

Introduction to R

In this lecture

- R and RStudio
- How to
 - set the working directory
 - create an R file and save it
 - execute an R file
 - execute pieces of code

R

- Open source programming language
- Statistical software and Data analysis tool
- Interface
 - Command line user interface
- Platforms
 - Windows, Linux and Mac OS

RStudio

- Integrated Development Environment (IDE) for R
- Availability
 - Open source
 - Commercial
- Editions
 - Desktop
 - Server
- Platforms
 - Windows, Linux and Mac OS

A first look of RStudio

The screenshot shows the RStudio application window. The top menu bar includes File, Edit, Code, View, Plots, Session, Build, Debug, Profile, Tools, and Help. Below the menu is a toolbar with icons for file operations and a search bar. The main workspace is divided into three panels:

- Console:** Located on the left, it displays the R version 3.4.0 (2017-04-21) and copyright information. It also shows the R license and a list of contributors. The prompt is `> |`.
- Environment/History:** Located on the top right, it shows the Global Environment and is currently empty.
- Files/Plots/Packages/Help:** Located on the bottom right, it shows a file explorer view of the Home directory. The file list includes:

Name	Size	Modified
(Heat and Mass Transfer) Prof. Dipl.-...	5.8 MB	May 17, 2016, 10:40 AM
(Oxford Applied Mathematics and C...	2.9 MB	Jul 21, 2016, 2:32 PM
.Rhistory	439 B	May 29, 2017, 3:47 PM
0513.pdf	82.1 KB	Jun 24, 2016, 10:48 AM
Book1.xlsx	14 KB	Jun 21, 2016, 11:10 AM
BOOK6.pdf	5.3 MB	Jul 21, 2016, 2:57 PM
Criterion Games		
Custom Office Templates		

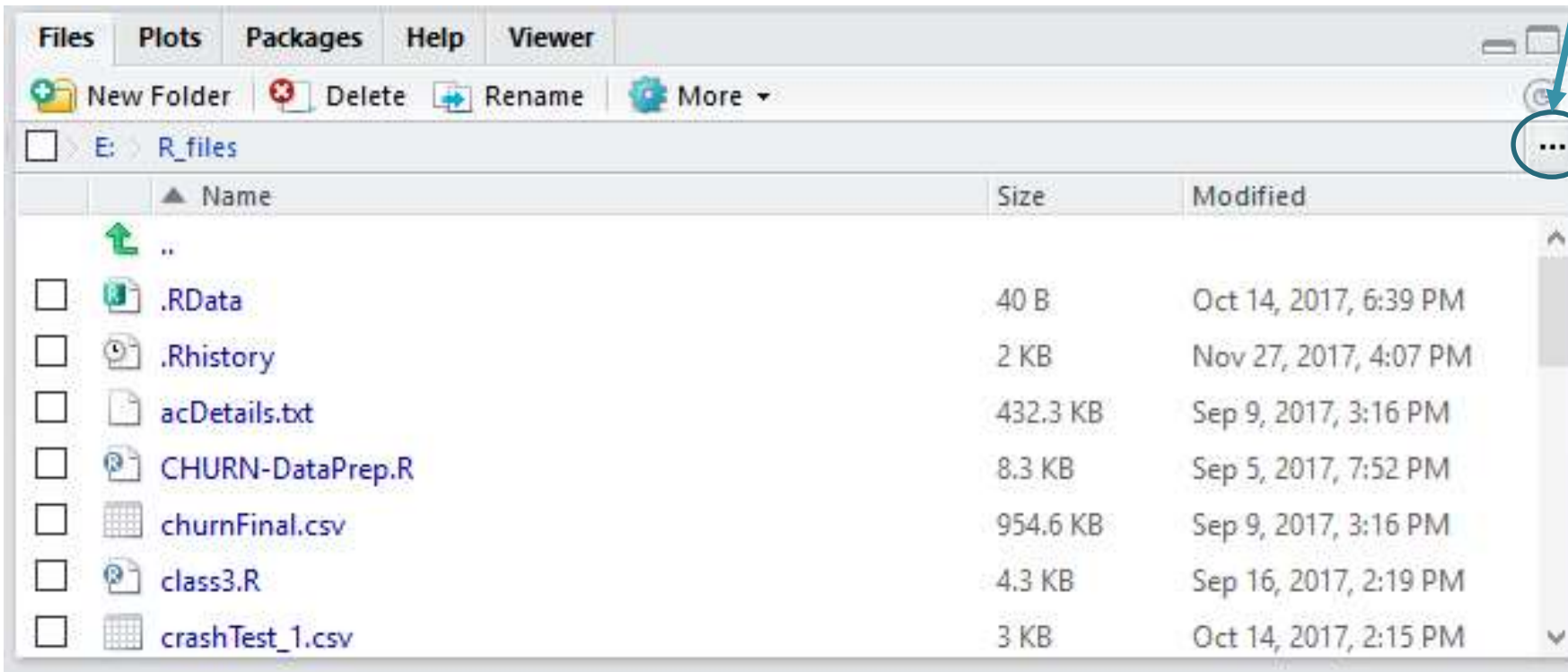
Set the working directory

Enter in the console : `setwd(“directorypath”)`

(OR)

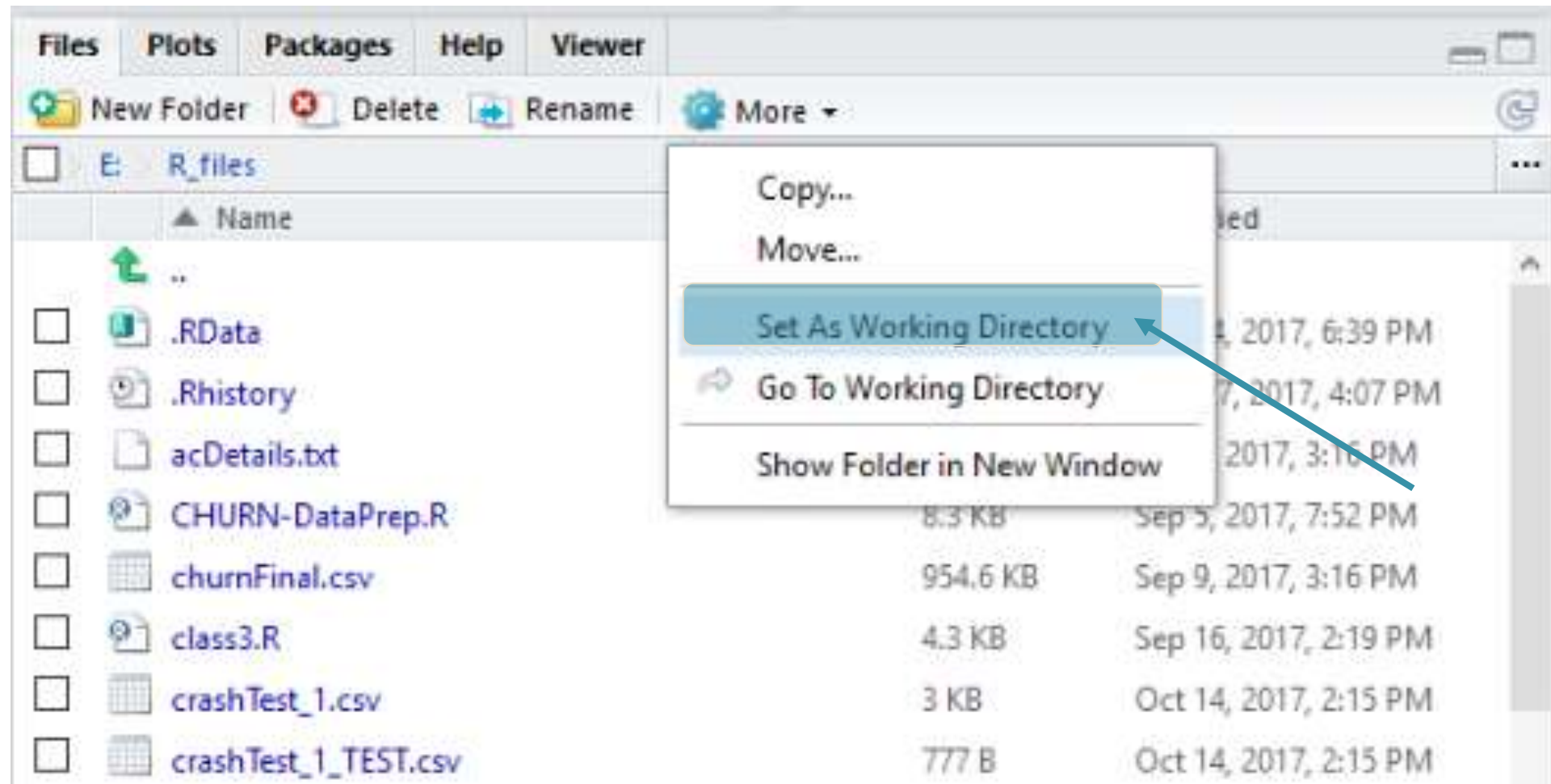
*To choose Working
directory*

STEP 1: Choose a suitable location by clicking on the indicated icon

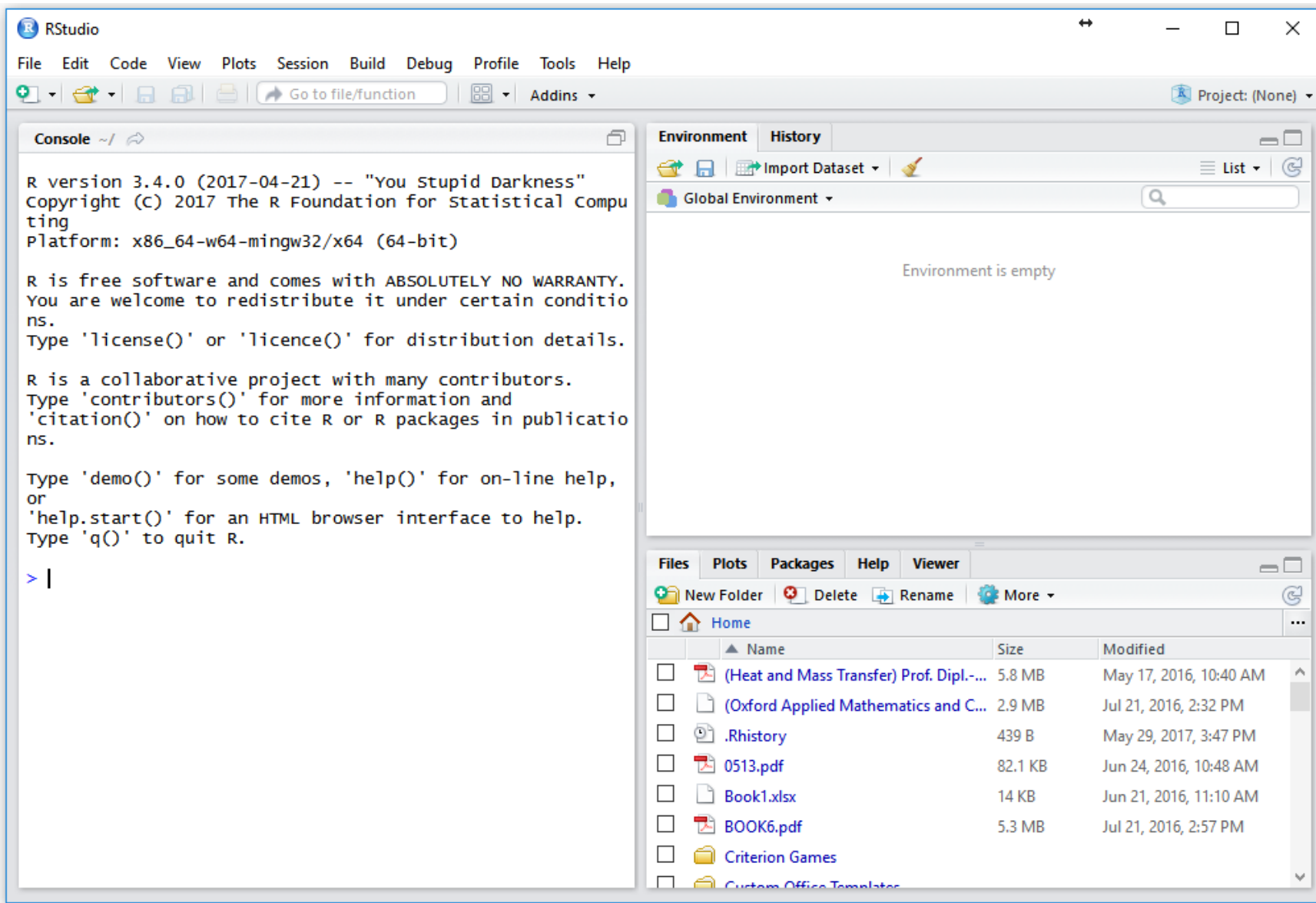


Set the working directory

STEP 2: Once directory is chosen, select the more icon and choose “Set as Working Directory”

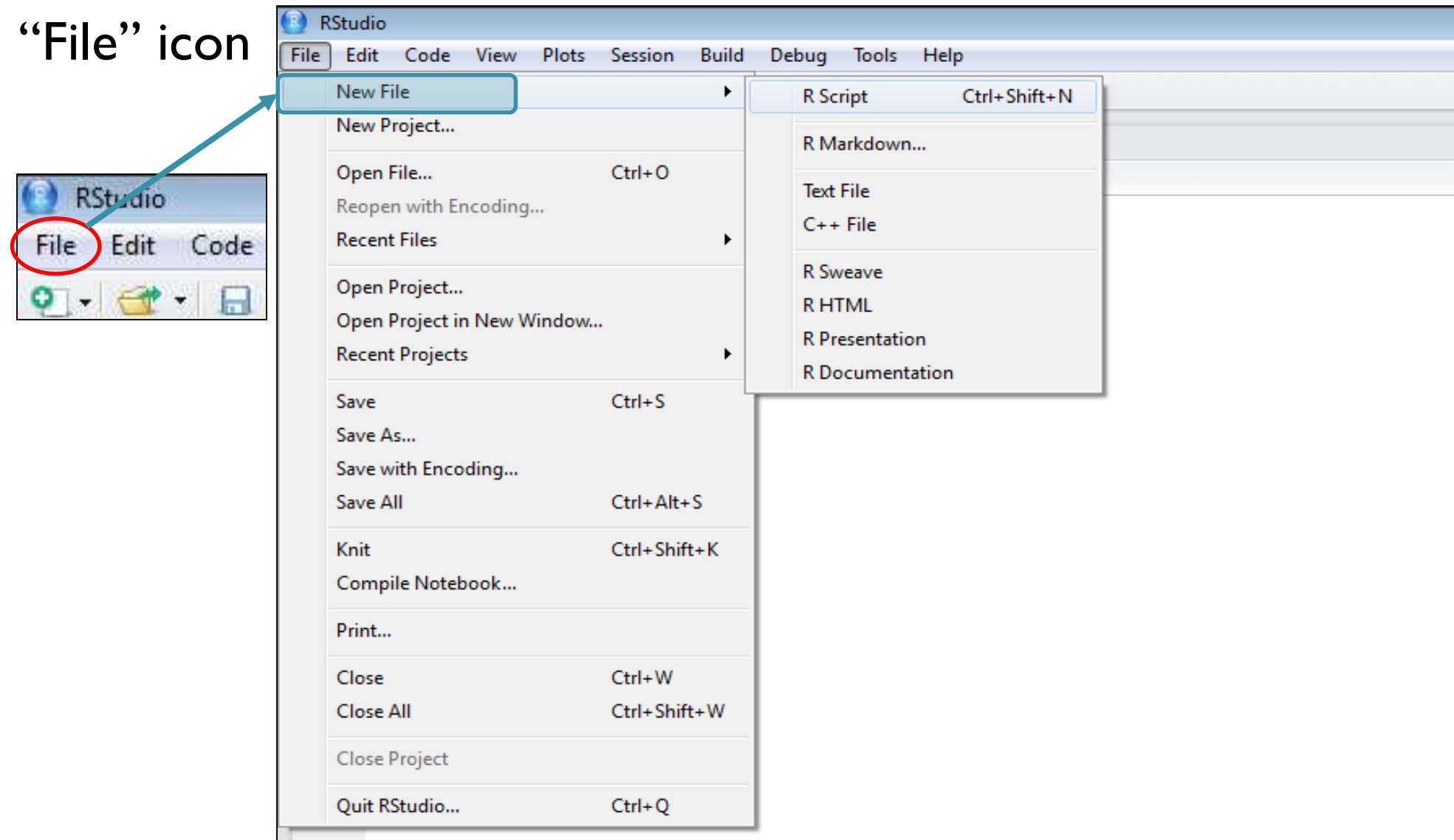


RStudio



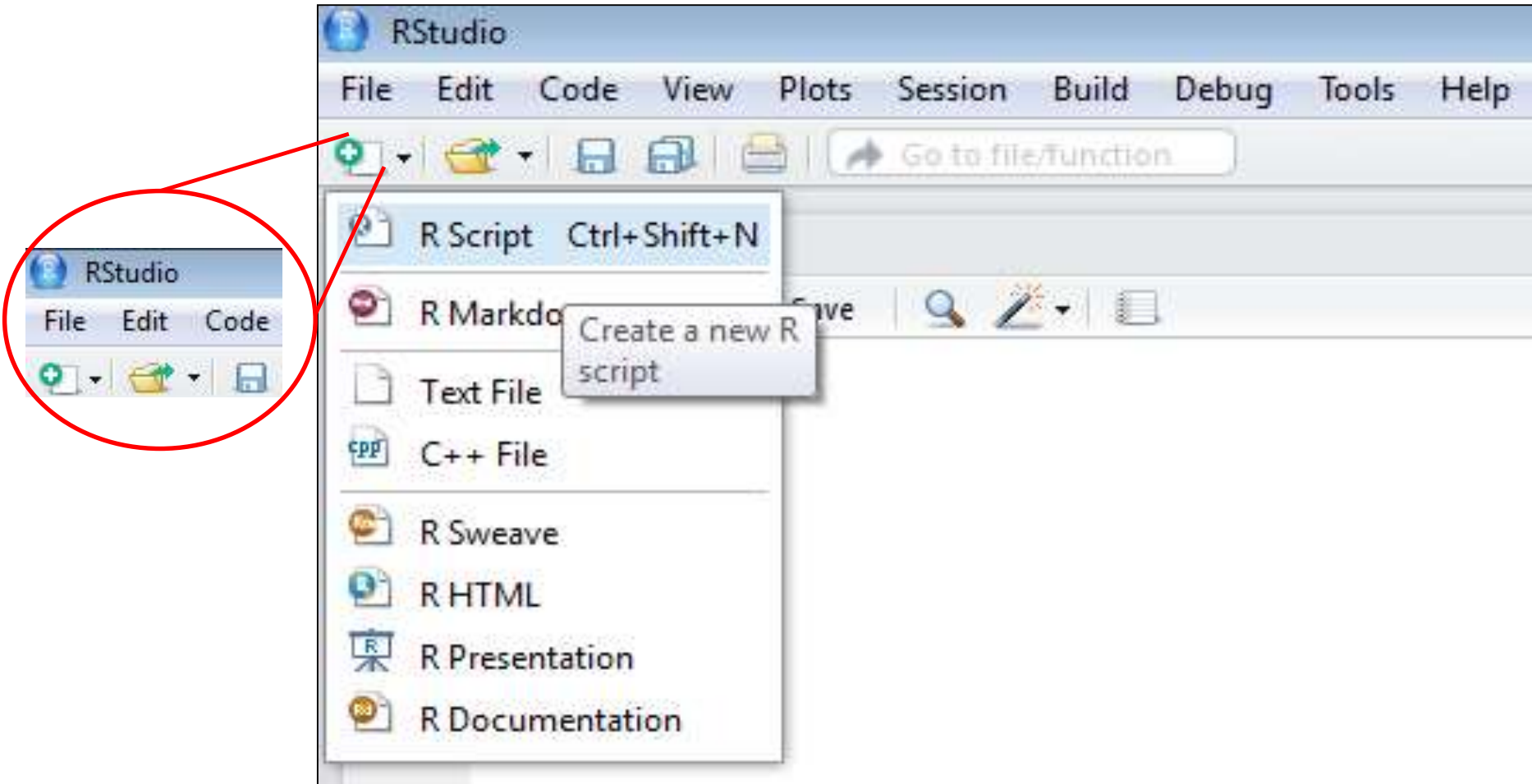
Create an R file

“File” icon

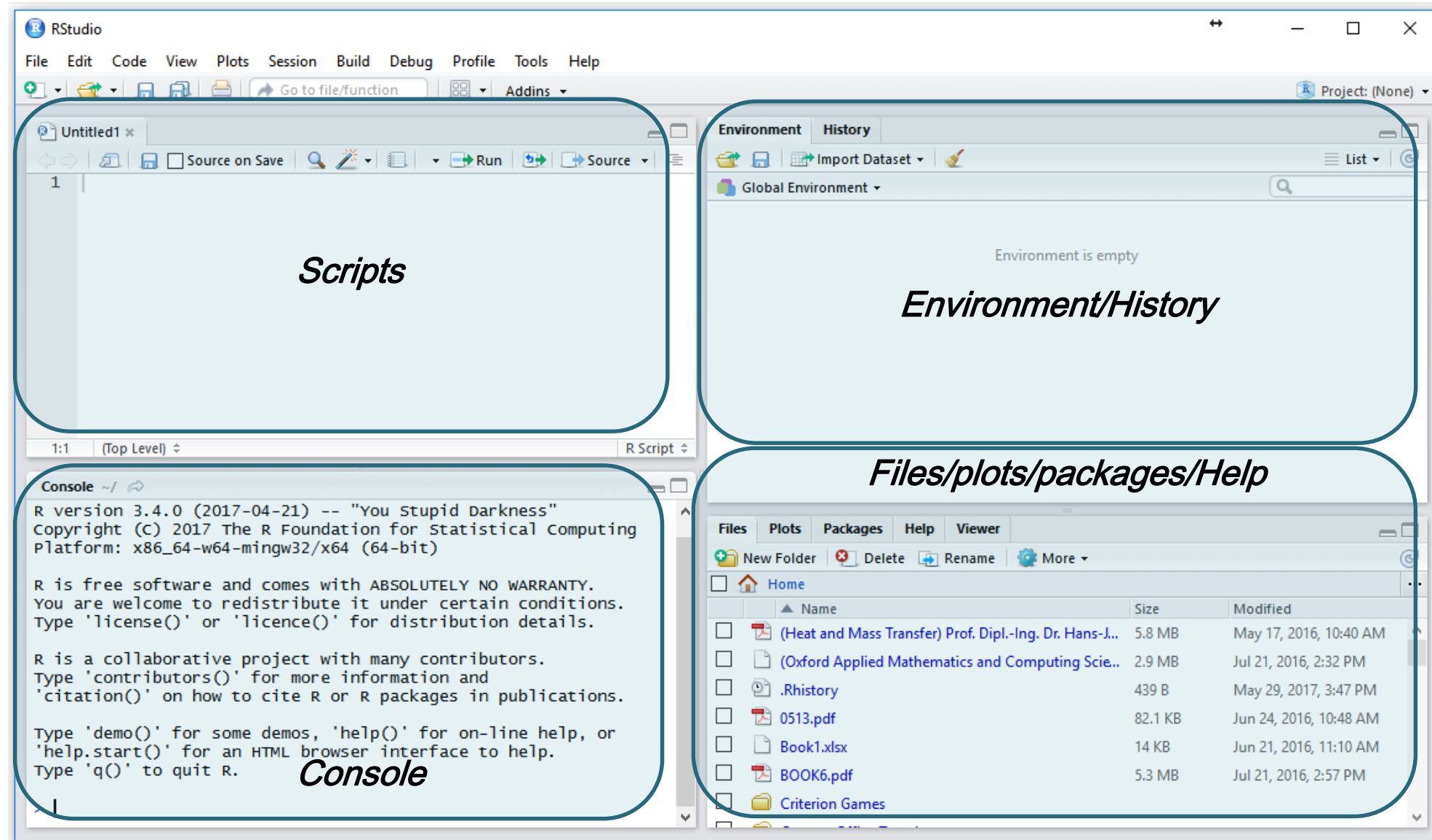


Create an R file

By clicking the icon “  ”below the toolbar



RStudio with script file open



Writing scripts

The screenshot displays the RStudio IDE interface. The top menu bar includes File, Edit, Code, View, Plots, Session, Build, Debug, Profile, Tools, and Help. Below the menu is a toolbar with icons for file operations and a search bar labeled 'Go to file/function'. The main editor window shows a script named 'Untitled1*' with the following code:

```
1
2 a = 11
3 b = a*10
4 print(c(a,b))
```

The status bar at the bottom of the editor indicates '4:14 (Top Level)' and 'R Script'.

The right-hand pane contains the 'Environment' and 'History' tabs. The 'Environment' tab is active, showing 'Global Environment' and a search bar. Below this, it states 'Environment is empty'.

The bottom-left pane is the 'Console', showing the R version and platform information:

```
R version 3.4.0 (2017-04-21) -- "You Stupid Darkness"
Copyright (C) 2017 The R Foundation for Statistical Computing
Platform: x86_64-w64-mingw32/x64 (64-bit)

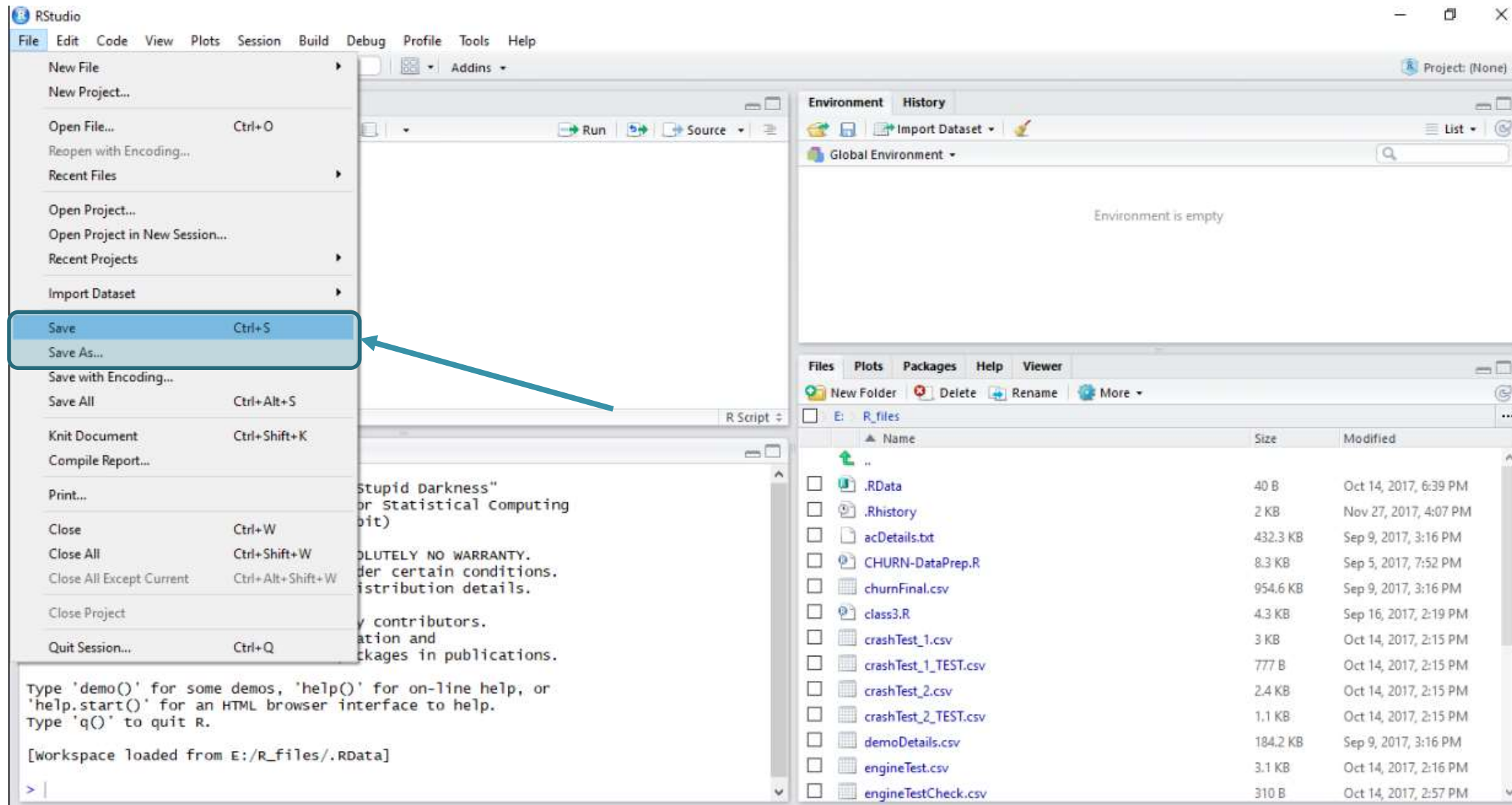
R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.

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.
```

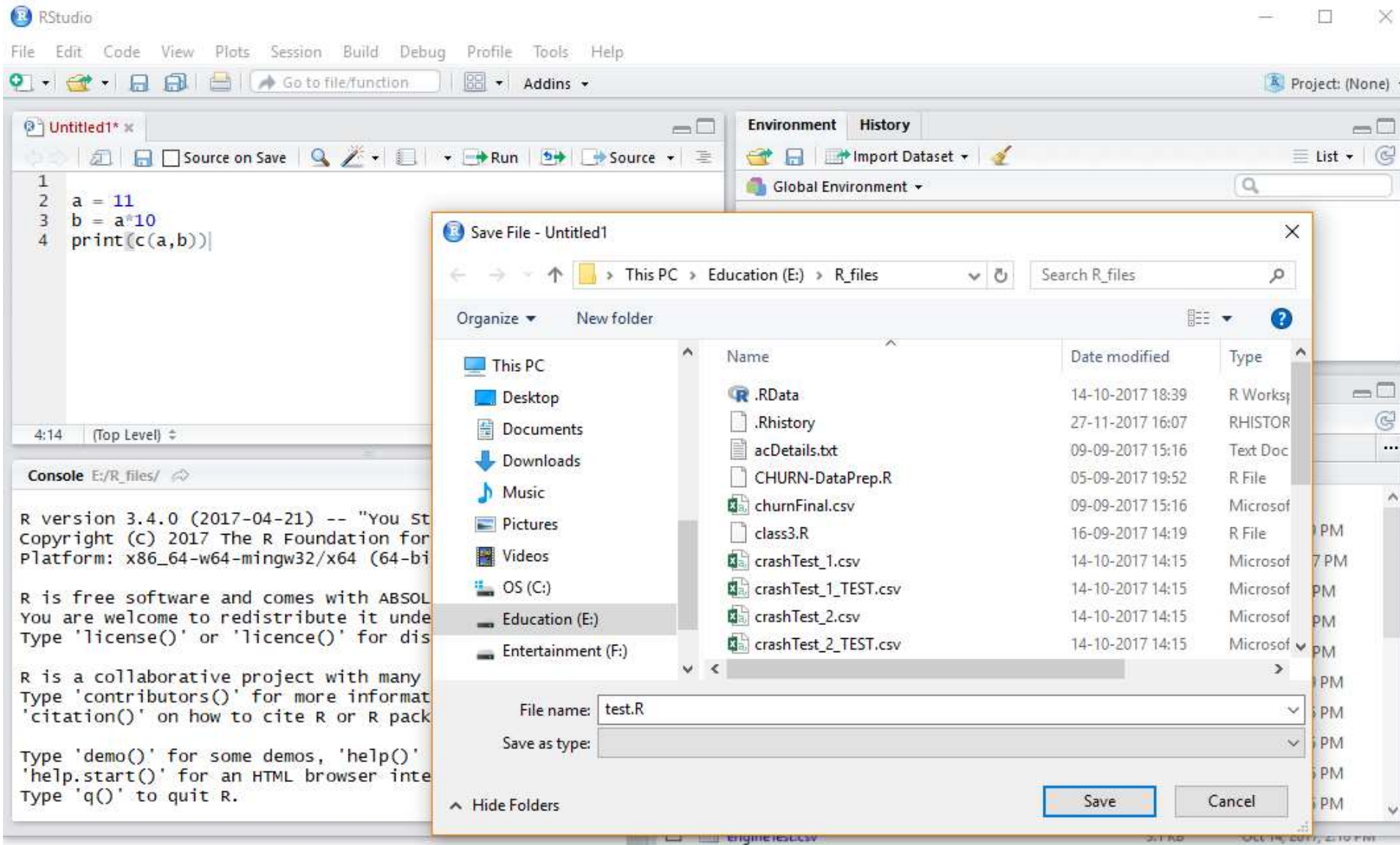
The bottom-right pane is the 'Files' tab, showing a file explorer view of the directory 'E:\R_files'. The files listed are:

Name	Size	Modified
..		
.RData	40 B	Oct 14, 2017, 6:39 PM
.Rhistory	2 KB	Nov 27, 2017, 4:07 PM
acDetails.txt	432.3 KB	Sep 9, 2017, 3:16 PM
CHURN-DataPrep.R	8.3 KB	Sep 5, 2017, 7:52 PM
churnFinal.csv	954.6 KB	Sep 9, 2017, 3:16 PM
class3.R	4.3 KB	Sep 16, 2017, 2:19 PM
crashTest_1.csv	3 KB	Oct 14, 2017, 2:15 PM
crashTest 1 TEST.csv	777 B	Oct 14, 2017, 2:15 PM

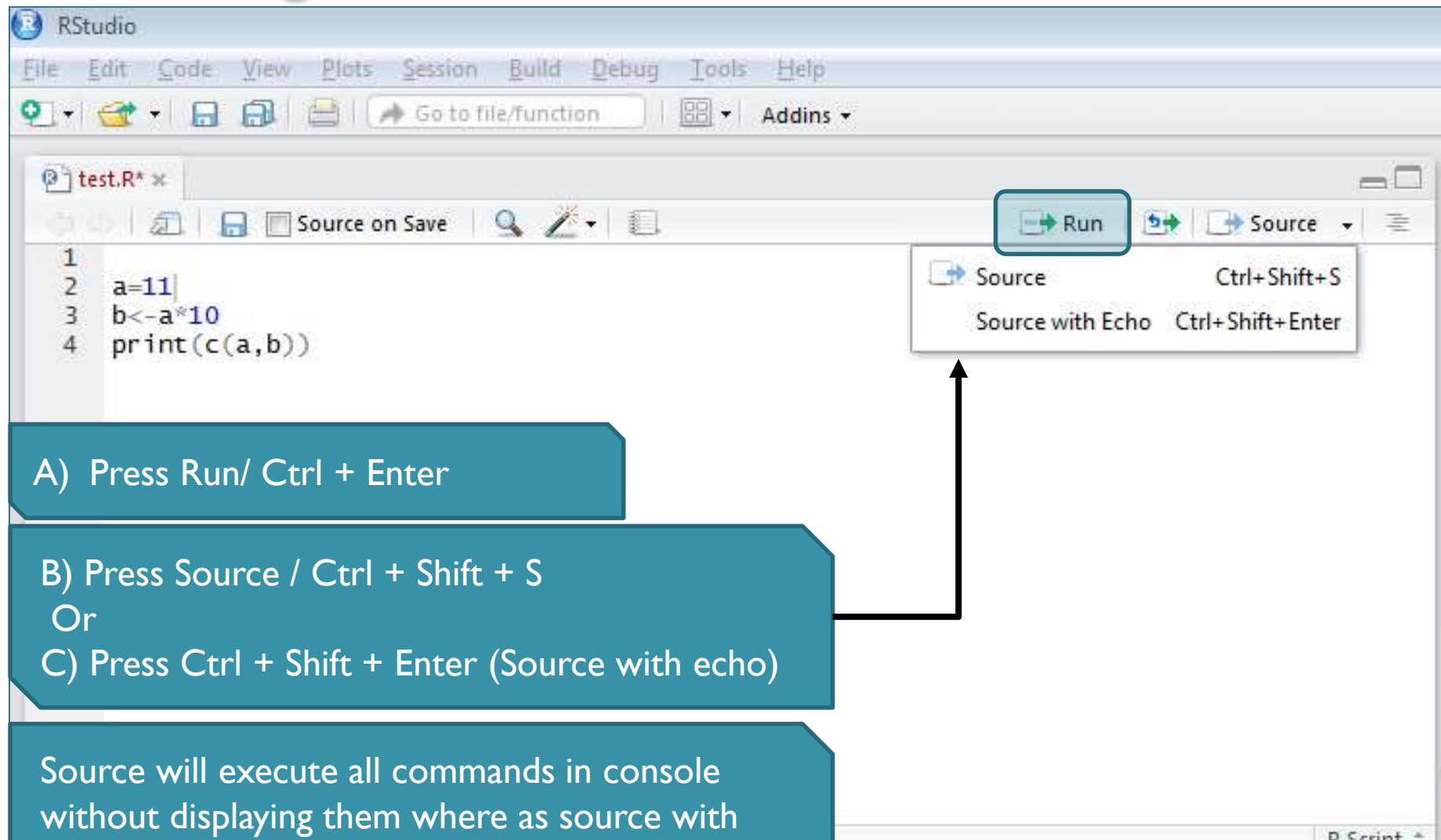
Saving R script file



Saving R script file



Executing an R file



A) Press Run/ Ctrl + Enter

B) Press Source / Ctrl + Shift + S

Or

C) Press Ctrl + Shift + Enter (Source with echo)

Source will execute all commands in console without displaying them where as source with echo will execute and print automatically

Executing an R file: Example

RStudio

File Edit Code View Plots Session Build Debug Profile Tools Help

Go to file/function Addins Project: (None)

test.R ×

```

1
2 a = 11
3 b = a*10
4 print(c(a,b))

```

4:14 (Top Level) R Script

Environment History

Global Environment

values

Variable	Value
a	11
b	110

Files Plots Packages Help Viewer

New Folder Delete Rename More

E: R_files

Name	Size	Modified
..		
.RData	40 B	Oct 14, 2017, 6:39 P
.Rhistory	2 KB	Nov 27, 2017, 4:07
acDetails.txt	432.3 KB	Sep 9, 2017, 3:16 P
CHURN-DataPrep.R	8.3 KB	Sep 5, 2017, 7:52 P
churnFinal.csv	954.6 KB	Sep 9, 2017, 3:16 P
class3.R	4.3 KB	Sep 16, 2017, 2:19 P
crashTest_1.csv	3 KB	Oct 14, 2017, 2:15 P
crashTest_1_TEST.csv	777 B	Oct 14, 2017, 2:15 P
crashTest_2.csv	2.4 KB	Oct 14, 2017, 2:15 P

Console E:/R_files/

OR
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.

[workspace loaded from E:/R_files/.RData]

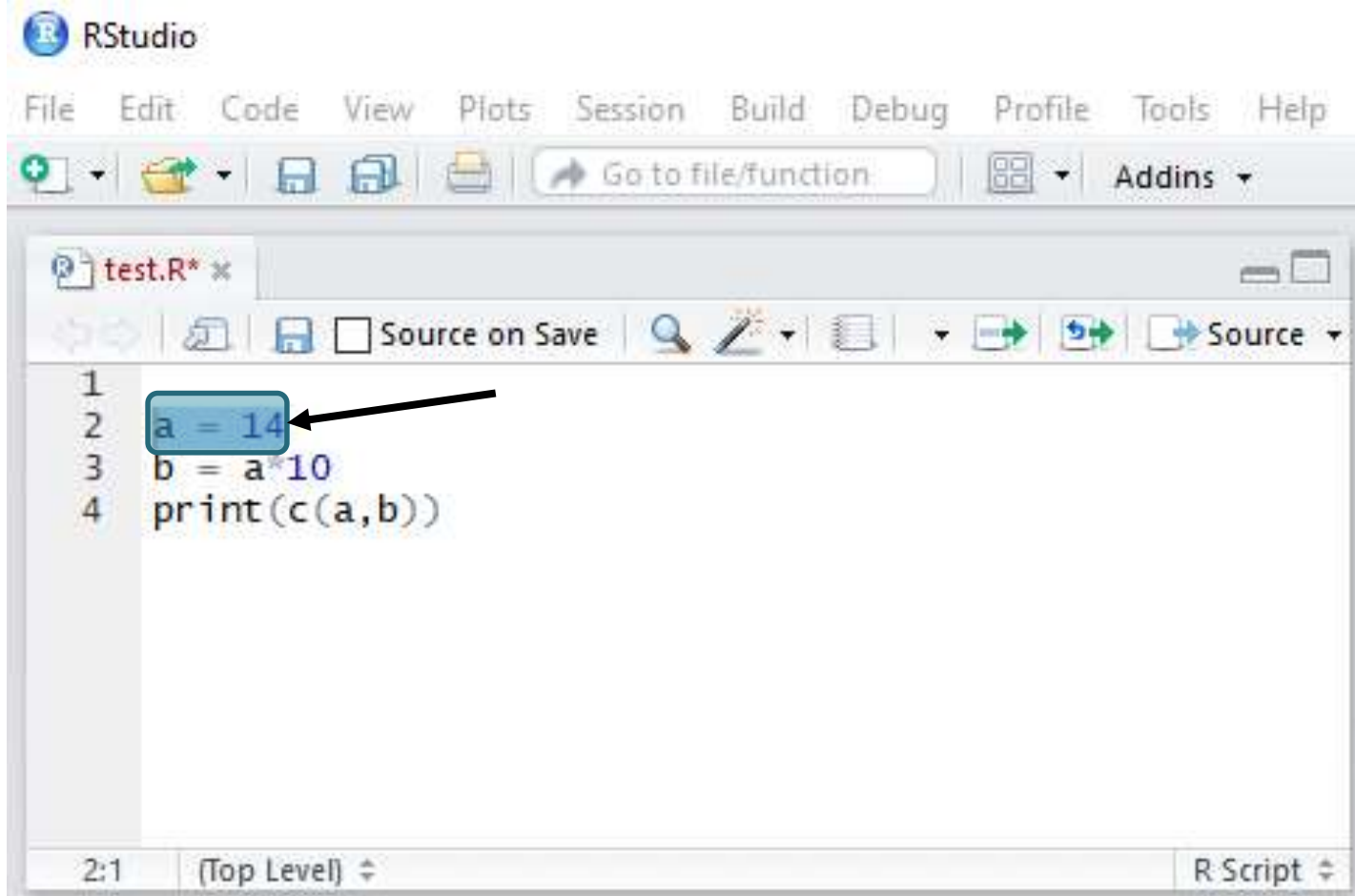
```

> source('E:/R_files/test.R', echo=TRUE)
> a = 11
> b = a*10
> print(c(a,b))
[1] 11 110
>

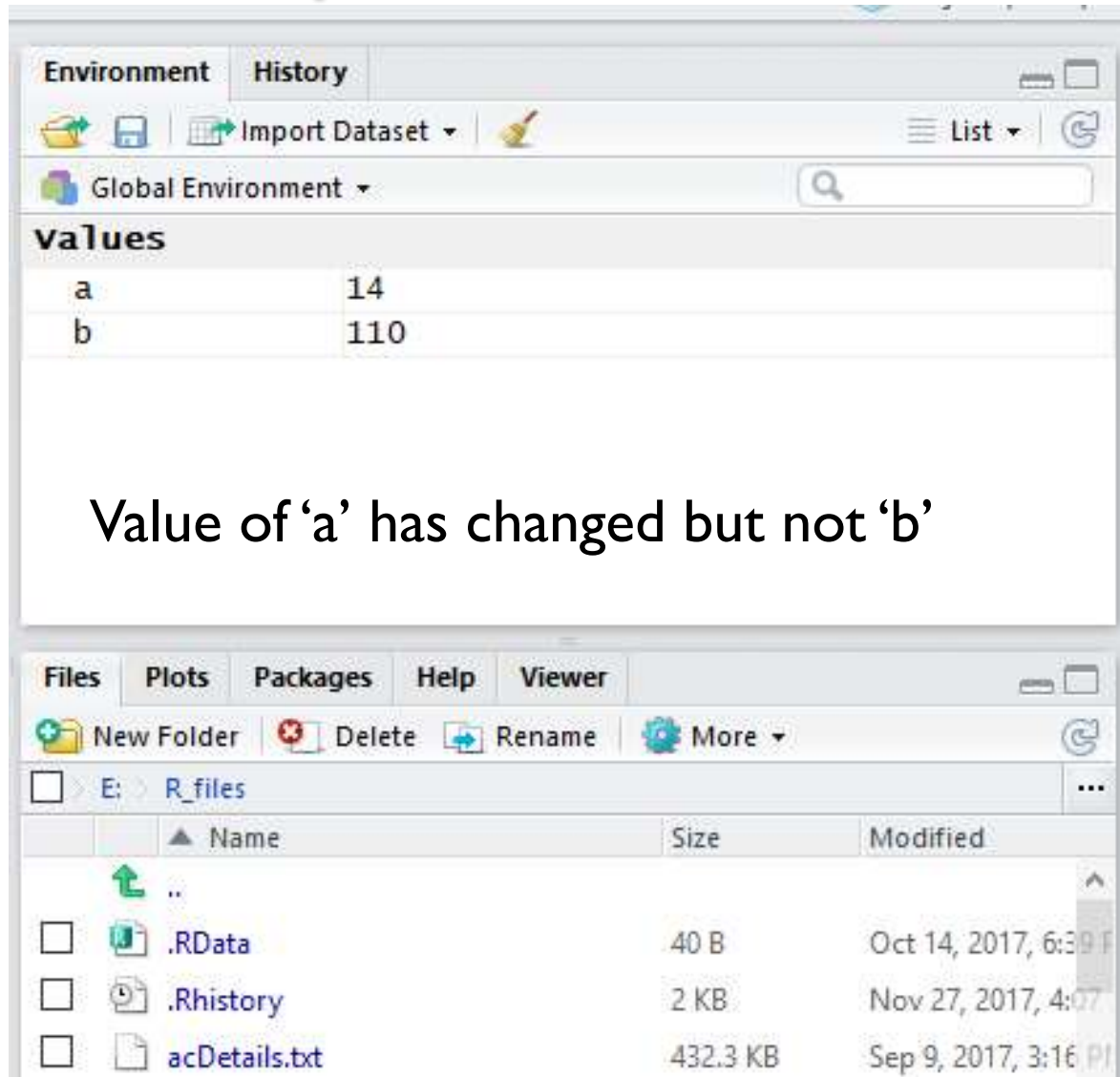
```

RESULT

Execute pieces of code – Run



Execute pieces of code – Run



The screenshot shows the RStudio interface. The top pane, titled 'Environment', displays the 'Global Environment' with a search bar and a table of values. The table has two rows: 'a' with value 14 and 'b' with value 110. The bottom pane, titled 'Files', shows the file explorer for the directory 'E:\R_files'. It contains a table with columns 'Name', 'Size', and 'Modified'. The files listed are '..' (parent directory), '.RData' (40 B, Oct 14, 2017, 6:39 PM), '.Rhistory' (2 KB, Nov 27, 2017, 4:07 PM), and 'acDetails.txt' (432.3 KB, Sep 9, 2017, 3:16 PM).

values	
a	14
b	110

Value of 'a' has changed but not 'b'

Name	Size	Modified
..		
.RData	40 B	Oct 14, 2017, 6:39 PM
.Rhistory	2 KB	Nov 27, 2017, 4:07 PM
acDetails.txt	432.3 KB	Sep 9, 2017, 3:16 PM

Executing R files – Summary

- Run can be used to execute selected lines
- Source/ Source with echo is for a whole file
- Advantages – using Run :
 - troubleshooting/debugging
- Disadvantages – using Run :
 - For large section, console will be over populated and messy