

Foundations of R Software

Lecture 5

Introduction

⋮

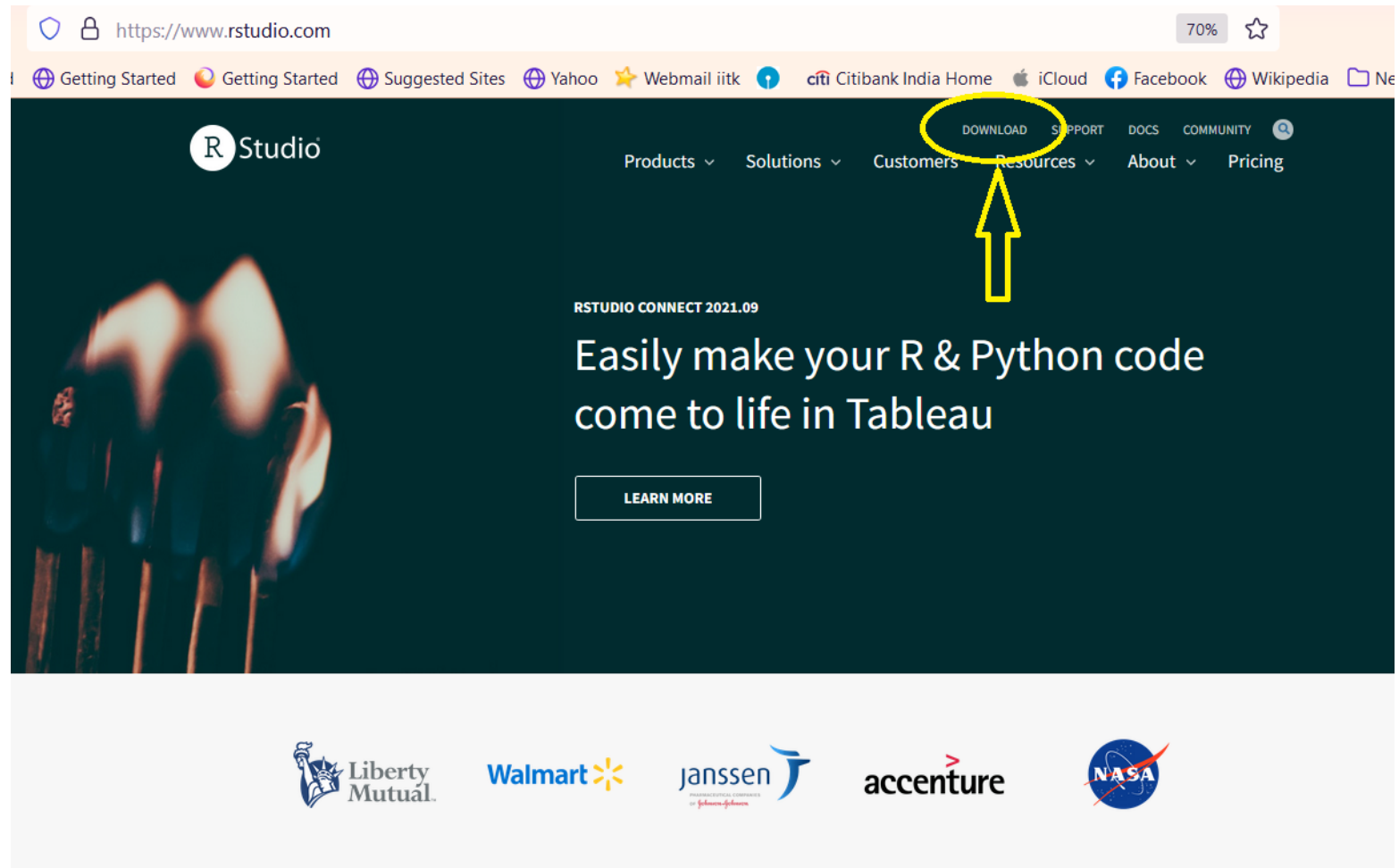
Introduction to R Studio

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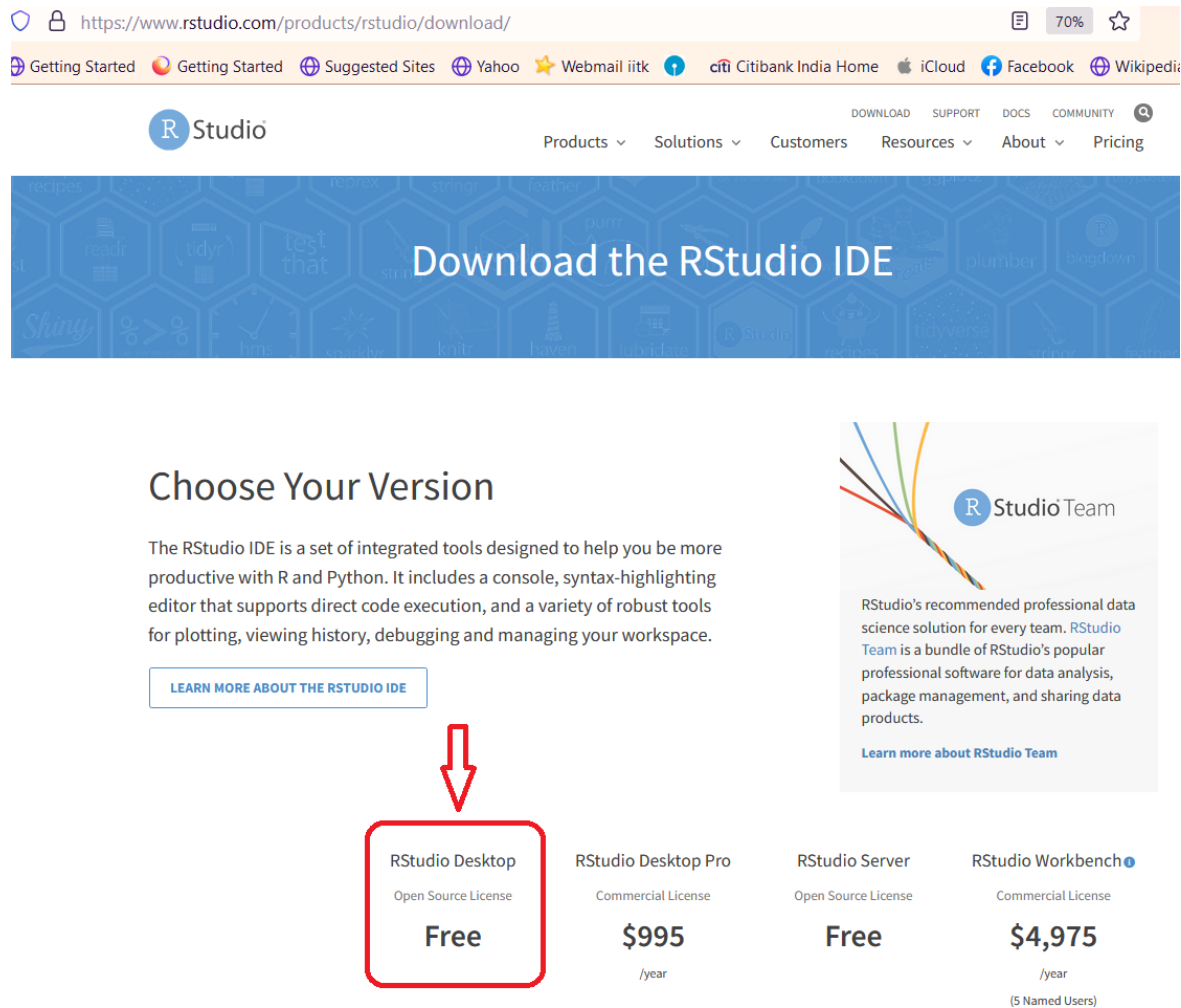
Indian Institute of Technology Kanpur

Installing R Studio



Click on Download.

Installing R Studio



The screenshot shows the RStudio website's download page. At the top, the browser address bar shows 'https://www.rstudio.com/products/rstudio/download/'. Below the navigation bar, a large blue banner reads 'Download the RStudio IDE'. Underneath, the 'Choose Your Version' section describes the RStudio IDE as a set of integrated tools for R and Python. A red arrow points from a 'LEARN MORE ABOUT THE RSTUDIO IDE' button to the 'RStudio Desktop' option. The pricing table below lists four options: RStudio Desktop (Open Source License, Free), RStudio Desktop Pro (Commercial License, \$995/year), RStudio Server (Open Source License, Free), and RStudio Workbench (Commercial License, \$4,975/year for 5 Named Users).

Choose Your Version

The RStudio IDE is a set of integrated tools designed to help you be more productive with R and Python. It includes a console, syntax-highlighting editor that supports direct code execution, and a variety of robust tools for plotting, viewing history, debugging and managing your workspace.

[LEARN MORE ABOUT THE RSTUDIO IDE](#)

RStudio Desktop
Open Source License
Free

RStudio Desktop Pro
Commercial License
\$995
/year

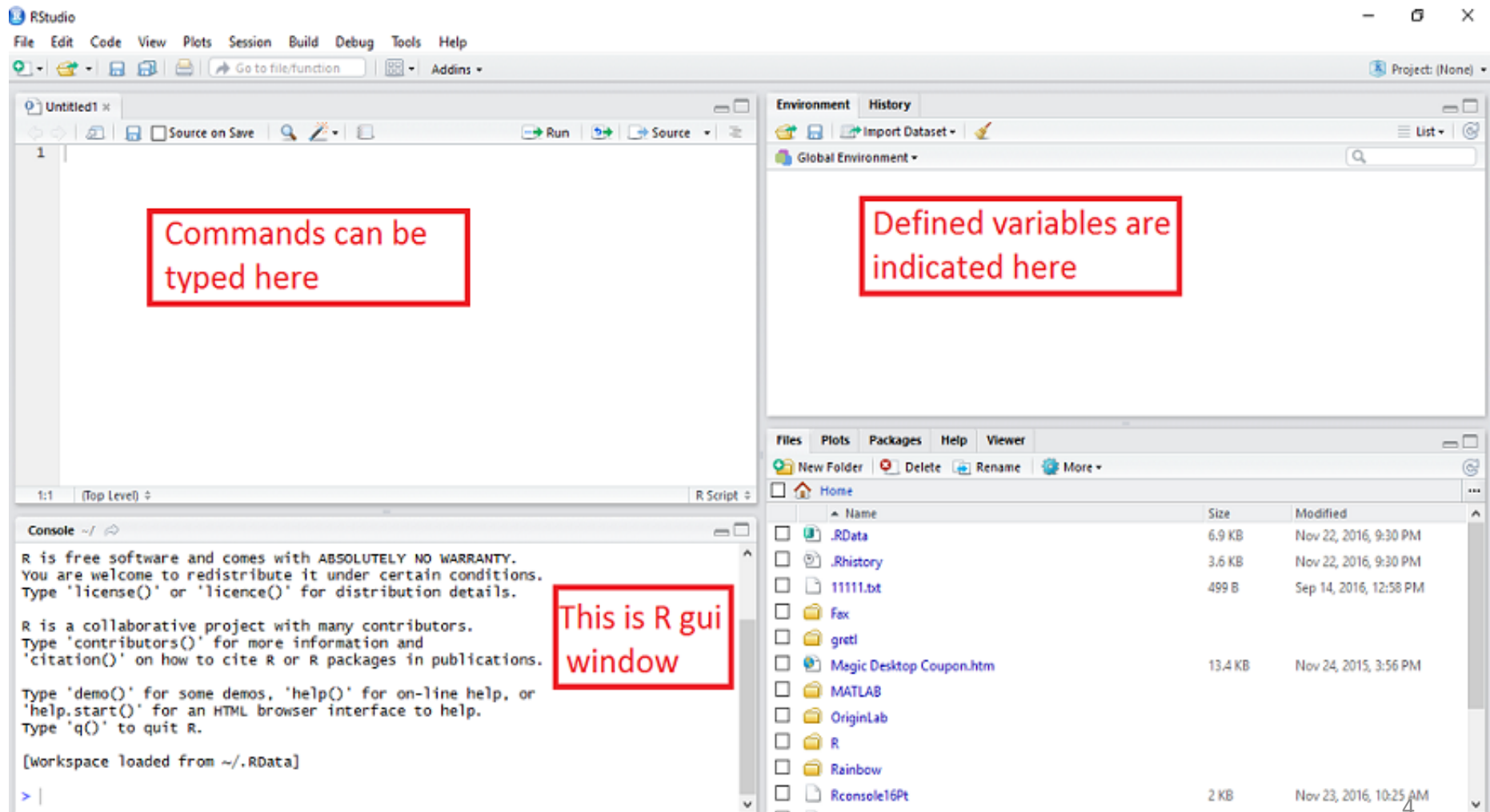
RStudio Server
Open Source License
Free

RStudio Workbench
Commercial License
\$4,975
/year
(5 Named Users)

Download and double click on the downloaded file.

Command Line versus Scripts

Use R Studio software.



Command Line versus Scripts

Suppose we want to use following three functions:

Type them.

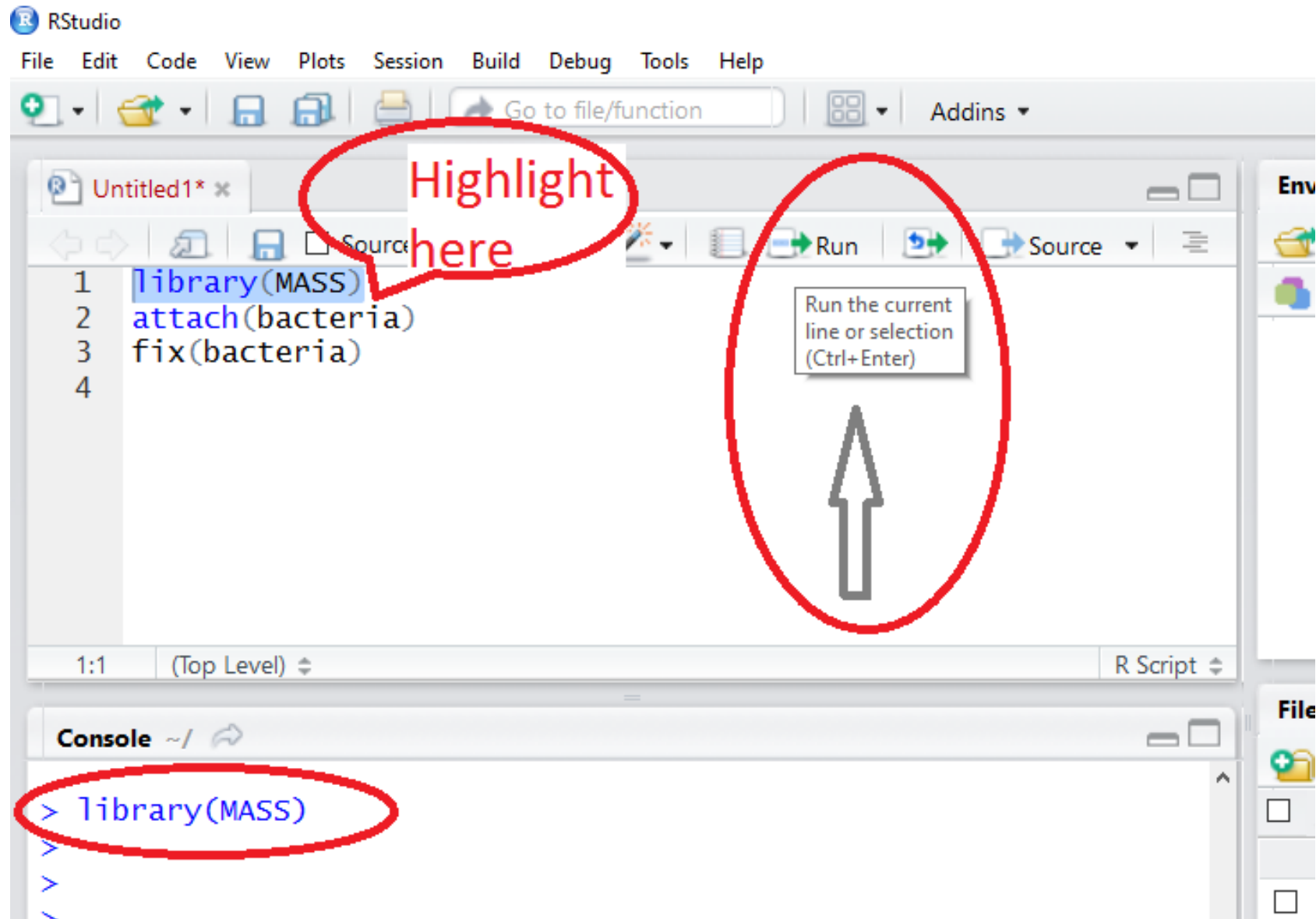
```
library(MASS)  
attach(bacteria)  
fix(bacteria)
```

Suppose we want to run only function: `library(MASS)`

Highlight it and click on **Run**

Then we get....

Command Line versus Scripts



Data Editor

There is a data editor within R that can be accessed from the menu bar by selecting Edit/Data editor.

Provide the name of the matrix or data frame that we want to edit and a **Data Editor** window appears.

Alternatively we can do this from the command line using the **fix** function.

Example:

```
library(MASS)  
attach(bacteria)  
fix(bacteria)
```

Data Editor

We can do it in R Studio as follows :

The screenshot shows the RStudio interface. The source editor window contains the following R code:

```
1 library(MASS)
2 attach(bacteria)
3 fix(bacteria)
```

A red circle highlights the `library(MASS)` line with the text "Highlight here".

The Data Editor window is open, displaying a table of data. The table has the following columns: y, ap, hilo, week, ID, and trt. The data is as follows:

	y	ap	hilo	week	ID	trt
1	y	p	hi	0	X01	placebo
2	y	p	hi	2	X01	placebo
3	y	p	hi	4	X01	placebo
4	y	p	hi	11	X01	placebo
5	y	a	hi	0	X02	drug+
6	y	a	hi	2	X02	drug+
7	n	a	hi	6	X02	drug+
8	y	a	hi	11	X02	drug+
9	y	a	lo	0	X03	drug
10	y	a	lo	2	X03	drug
11	y	a	lo	4	X03	drug
12	y	a	lo	6	X03	drug

A green arrow points to the "Data Editor" window with the text "Click here".

A green arrow points to the "Data Editor" window with the text "We get this window".

A green arrow points to the "Data Editor" window with the text "This is the data in MASS".

Introduction to R Studio

It is an interface between R and us.

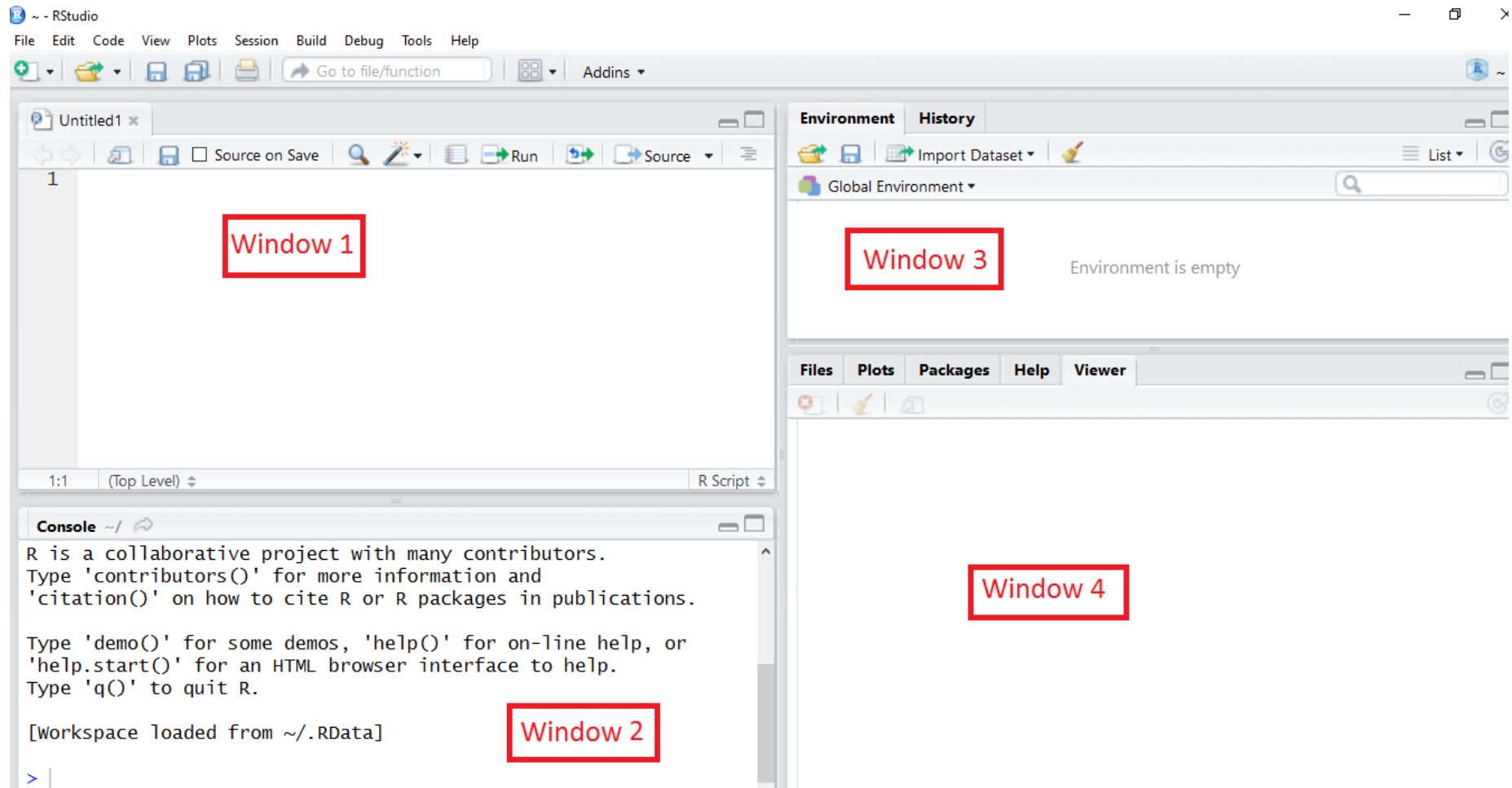
More useful for beginners.

It makes coding easier.

When we start R studio, we see 4 windows

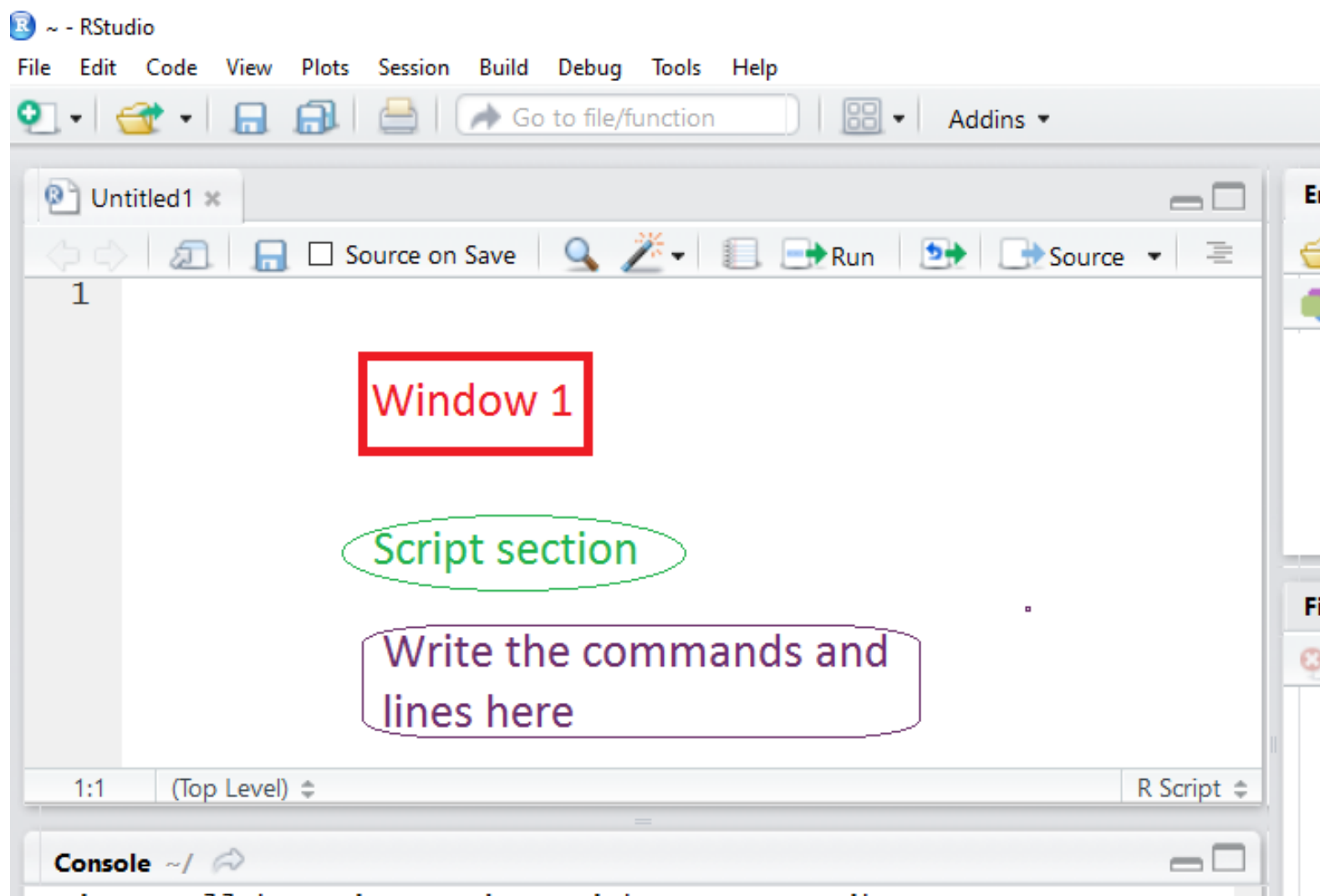
Introduction to R Studio

First opening window of Rstudio is as follows having four windows.



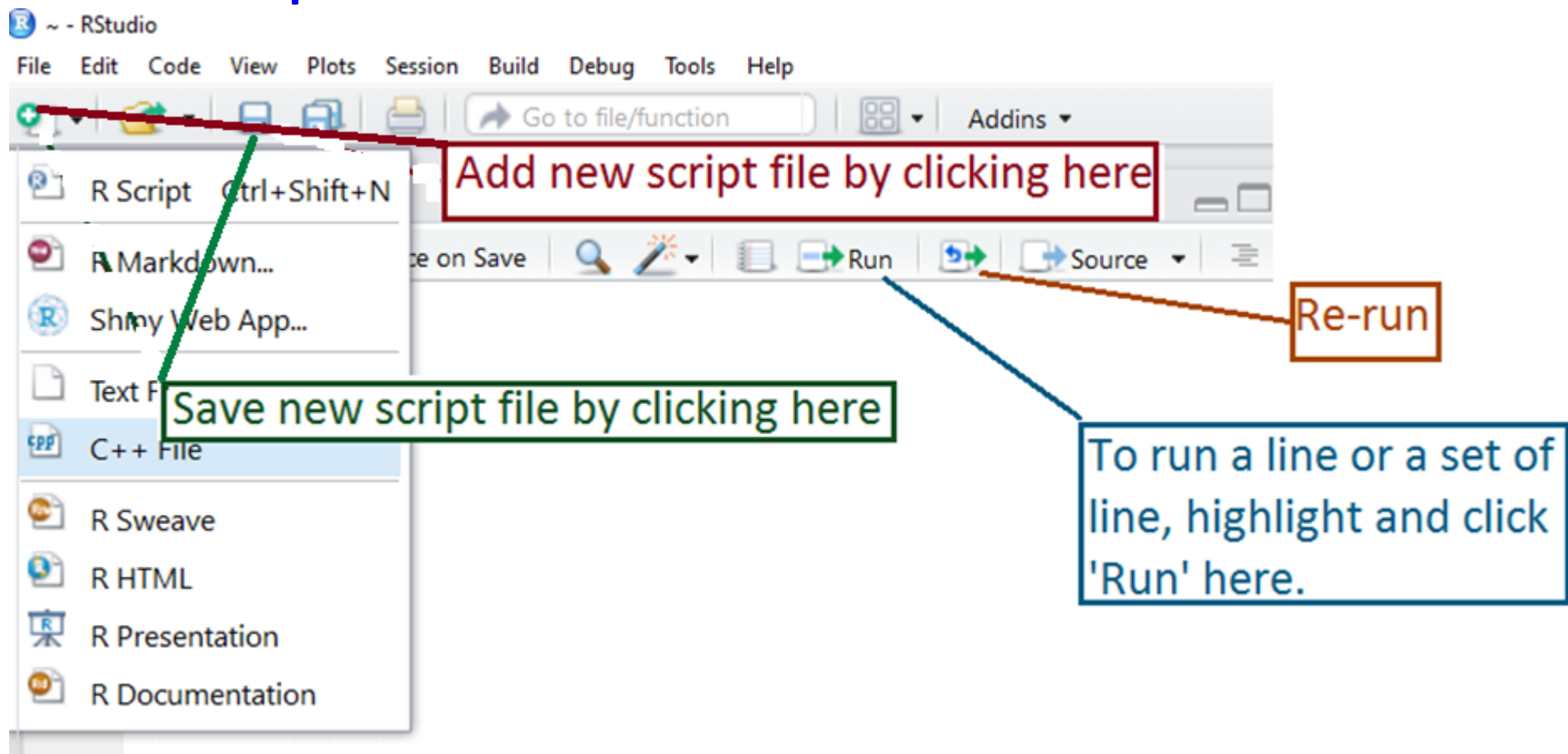
Introduction to R Studio

Description of Window 1



Introduction to R Studio

Description of Window 1



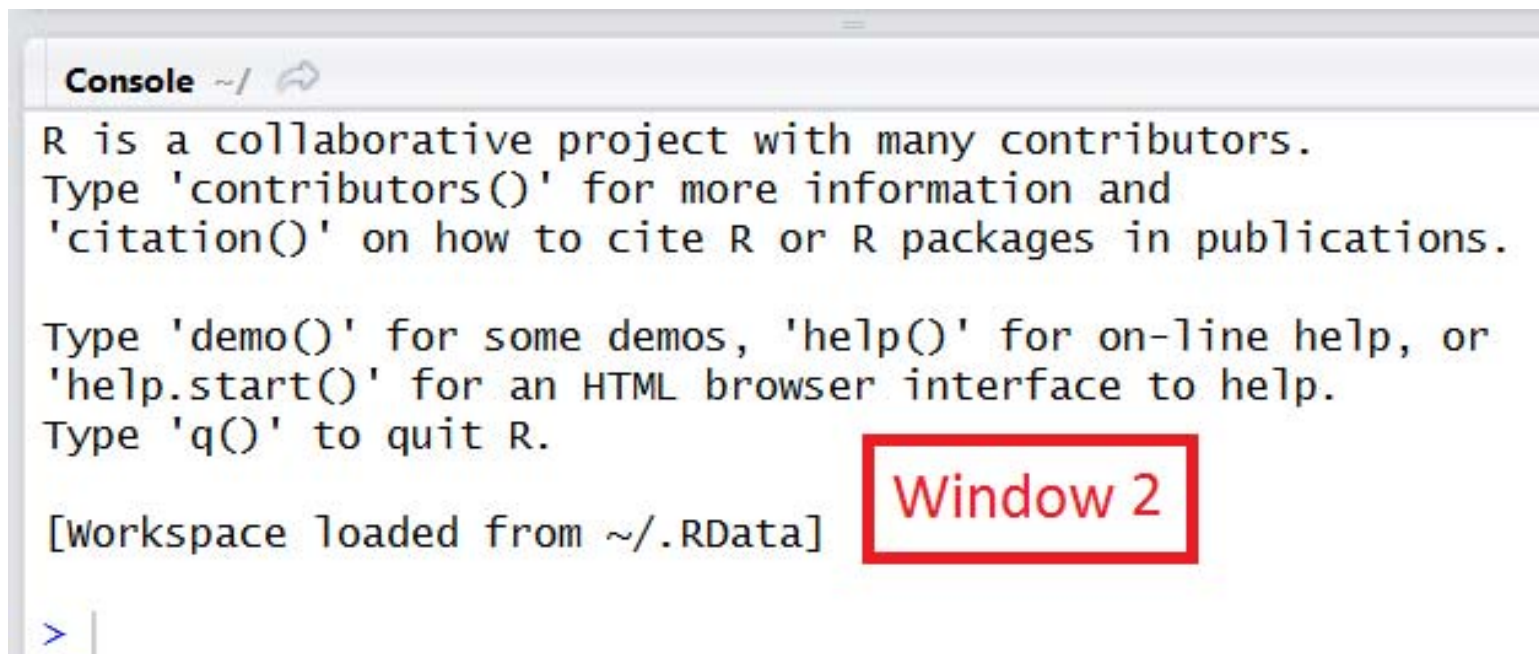
Introduction to R Studio

Description of Window 2 : Console

R program window appears here.

Calculations take place in console window.

One can write programmes in console also but it is hard to make corrections and experiments with the coding.



```
Console ~/   
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.  
  
[workspace loaded from ~/.RData]  
> |
```

Window 2

Introduction to R Studio

Description of Window 3 : Environment window

All the variables and objects used in the programme appear here.
The nature and values of variables and objects also appear here.

The screenshot shows the R Studio Environment window. At the top, there are two tabs: 'Environment' and 'History'. Below the tabs is a toolbar with icons for file operations and a button labeled 'Import Dataset'. A dropdown menu shows 'Global Environment'. Below this is a table titled 'values' with two columns. The first column contains the variable name 'x' and the second column contains its value '1'. Several callout boxes provide additional information: an orange box points to the 'History' tab with the text 'History tells about the codes used earlier.'; a blue box points to the 'Import Dataset' button with the text 'Data can be imported from other files by clicking here'; a blue box points to the 'x' variable in the table with the text 'Stored value can be erased from here'; and a green box points to the value '1' in the table with the text 'The stored value x = 1 appears here'. A red box at the bottom left of the screenshot is labeled 'Window 3'.

Environment History

Import Dataset

Global Environment

values

x	1
---	---

History tells about the codes used earlier.

Stored value can be erased from here

The stored value x = 1 appears here

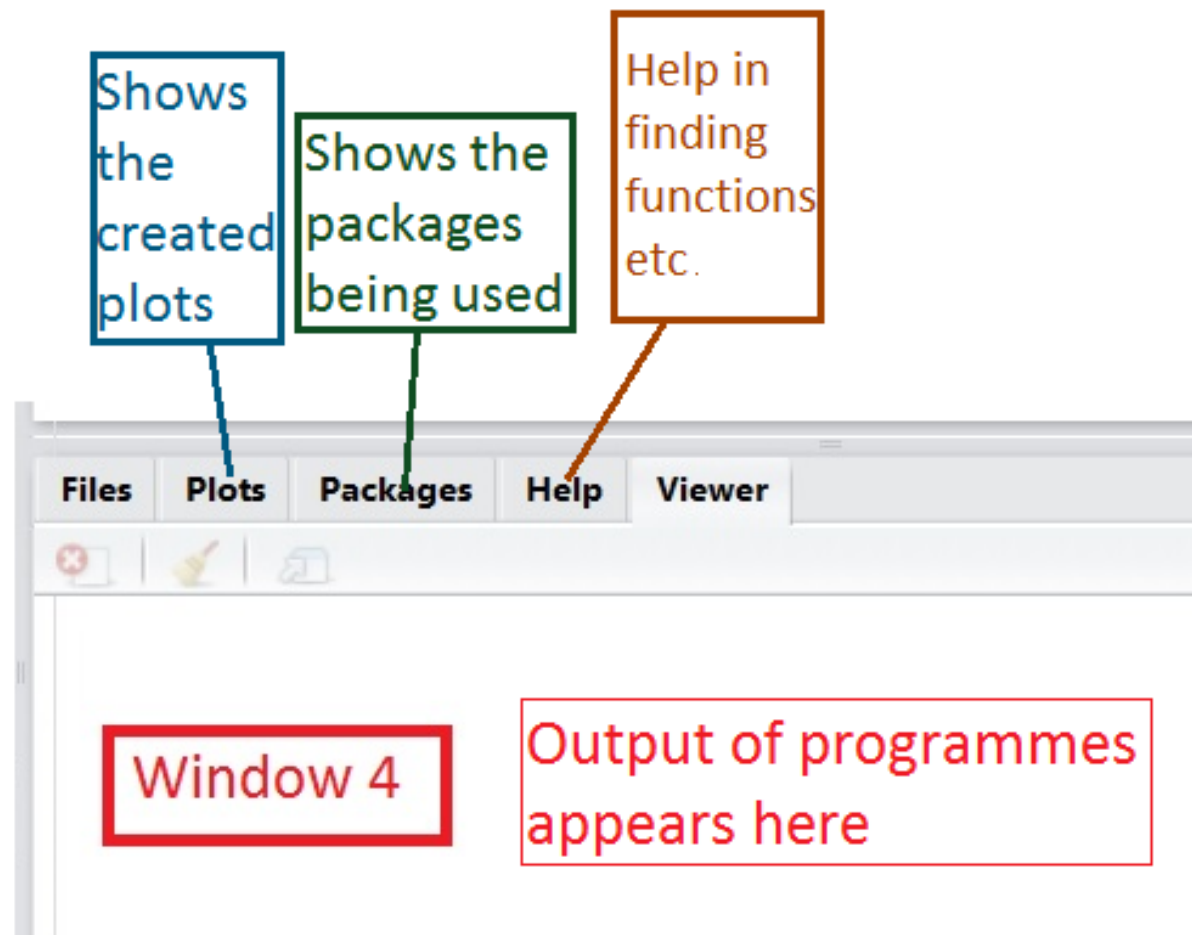
Window 3

Data can be imported from other files by clicking here

Introduction to R Studio

Description of Window 4 : Output window

The output of programmes appears in this window.



Introduction to R Studio

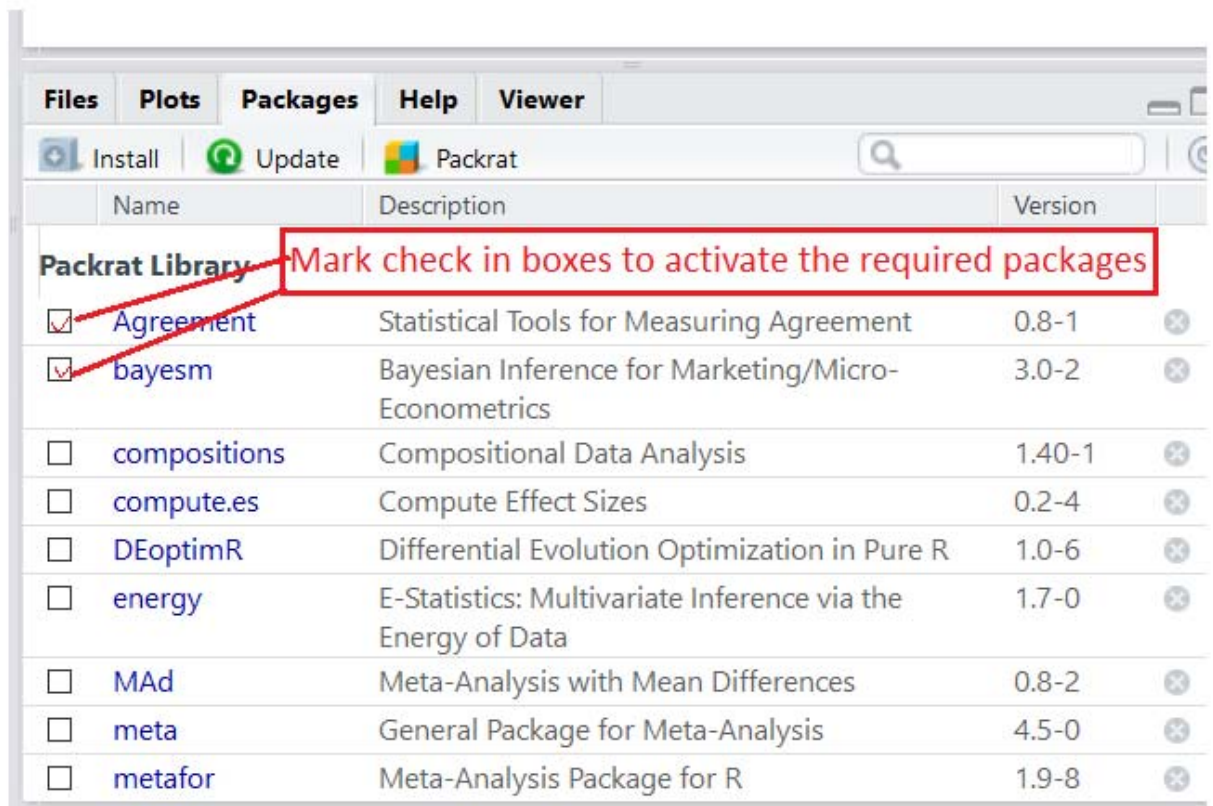
Description of Window 4 : Output window

Packages:

All the packages being installed appear here.

Packages are not active.

Check mark in the boxes to activate them.



Introduction to R Studio

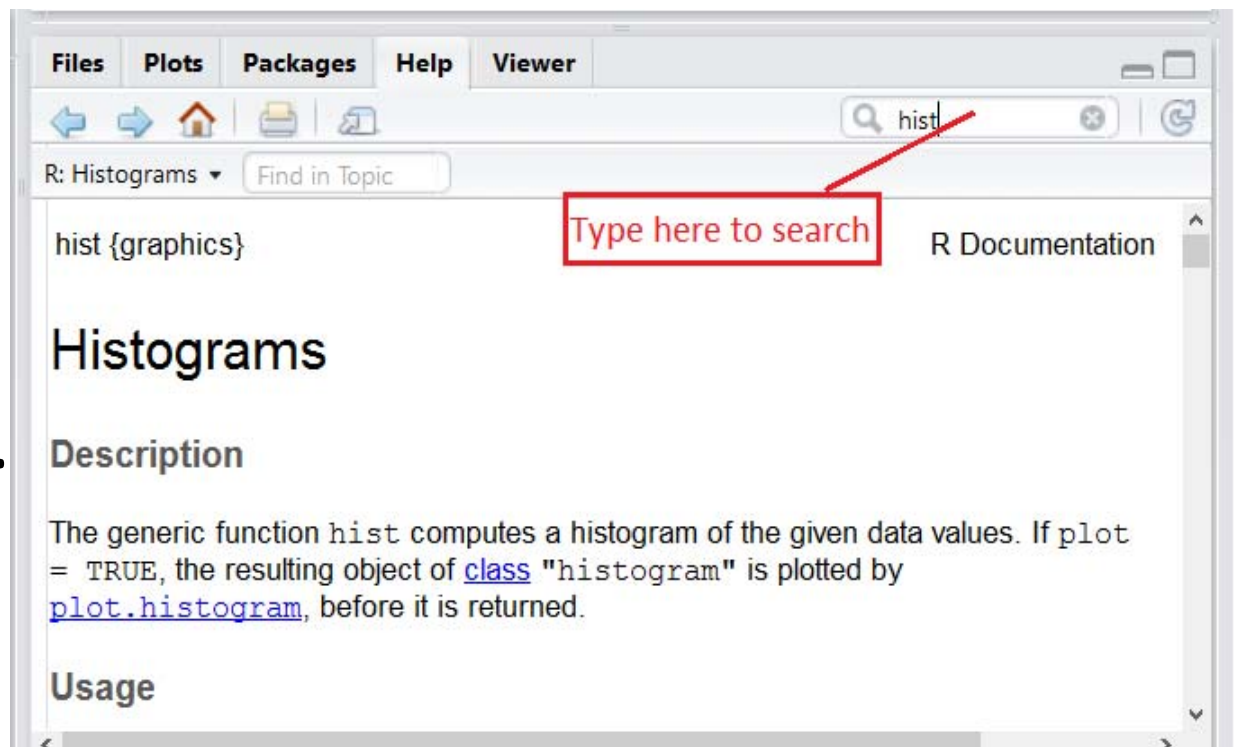
Window 4 : Output window

Help:

Various types of help can be asked.

E.g., to know about histogram,
type **hist**.

Information appears.



Introduction to R Studio

Example:

Bar diagram of values 1,2,1,1,2,3,1,2,3,1,2,2,3

R studio has following operation and output:

Introduction to R Studio

Example:

Bar diagram of values

```
x = c(1,2,1,1,2,3,1,2,3,1,2,2,3)  
barplot(table(x))
```

R studio has following operation and output: