Introduction to RStudio

(*v 3.6*)

Oscar Torres-Reyna

otorres@princeton.edu

First published: August 2013

http://www.princeton.edu/~otorres/

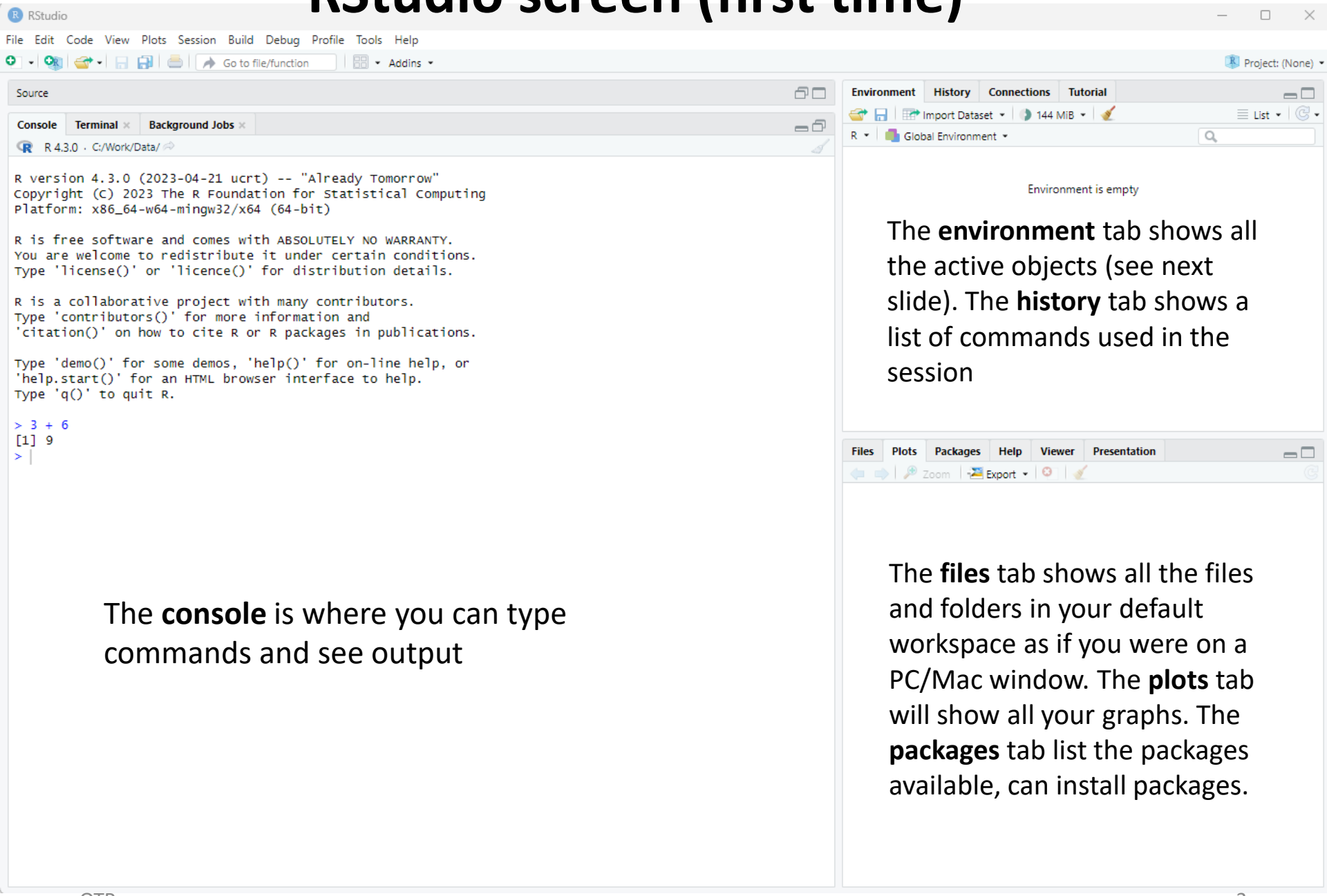
Installing RStudio

1. Download and install R, see here: https://cran.r-project.org/

2. Download and install RStudio Desktop (free version), see here: https://posit.co/download/rstudio-desktop/

If RStudio does not recognized the latest installed version of R, see here: https://support.posit.co/hc/en-us/articles/200486138-Using-Different-Versions-of-R

RStudio screen (first time)

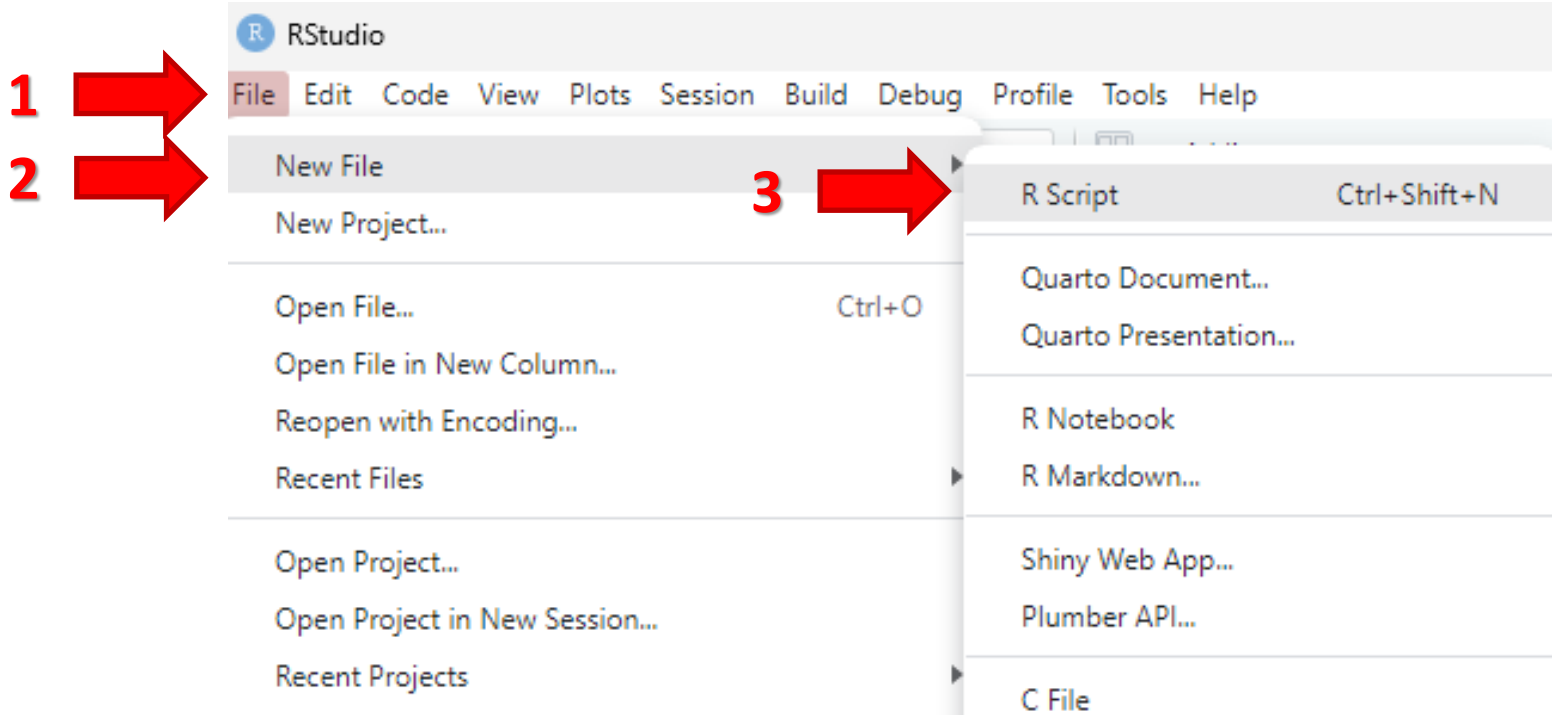


The **console** is where you can type commands and see output

The **environment** tab shows all the active objects (see next slide). The **history** tab shows a list of commands used in the session

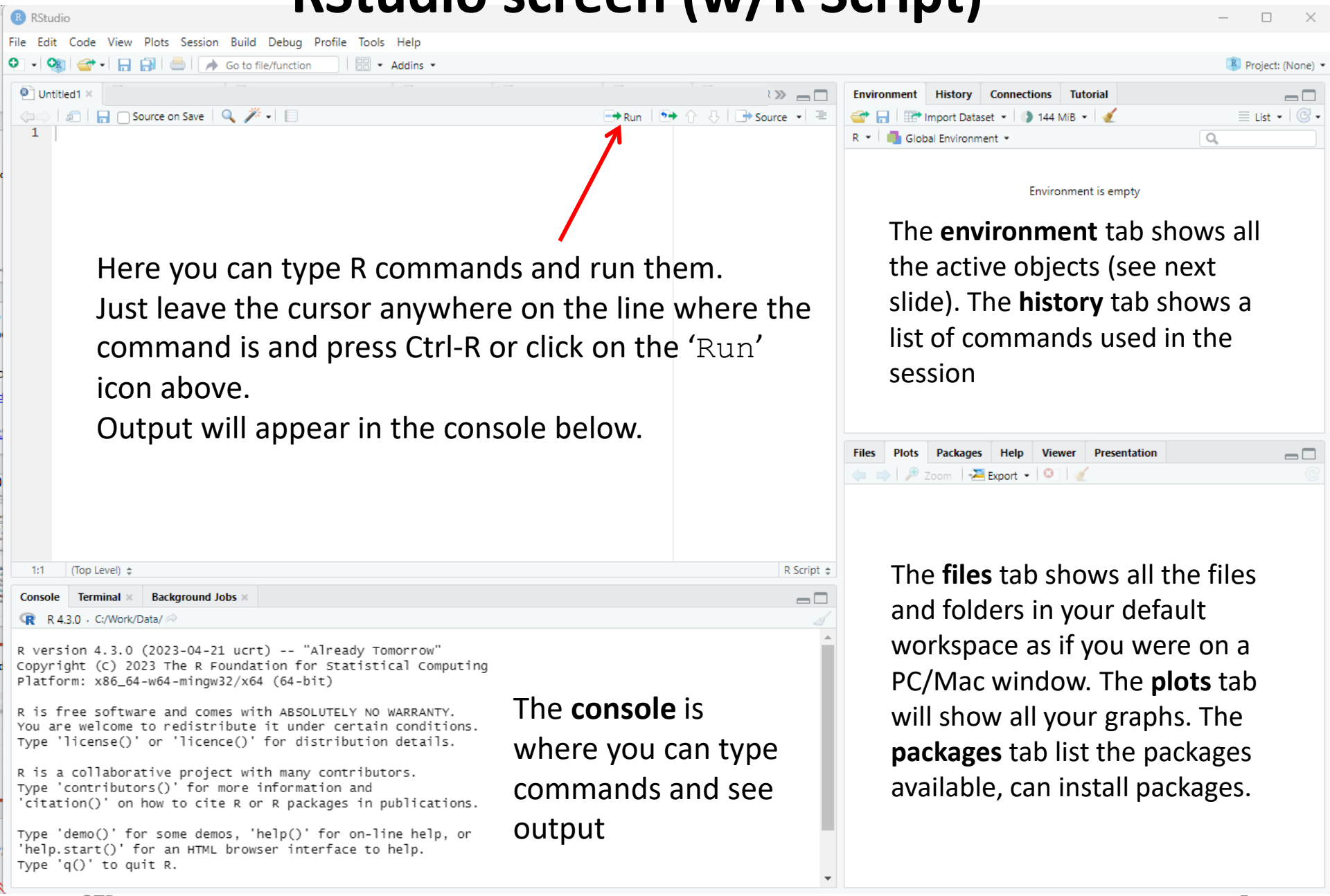
The **files** tab shows all the files and folders in your default workspace as if you were on a PC/Mac window. The **plots** tab will show all your graphs. The **packages** tab list the packages available, can install packages.

Open an R Script window



[See next slide]

RStudio screen (w/R Script)



Here you can type R commands and run them.
Just leave the cursor anywhere on the line where the command is and press Ctrl-R or click on the '`Run`' icon above.
Output will appear in the console below.

The **environment** tab shows all the active objects (see next slide). The **history** tab shows a list of commands used in the session

The **console** is where you can type commands and see output

The **files** tab shows all the files and folders in your default workspace as if you were on a PC/Mac window. The **plots** tab will show all your graphs. The **packages** tab list the packages available, can install packages.

Set working directory

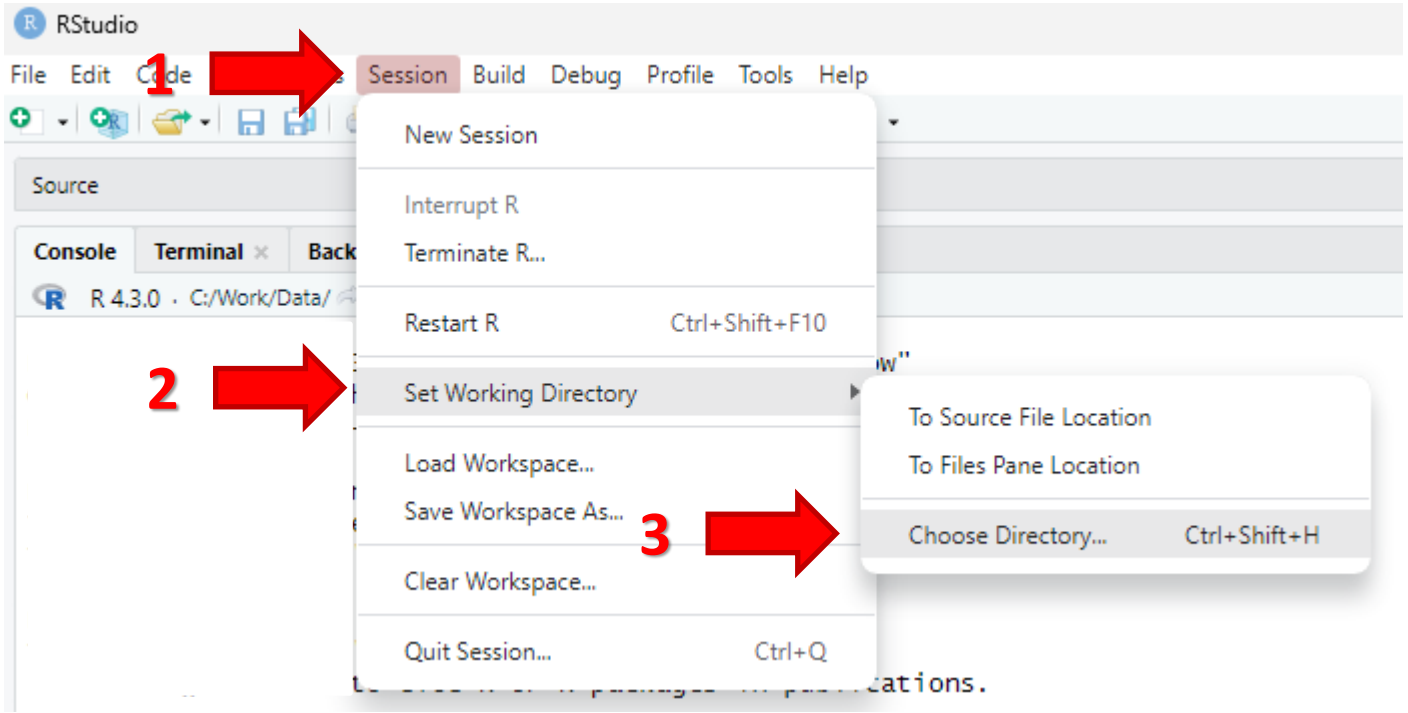
The working directory is the folder where your files are saved and where RStudio will export files. You can check the current working directory by typing the following:

```
getwd()
```

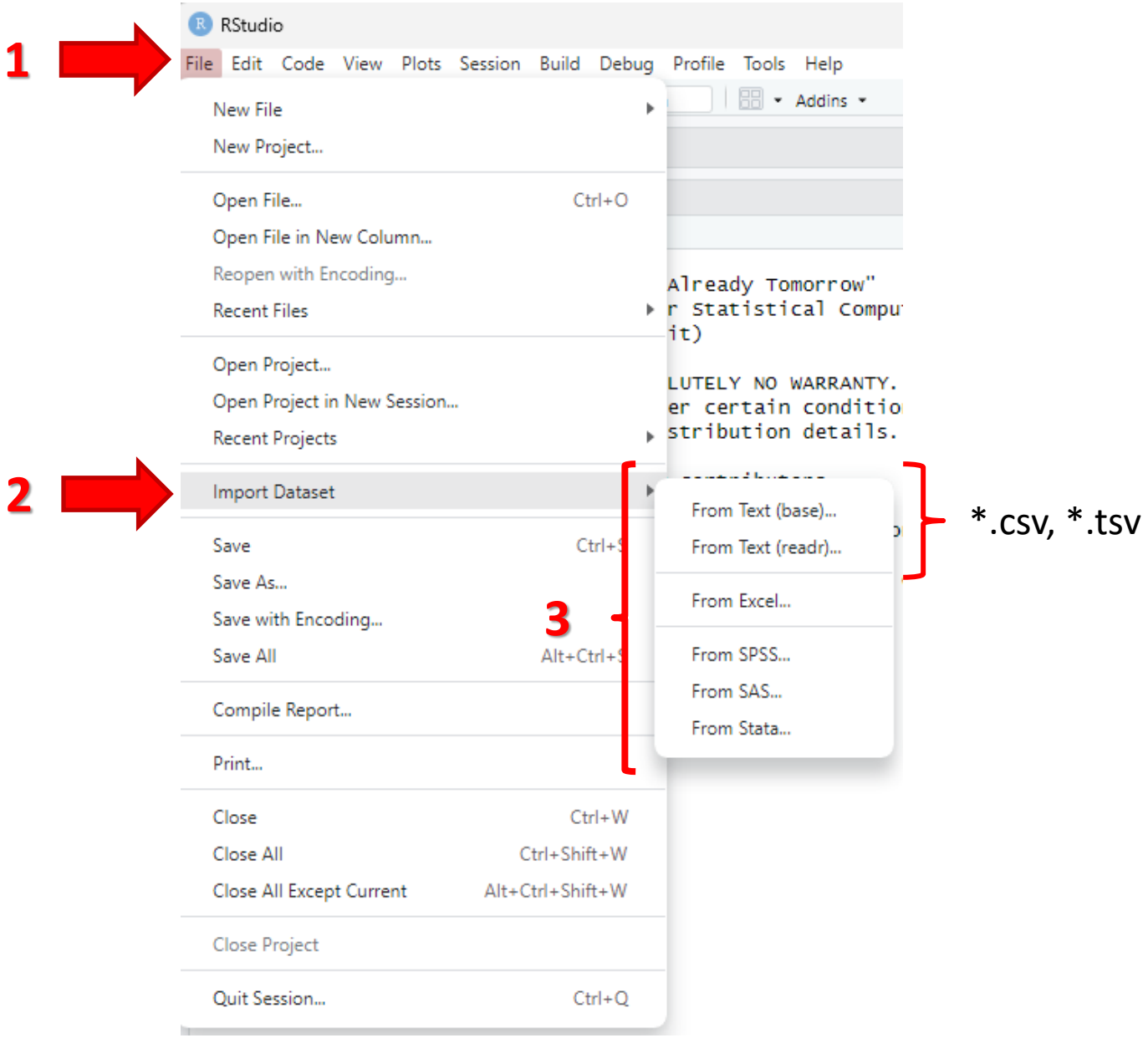
You can change the working directory by typing (if using Windows):

```
setwd("C:/myfolder/data")
```

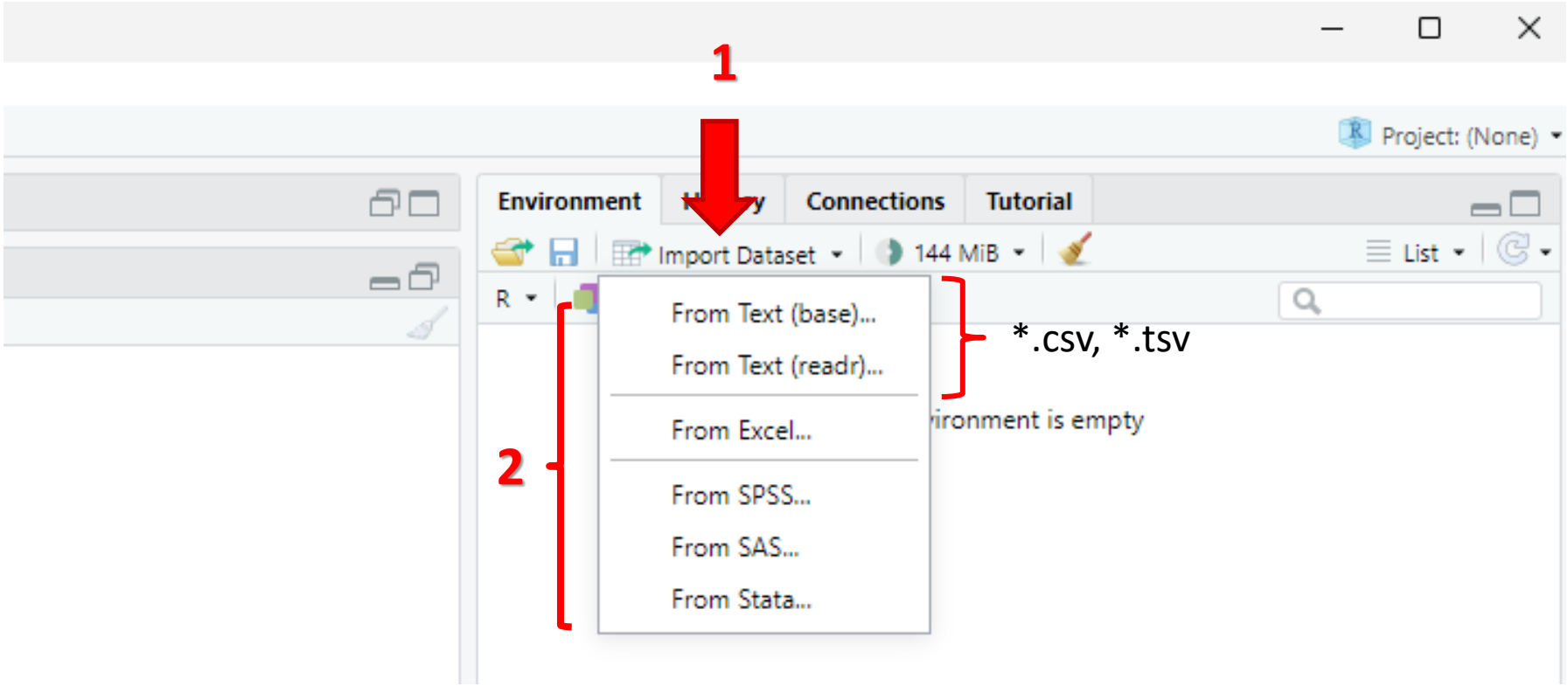
Or you can use the menu:



Import files into RStudio (1)

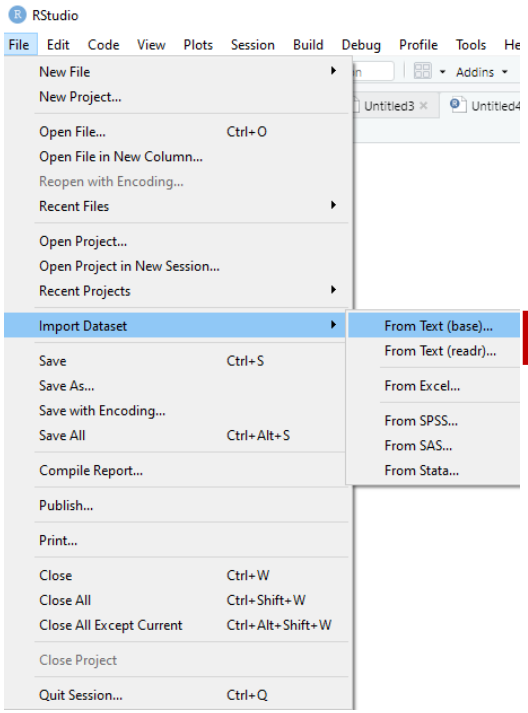


Import files into RStudio (2)



NOTE: When importing files from Excel or ASCII format (*.csv, *.tsv) make sure the data is in the format shown in slides 2 and/or 3 in this document:

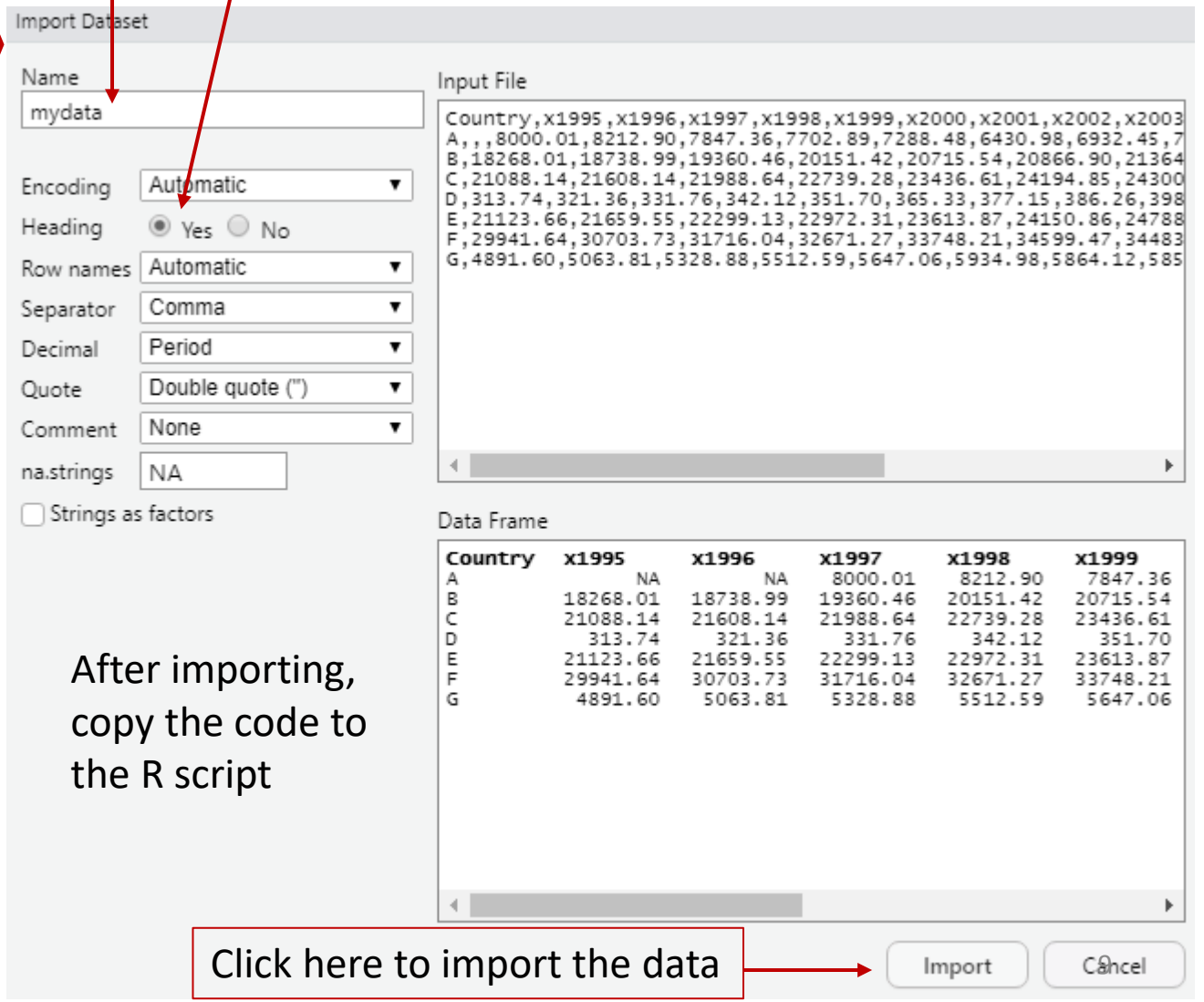
https://www.princeton.edu/~otorres/DataPrep101.pdf



Using import data From Text (base)

After loading the data, change name to something short here

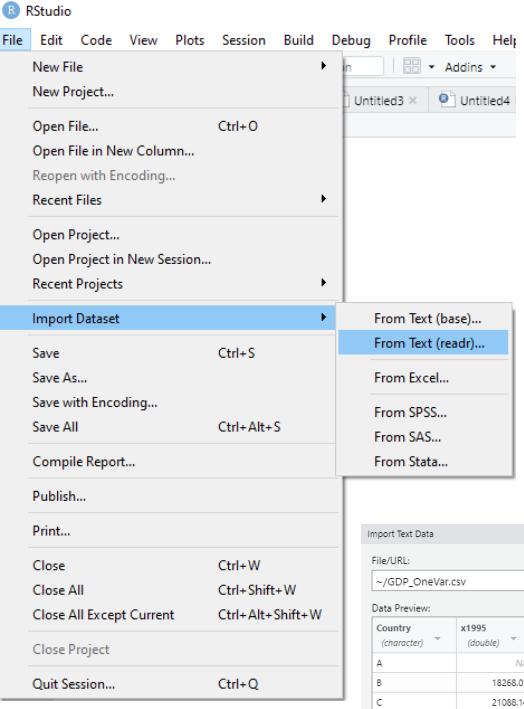
If your data has column titles, check 'Yes' here



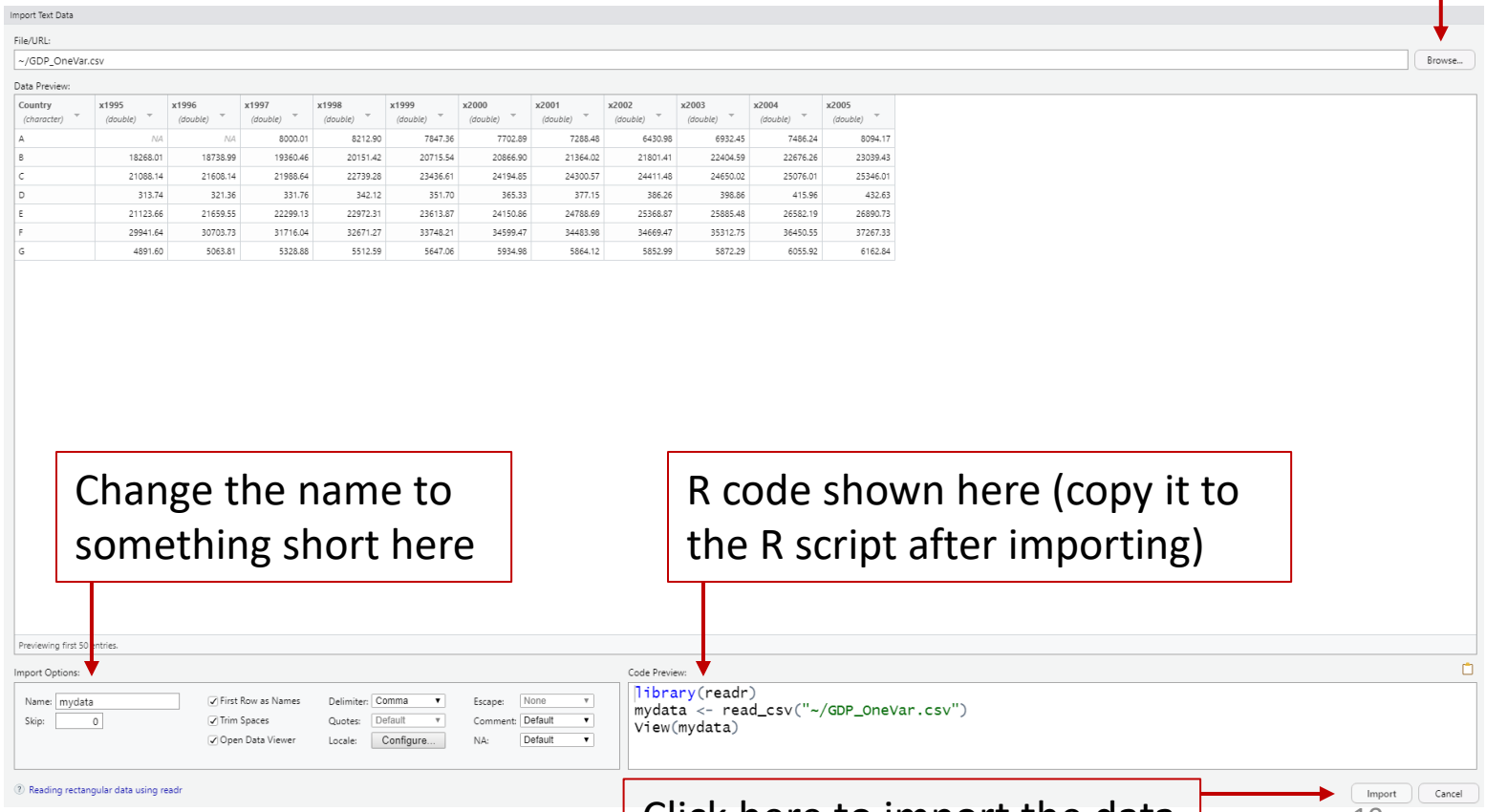
After importing, copy the code to the R script

Click here to import the data

Using import data From Text (readr)



Click here to find the file

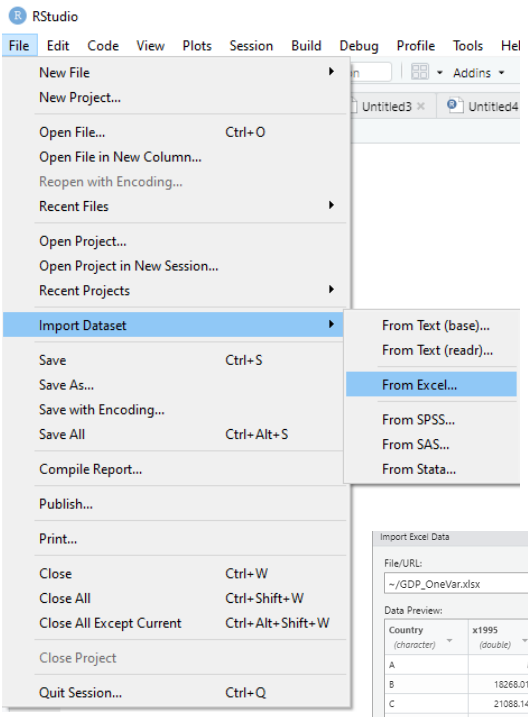


Change the name to something short here

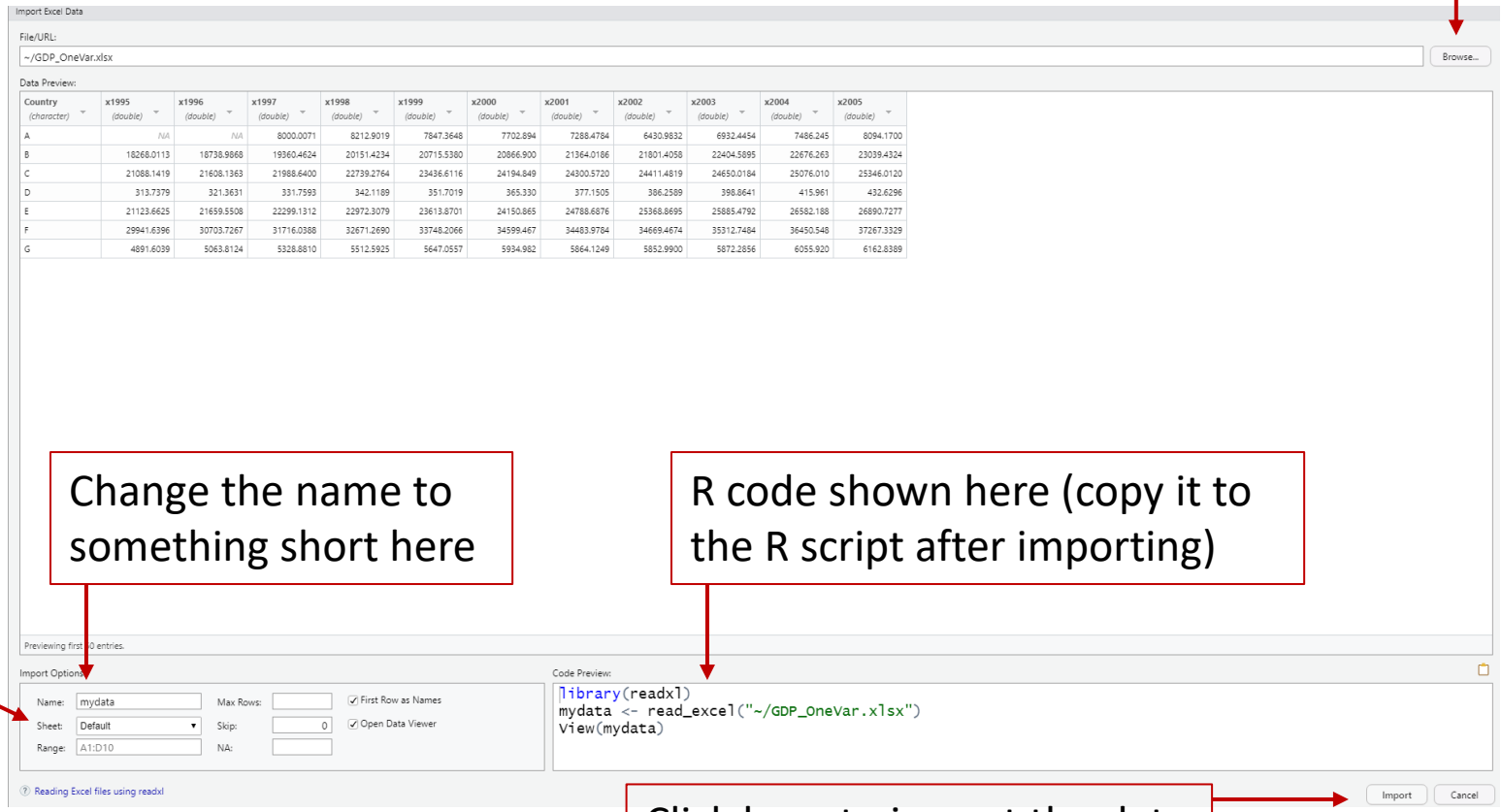
R code shown here (copy it to the R script after importing)

Click here to import the data

Using import data From Excel



Click here to find the file



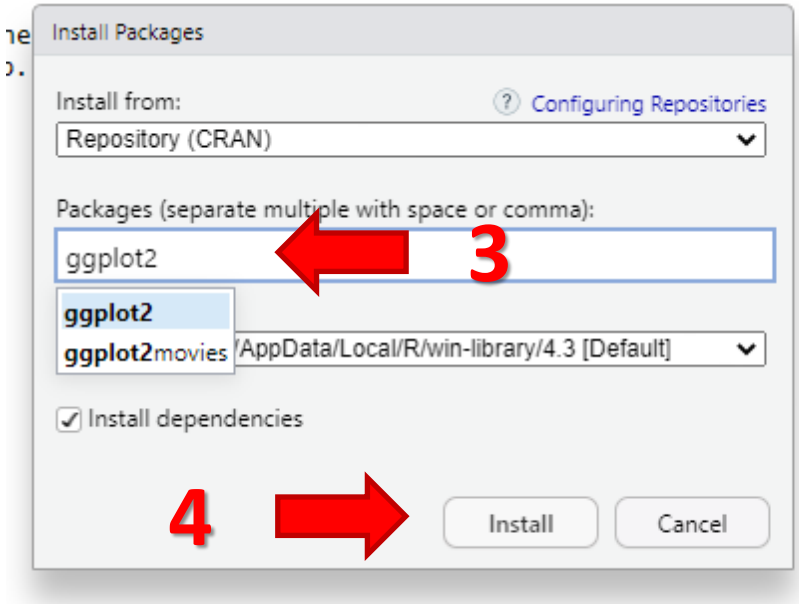
If the file has more than one sheet, select the one you need here…

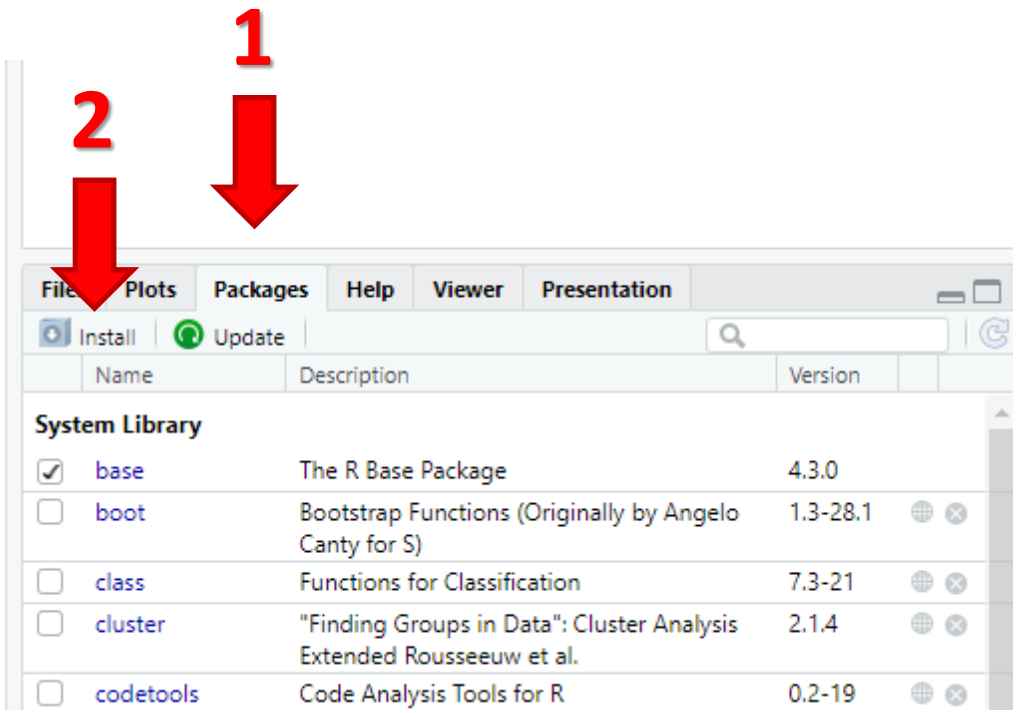
Change the name to something short here

R code shown here (copy it to the R script after importing)

Click here to import the data

Installing a package





Once a package is installed, no need to install it again until a new version of R is installed.
To activate a package type

```
library(name_of_package)
```

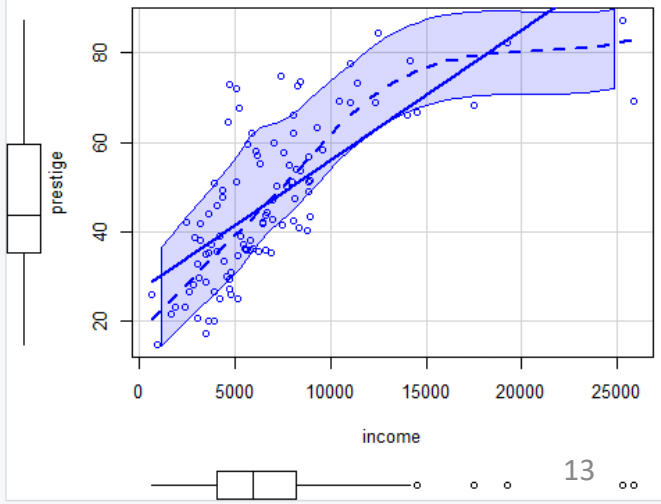
Data visualization

```
1
2  library(car)  # By John Fox and Sanford Weisberg
3  library(rgl)  # By Daniel Adler and Duncan Murdoch
4
5  # Scatterplot
6
7  scatterplot(prestige ~ income, data=Prestige)
8
9  # Scatterplot per group
10
11 scatterplot(prestige ~ income|type, data=Prestige)
12
13 # Scatterplots in matrix form
14
15 scatterplotMatrix(~ prestige + income + education, span=0.7,data=Prestige)
16
17 # 3D graph, scatter3d is from the --car package. It will open in the Viewer window
18
19 scatter3d(prestige ~ income + education, id.n=3, data=Duncan)
20 rglwidget()
```

1 Run

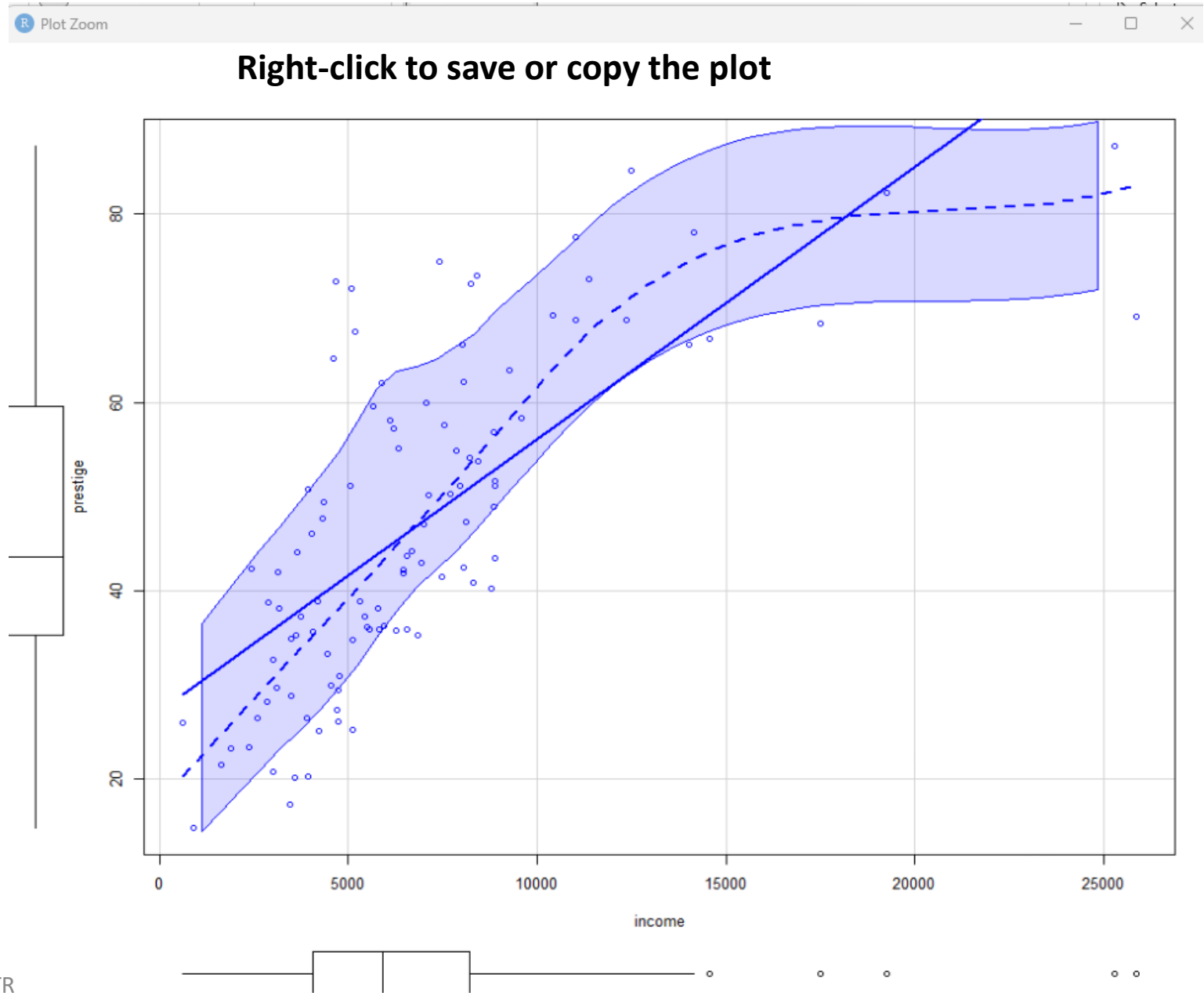
2 click on Zoom

```
> scatterplot(prestige ~ income, data=Prestige)
>
```



[See next slide]

Data visualization



Data visualization

RStudio

File Edit Code View Plots Session Build Debug Profile Tools Help

Go to file/function | Addins | Project: (None)

Untitled1 | Graphs.R*

Source on Save | Run | Source

```
1
2  library(car)  # By John Fox and Sanford Weisberg
3  library(rgl)  # By Daniel Adler and Duncan Murdoch
4
5  # Scatterplot
6
7  scatterplot(prestige ~ income, data=Prestige)
8
9  # Scatterplot per group
10
11 scatterplot(prestige ~ income|type, data=Prestige)
12
13 # Scatterplots in matrix form
14
15 scatterplotMatrix(~ prestige + income + education, span=0.7,data=Prestige)
16
17 # 3D graph, scatter3d is from the --car package. It will open in the Viewer window
18
19 scatter3d(prestige ~ income + education, id.n=3, data=Duncan)
20 rglwidget()
```

1 Run

7:1 (Top Level) R Script

Console | Terminal | Background Jobs

R 4.3.0 · C:/Work/Data/

```
> scatterplot(prestige ~ income, data=Prestige)
>
```

Environment | History | Connections | Tutorial

Import Dataset | 333 MiB | List

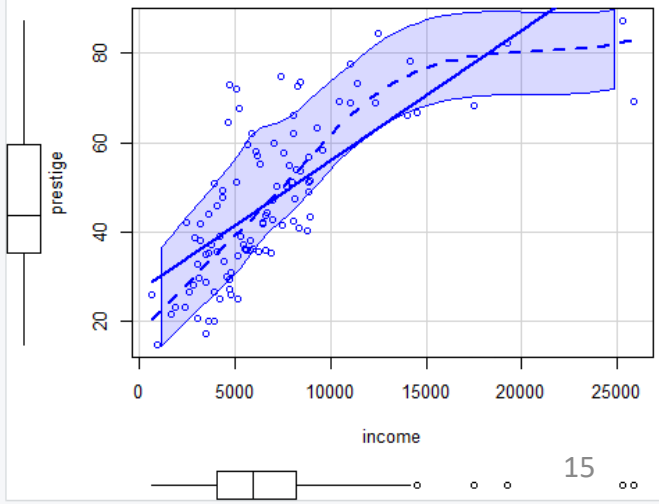
R | Global Environment

Environment is empty

2 click on Export to save or copy the plot.

Files | Plots | Packages | Viewer | Presentation

Zoom | Export



[See next slide]

Data visualization (3D graphics)

RStudio

File Edit Code View Plots Session Build Debug Profile Tools Help

Go to file/function | Addins | Project: (None)

Untitled1 | Graphs.R*

Source on Save | Run | Source

```
1
2  library(car)  # By John Fox and Sanford Weisberg
3  library(rgl)  # By Daniel Adler and Duncan Murdoch
4
5  # Scatterplot
6
7  scatterplot(prestige ~ income, data=Prestige)
8
9  # Scatterplot per group
10
11 scatterplot(prestige ~ income|type, data=Prestige)
12
13 # Scatterplots in matrix form
14
15 scatterplotMatrix(~ prestige + income + education, span=0.7,data=Prestige)
16
17 # 3D graph, scatter3d is from the --car package. It will open in the Viewer window
18
19 scatter3d(prestige ~ income + education, id.n=3, data=Duncan)
20 rglwidget()
```

1 Run

20:12 (Top Level) R Script

Console | Terminal | Background Jobs

R 4.3.0 · C:/Work/Data/

```
> scatterplot(prestige ~ income, data=Prestige)
> scatter3d(prestige ~ income + education, id.n=3, data=Duncan)
> rglwidget()
>
```

Environment | History | Connections | Tutorial

Import Dataset | 359 MiB | List

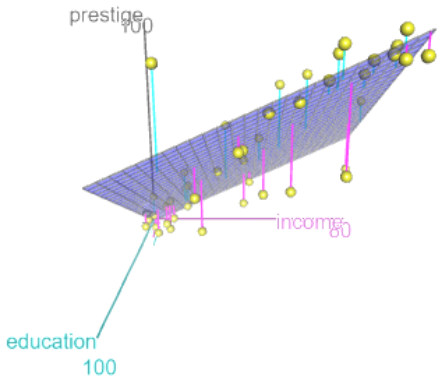
R | Global Environment

Environment is empty

2 click on Zoom

Files | Plots | Packages | Help | Viewer | Presentation

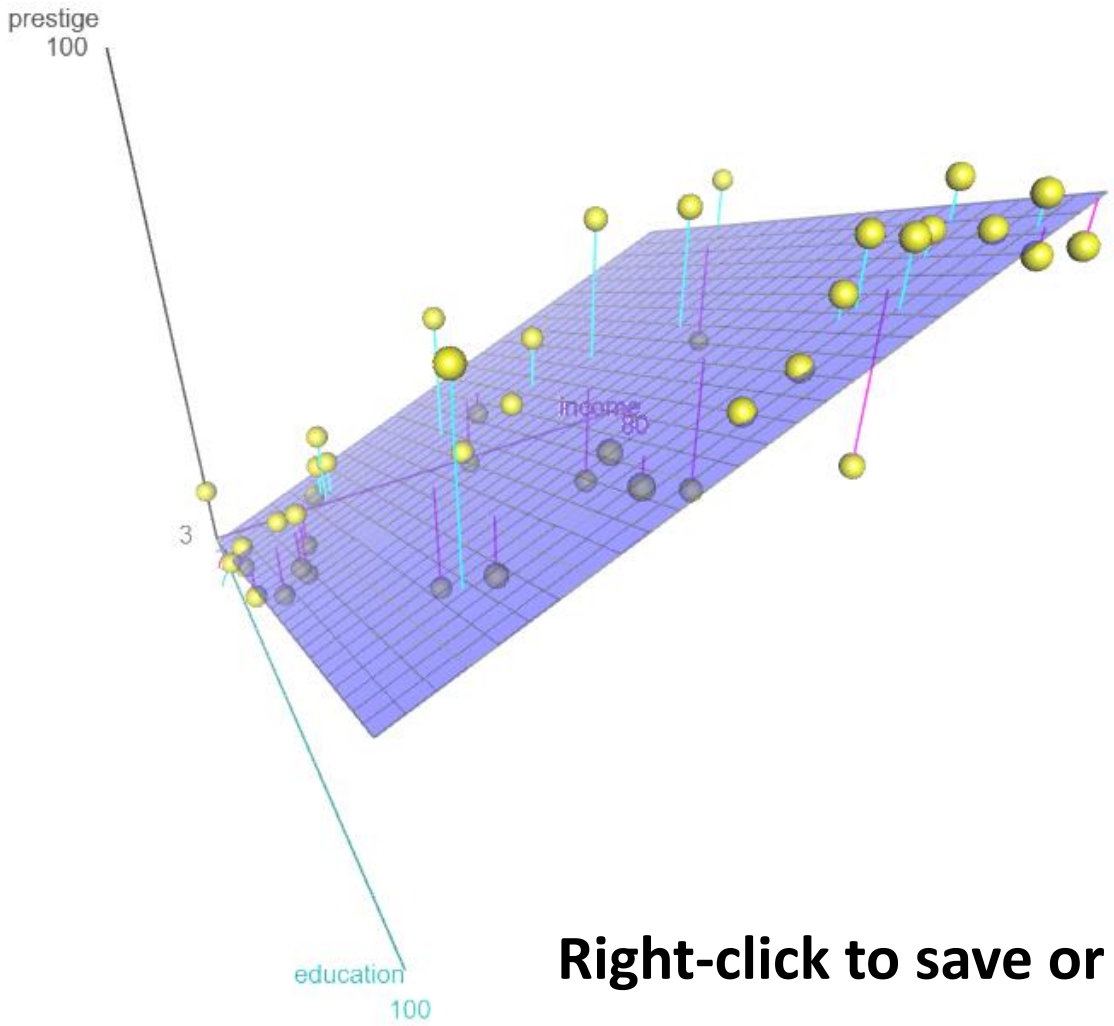
Zoom | Export



[See next slide]

Data visualization (3D graphics)

Use the cursor to move the graph around



Right-click to save or copy the plot