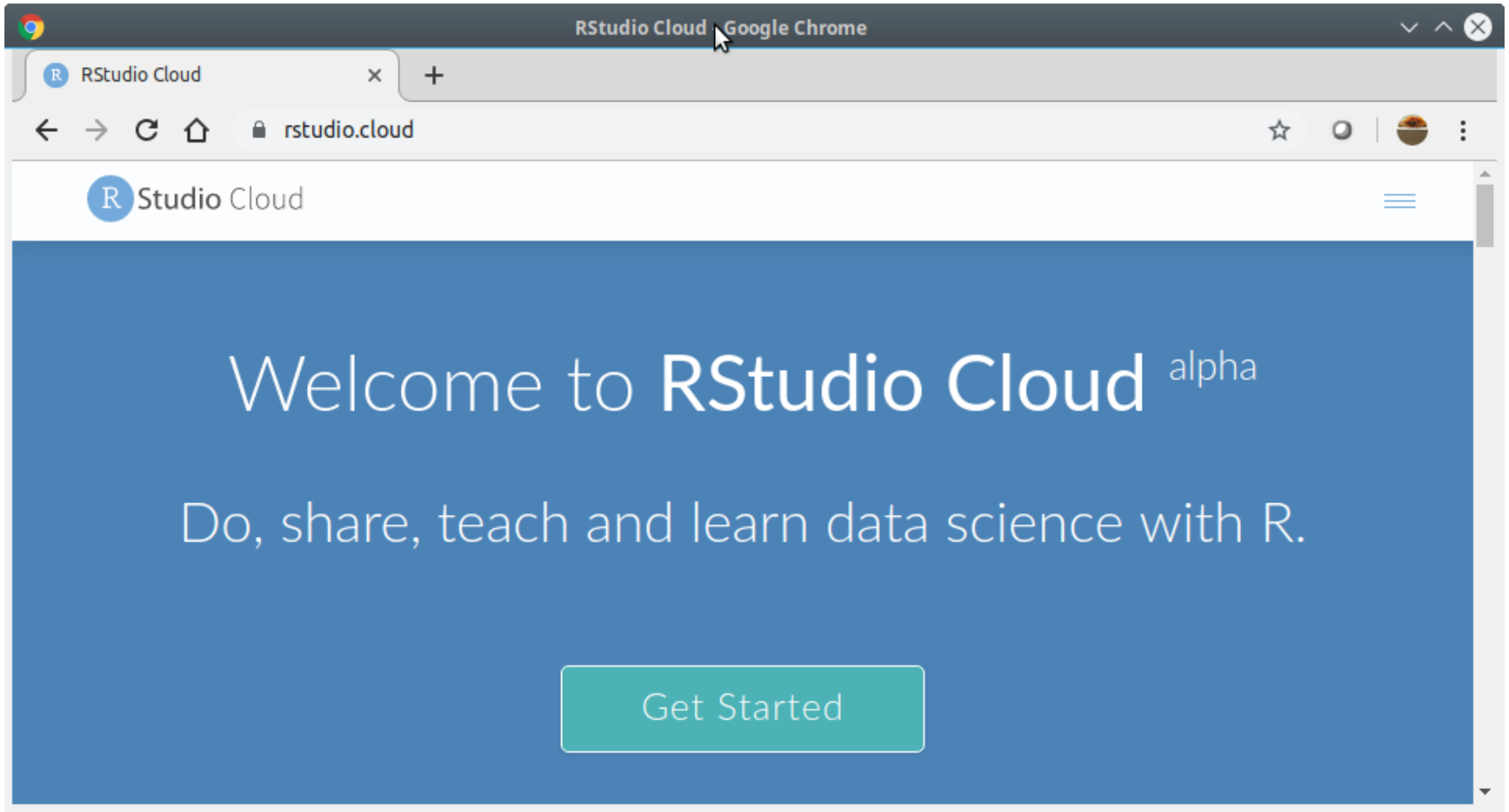
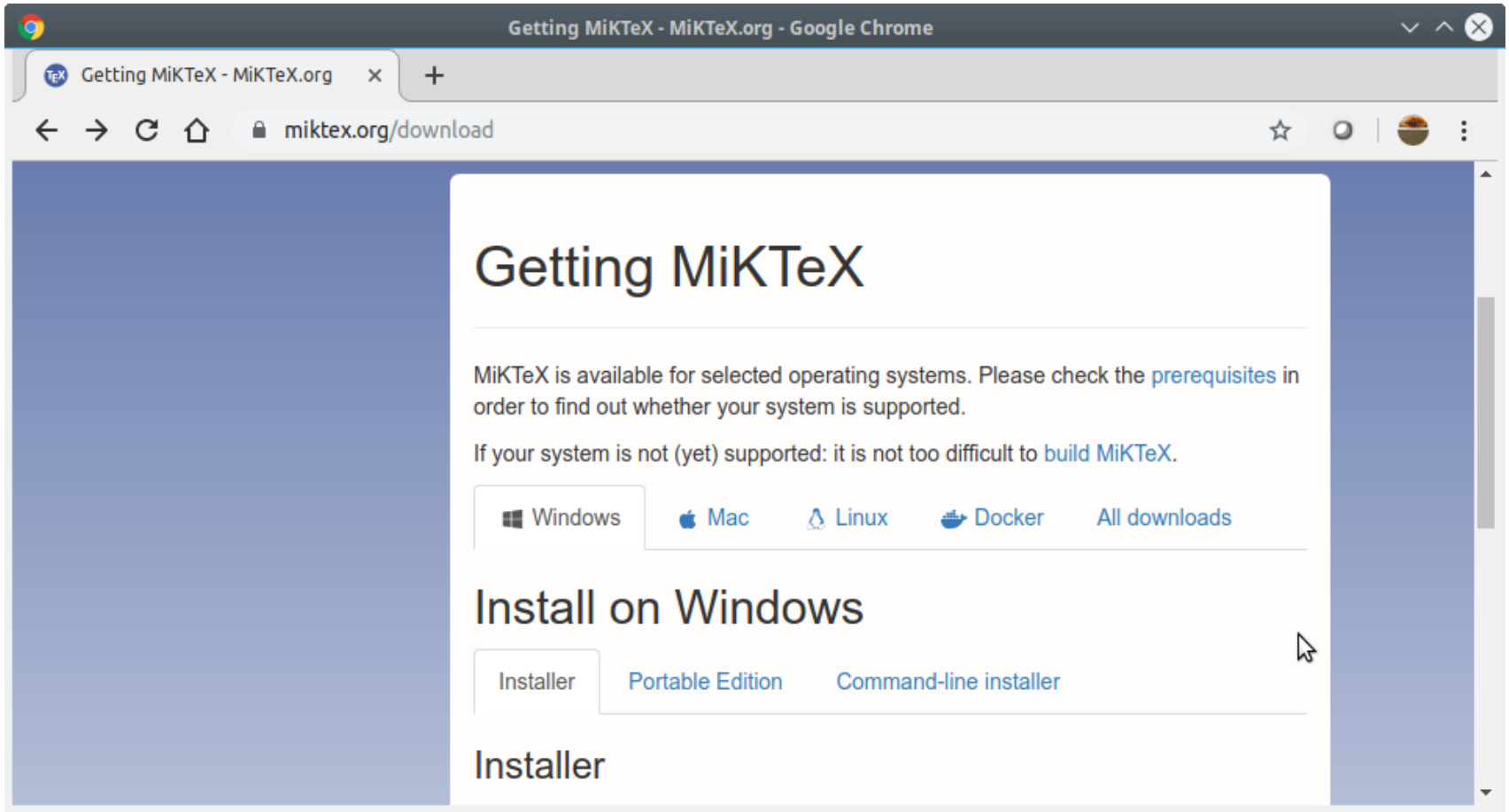


Figure 7: RStudio

R to PDF Installation

- Windows & MacOS – MikTeX @ https://miktex.org/download
- Linux – texlive.

Important for R-markdown session later.



R Interface

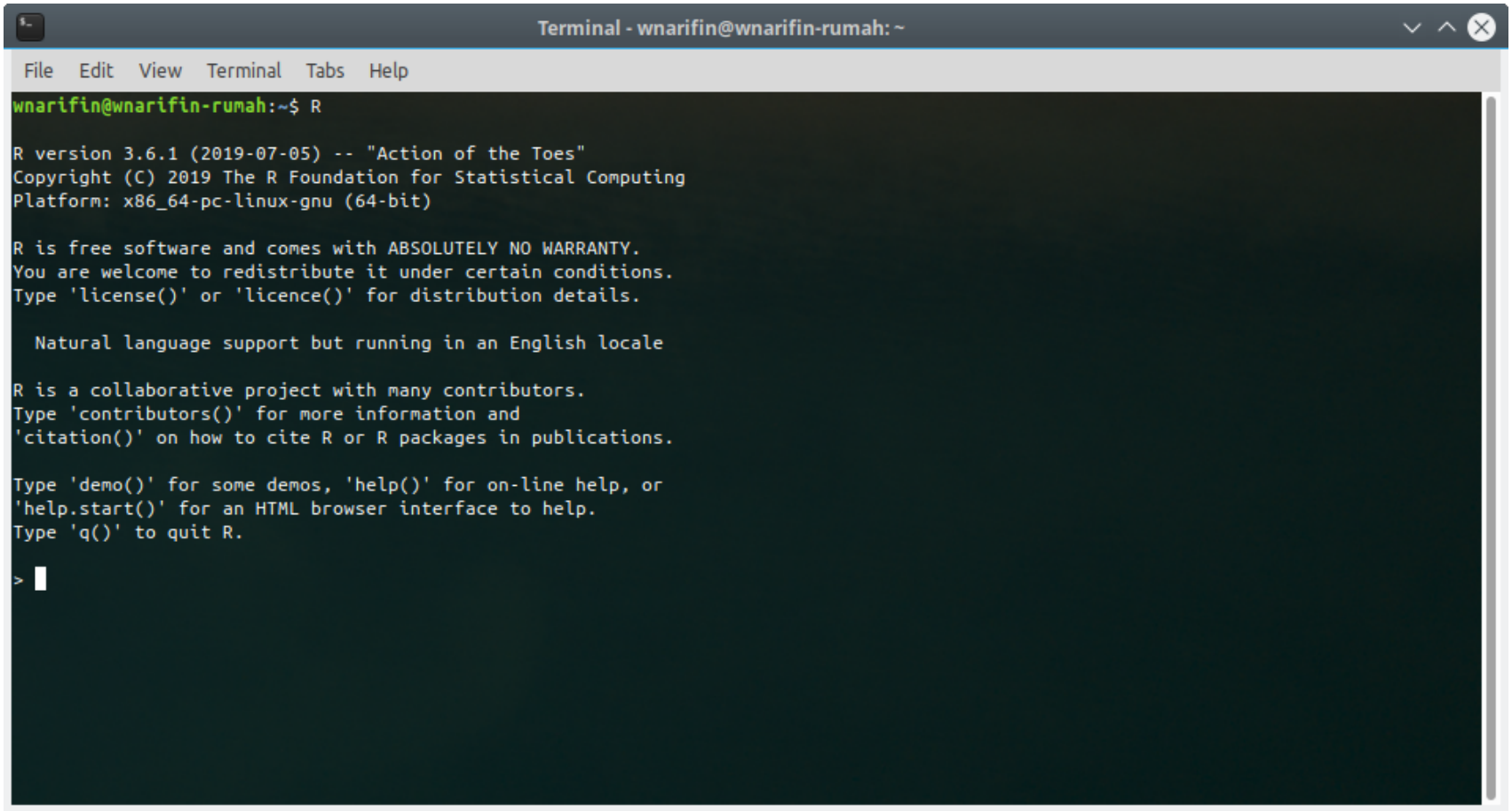


Figure 9: Plain R

RStudio Interface

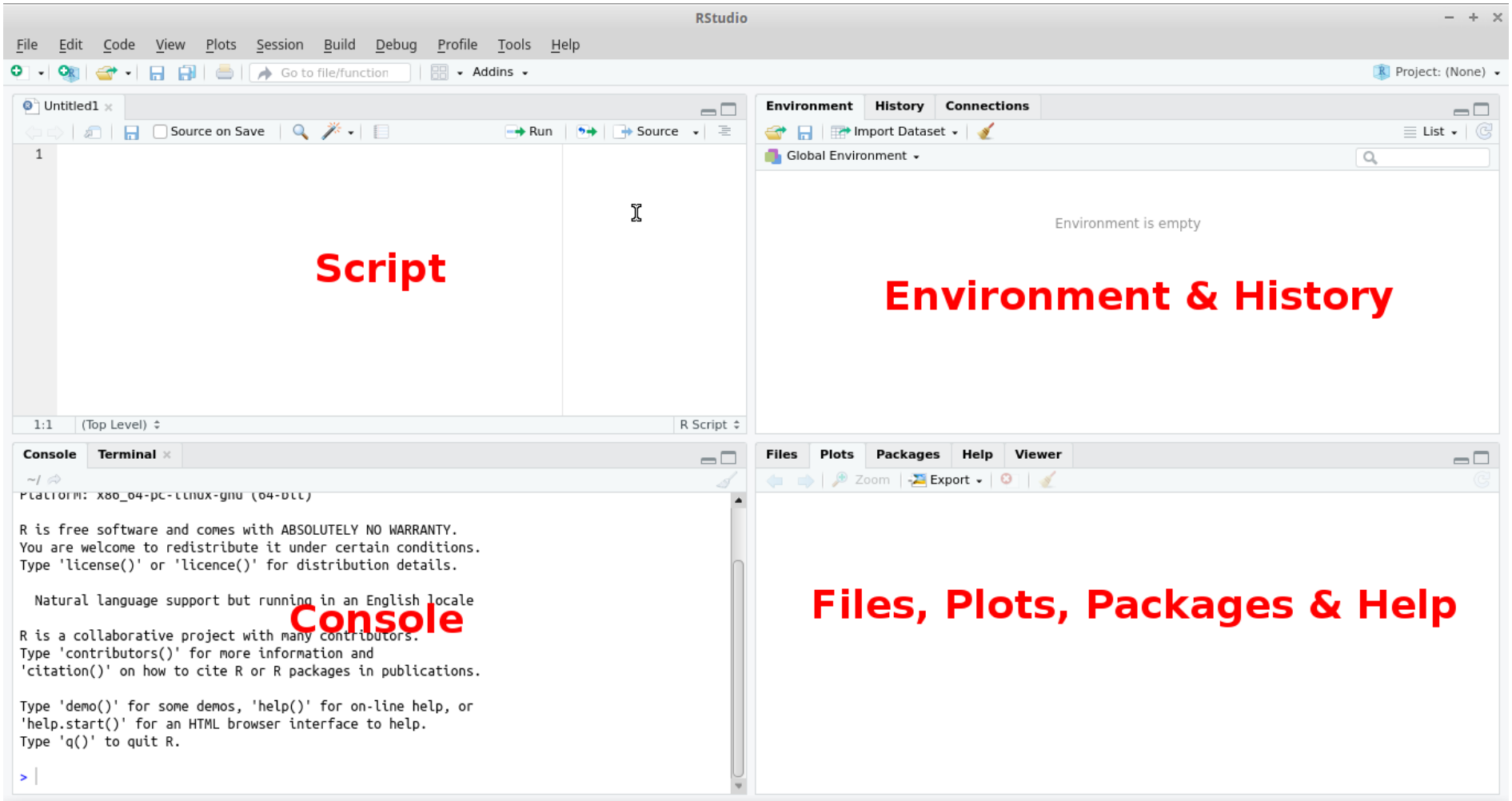


Figure 10: RStudio

RStudio Cloud Interface

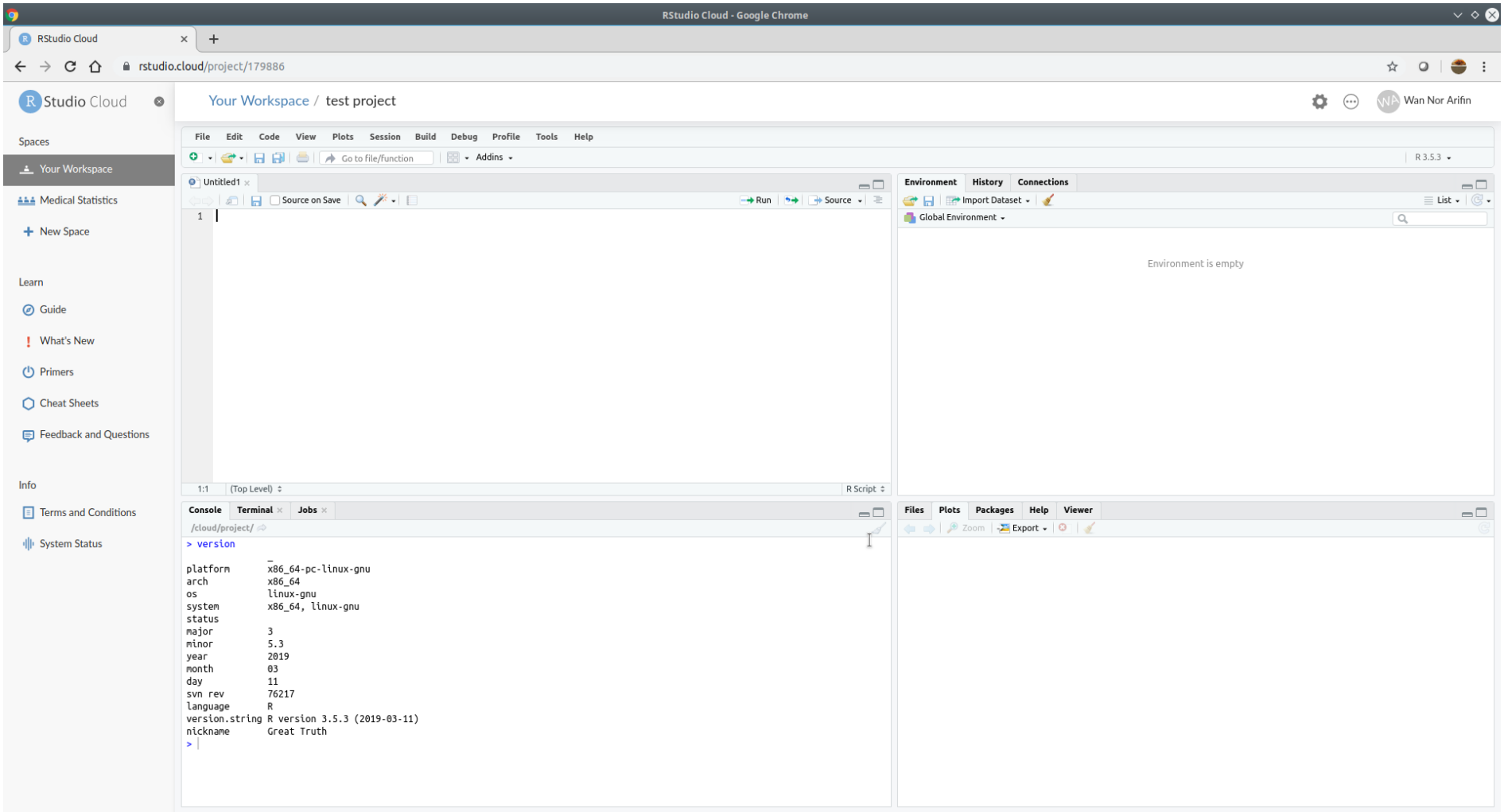


Figure 11: RStudio Cloud

Section 3

R script

Script panel

File > New file > R script

- type all commands/functions here
- comments, start with "#"
- run all commands by Ctrl+Enter

Section 4

Function and Object

Function

- R function(), think of MS Excel function
- structure

$$\text{function(argument1} = \text{value, argument2} = \text{value)}$$

Object

- name assigned on left side of "<-" / "="
- variable, data (data frame, matrix, list)

```
x <- 1
y = 2
z = x + y
z  # type object name, you'll get the value
```

Section 5

R packages

Install packages a.k.a libraries

- Graphically

Packages > Install

- Command

e.g. psych, car

```
install.packages("psych")
install.packages("car")
```

Load libraries

e.g. load `psych` and `car`,

```
library(psych)
library(car)
```

Section 6

Working directory

Why do we need working directory?

- Systematic workflow.
- Save all R scripts, datasets in the same directory.

Set working directory

1. Browse to target directory: **Files Tab** $>$ **...** $>$ **Go To Folder**
2. **Files Tab** $>$ **More** $>$ **Set As Working Directory**
3. **Files Tab** $>$ **More** $>$ **Go To Working Directory** to ensure you are at the right place.

Section 7

Help

Help

If you know the name of packages/functions,

```
?psych
?library
```

Search by keywords,

```
??mean
??survey
```

Thank you

References

Fox, J., Weisberg, S., & Price, B. (2019). *Car: Companion to applied regression*. Retrieved from https://CRAN.R-project.org/package=car

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Revelle, W. (2019). *Psych: Procedures for psychological, psychometric, and personality research*. Retrieved from https://CRAN.R-project.org/package=psych