

Computer lab: R & RStudio

- In this course we will perform structural network analysis with packages implemented in the R statistical software
- R is the software – but we will use Rstudio as an interface
- R is an open-source project lifted by a virtual community of thousands of developers and million of users worldwide

Why R?

- Reproducibility – R scripts
- Today R offers the most elegant and comprehensive language for the structural and dynamic analysis of networks
- It's free and contains state-of-the-art statistical and graphical routines not yet available in other software
- You can do all your analysis in R, but also data scrapping, create a webpage, or write your research paper

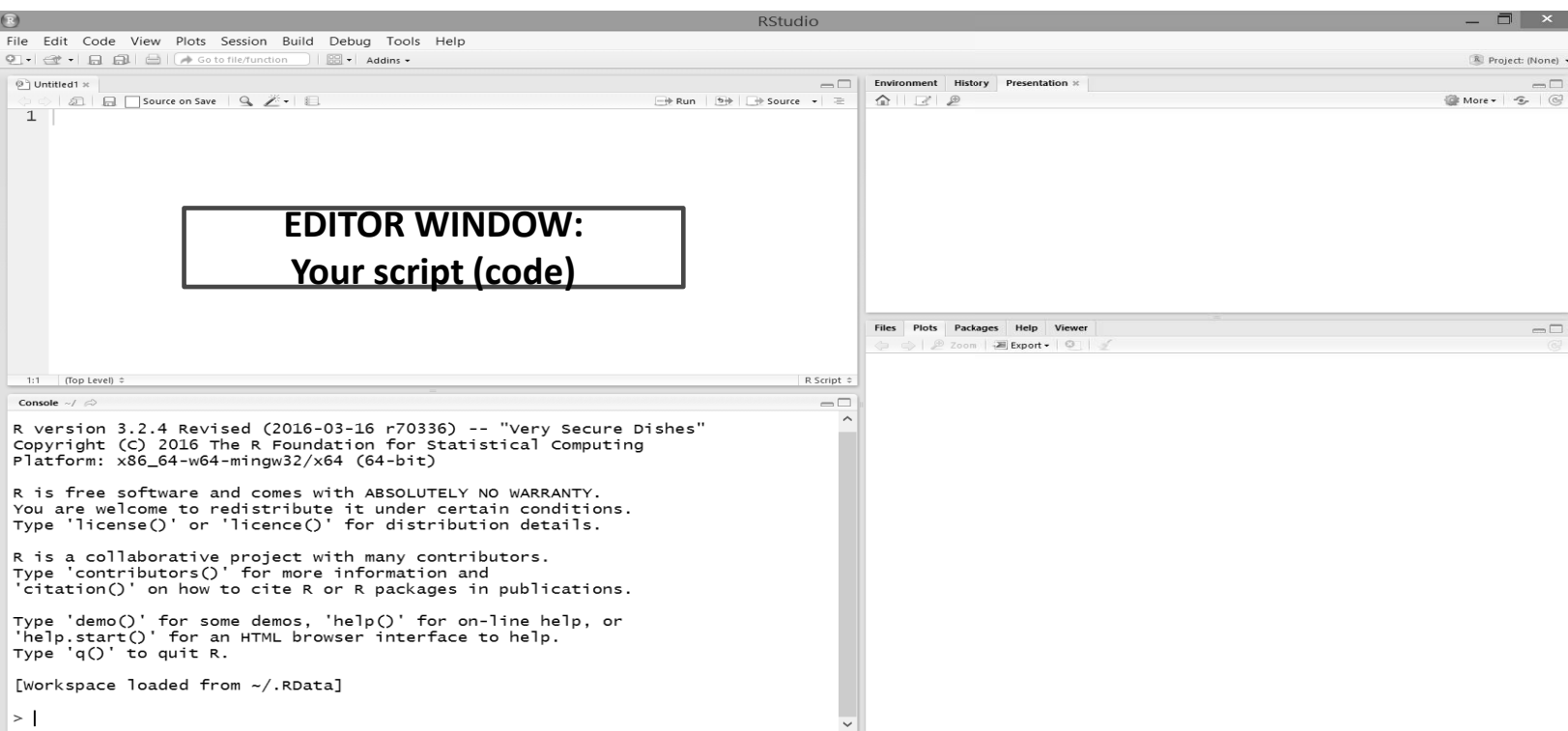
Getting started with R

- Using R is easier than it looks like. And once you master it, you save a ridiculous amount of time
- Afraid of R? It is just a big calculator (a very smart one)
- R is case sensitive
- The `#` character at the beginning of a line signifies a comment, it is ignored by R

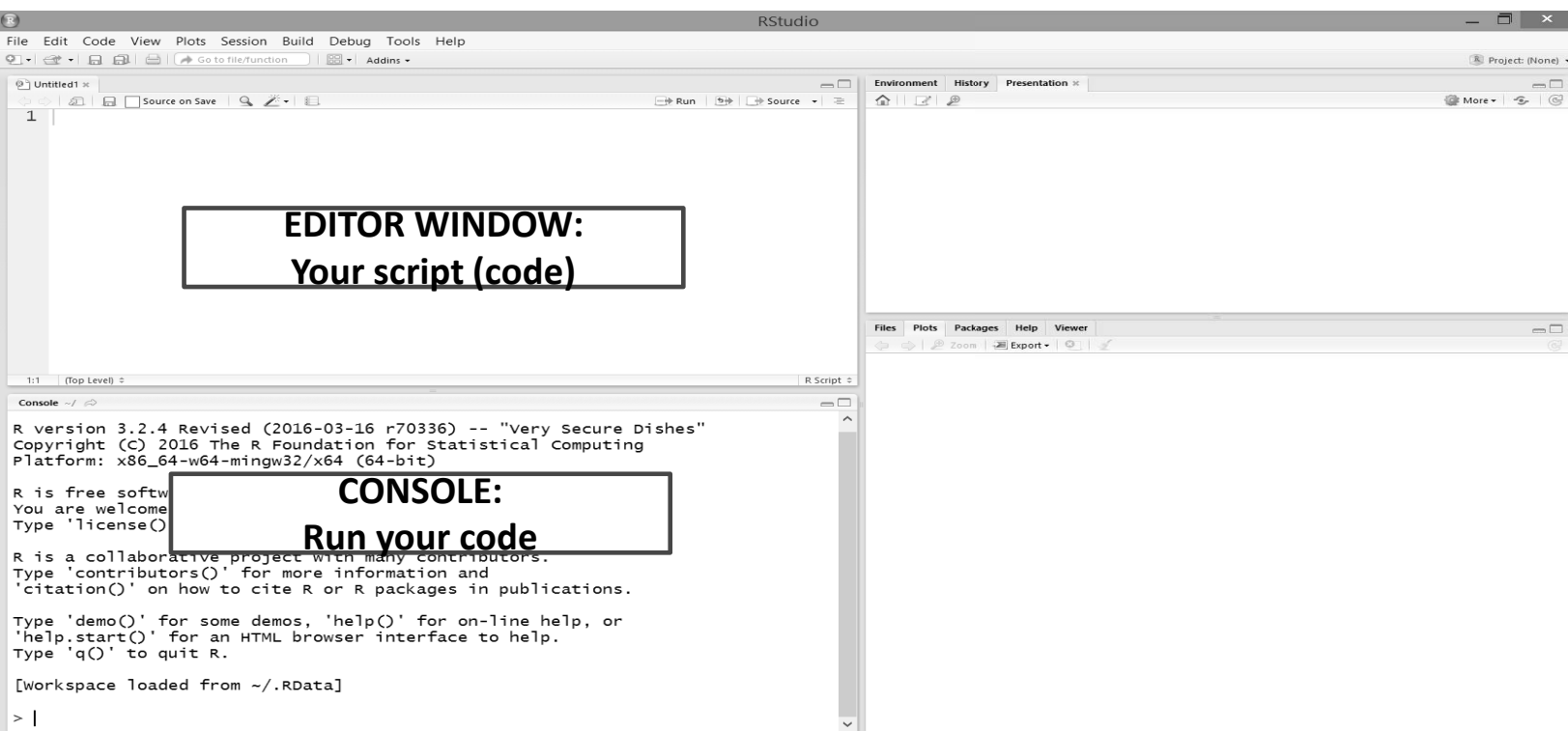


The `<-` operator assigns and stores objects (data, output of

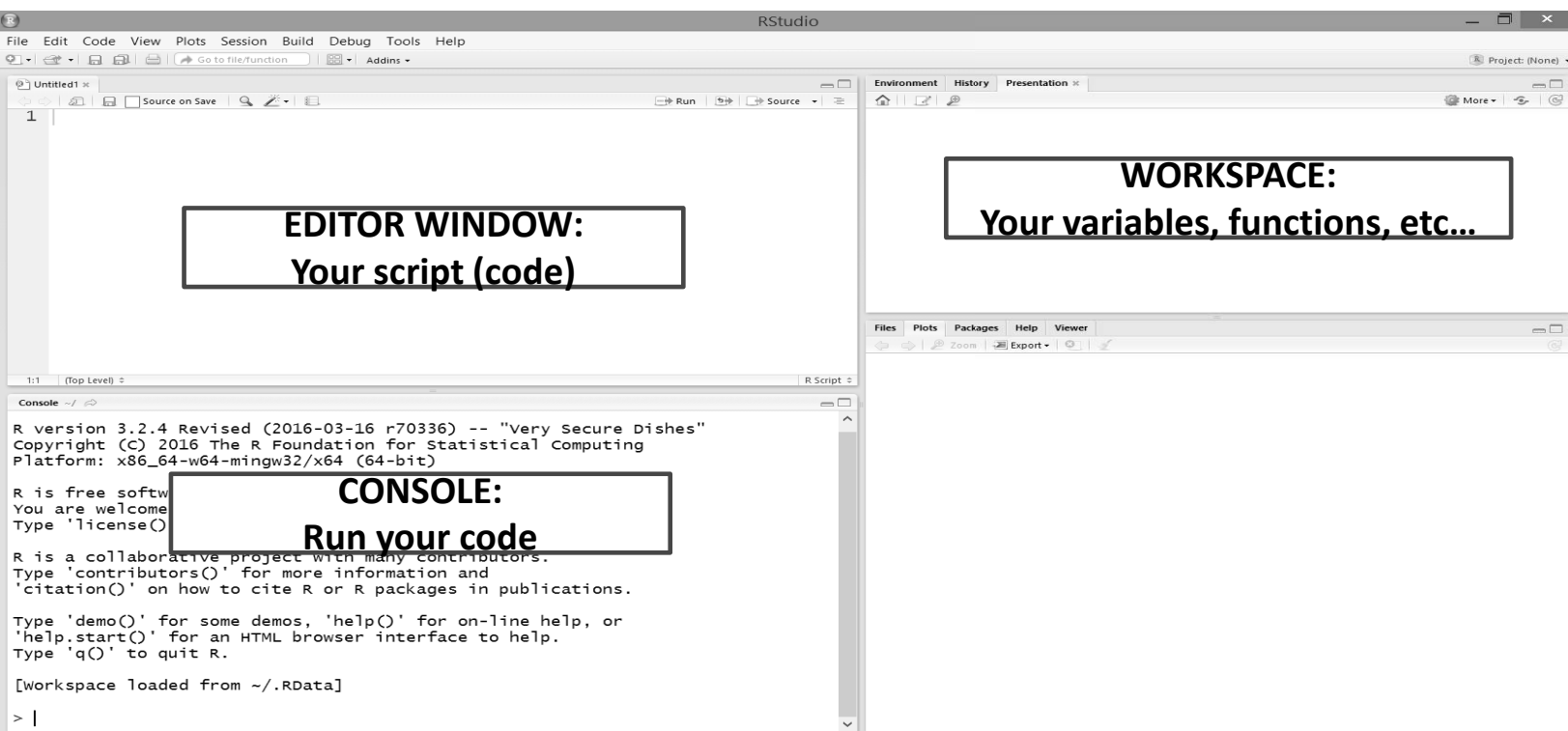
RStudio



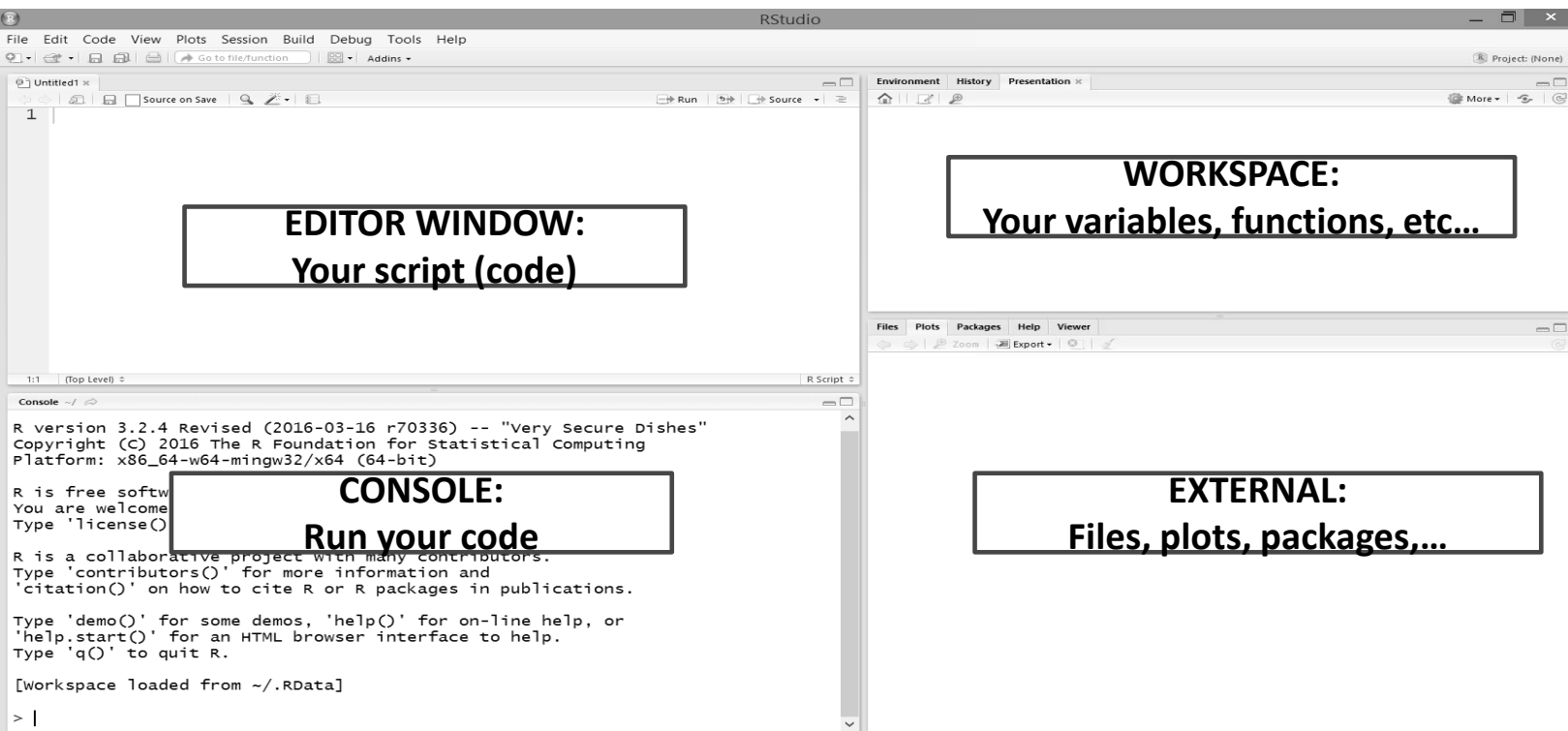
RStudio



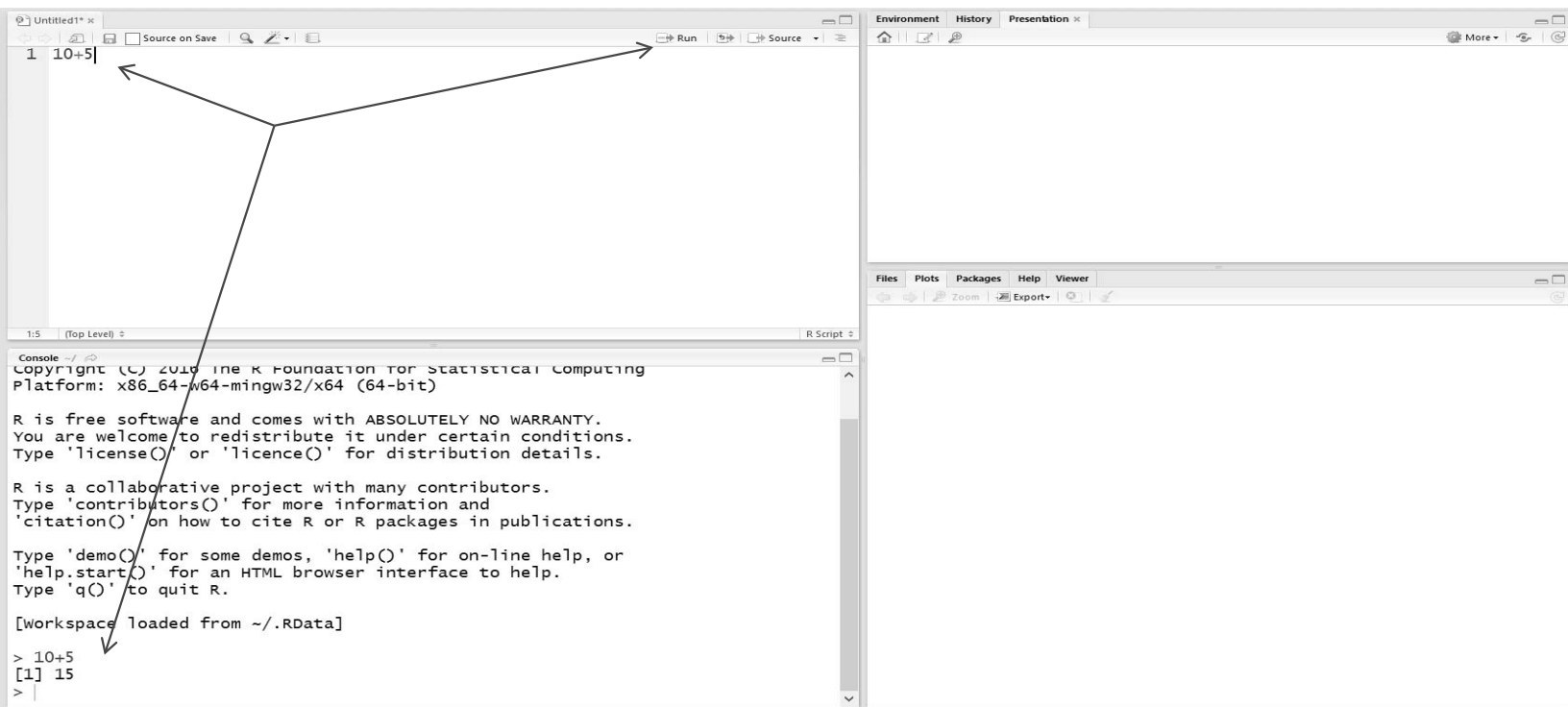
RStudio



RStudio



Let's get started



Create a variable "x"

The screenshot displays the RStudio interface with the following components:

- Source Editor:** Contains two lines of R code:

```
1 10+5  
2 x <- 10+5|
```
- Environment Pane:** Shows the 'Global Environment' with a table of values:

values	
x	15
- Console:** Shows the R startup sequence and the execution of the code:

```
R platform: x86_64-w64-mingw32/x86_64 (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.  
  
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]  
  
> 10+5  
[1] 15  
> x <- 10+5  
> |
```

A double-headed arrow connects the code `x <- 10+5` in the Source Editor to the variable `x` in the Environment Pane, illustrating the relationship between the code and the created variable.

Create a variable y

The screenshot shows the RStudio interface with the following components:

- Source Editor:** Contains three lines of R code:

```
1 10+5
2 x <- 10+5
3 y <- "geography"
```
- Environment Pane:** Displays the current environment with the following values:

Variable	Value
x	15
y	"geography"
- Console:** Shows the output of the R session, including the R welcome message and the results of the code execution:

```
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.

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]

> 10+5
[1] 15
> x <- 10+5
> y <- "geography"
>
```

Check the value of x and y

The screenshot displays the RStudio environment with the following components:

- Source Editor:** Contains an R script with the following code:

```
1 10+5
2 x <- 10+5
3 y <- "geography"
4 # check the value of x and y
5 x
6 y
7 |
```
- Environment Pane:** Shows the current environment with the following values:

Variable	Value
x	15
y	"geography"
- Console:** Displays the output of the script execution:

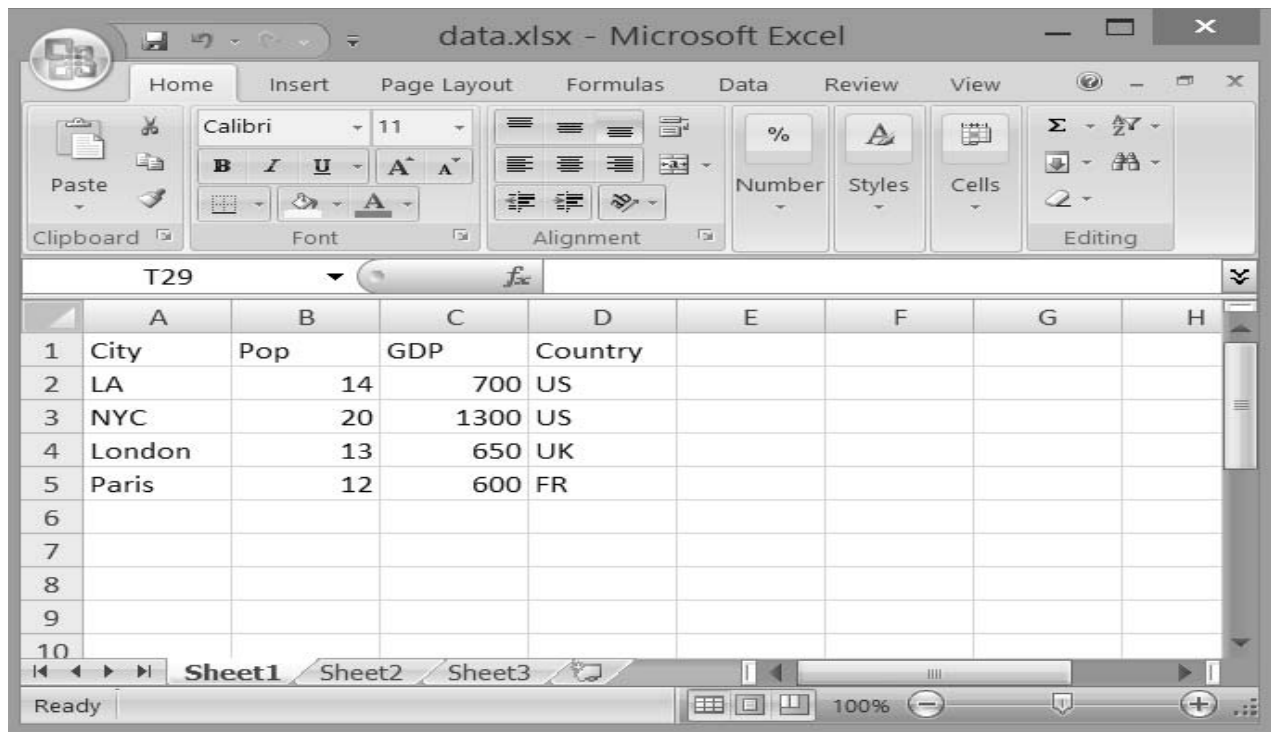
```
R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.

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]

> 10+5
[1] 15
> x <- 10+5
> y <- "geography"
> # check the value of x and y
> x
[1] 15
> y
[1] "geography"
> |
```

Let's create a toy dataset

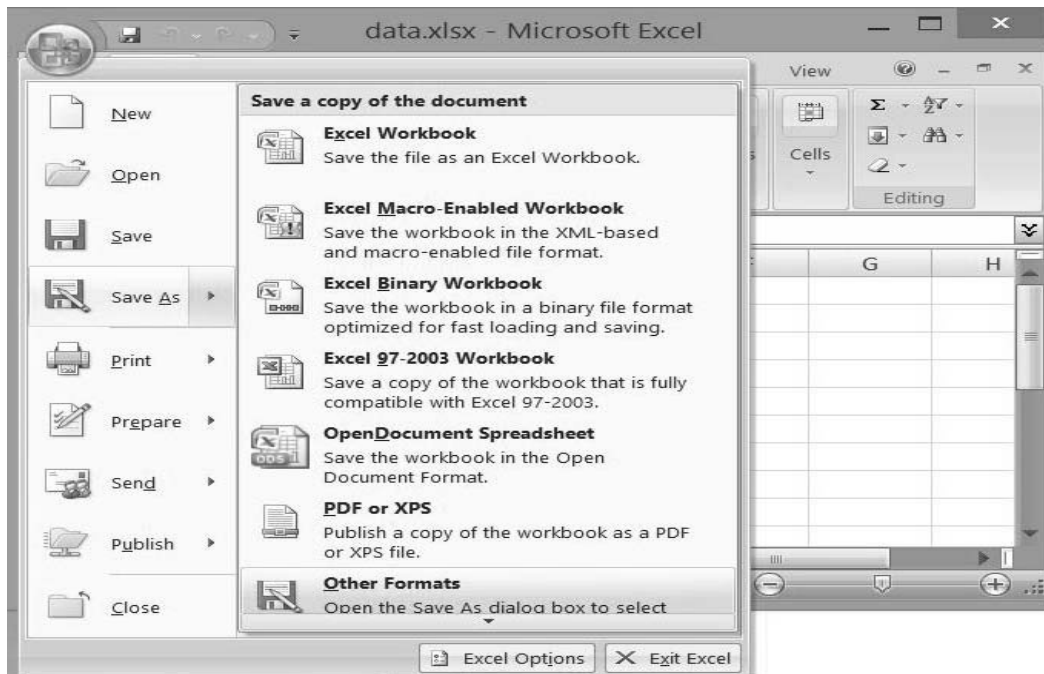


The screenshot shows a Microsoft Excel window titled "data.xlsx - Microsoft Excel". The ribbon is set to "Home", and the "Font" group is active. The spreadsheet contains a table with 5 rows of data. The columns are labeled A through H, with the first four columns (A-D) containing the data. The data is as follows:

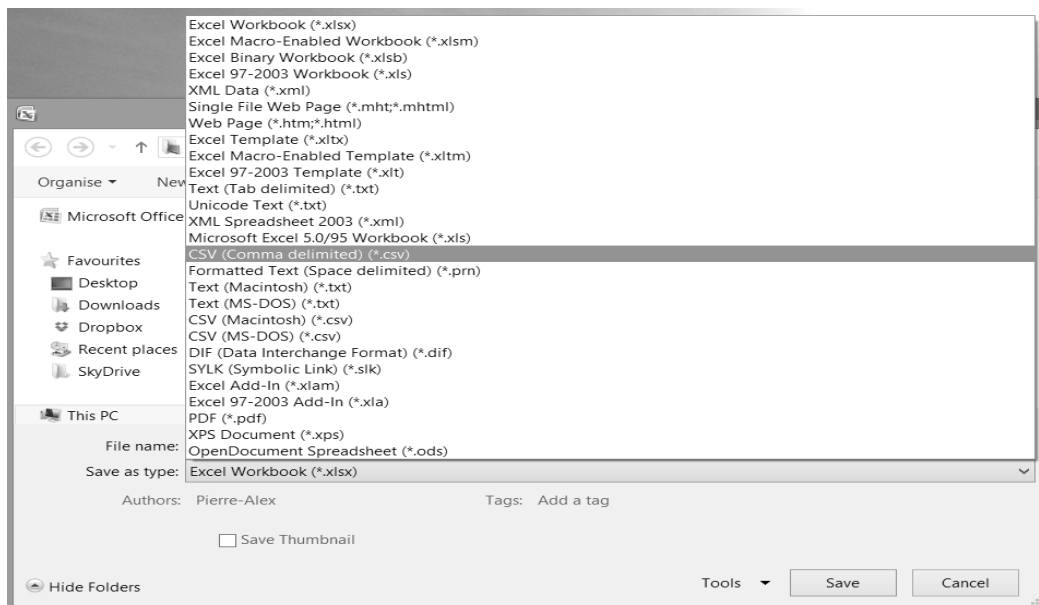
	A	B	C	D	E	F	G	H
1	City	Pop	GDP	Country				
2	LA	14	700	US				
3	NYC	20	1300	US				
4	London	13	650	UK				
5	Paris	12	600	FR				
6								
7								
8								
9								
10								

The status bar at the bottom shows "Ready" and "100%".

Save as a .csv file



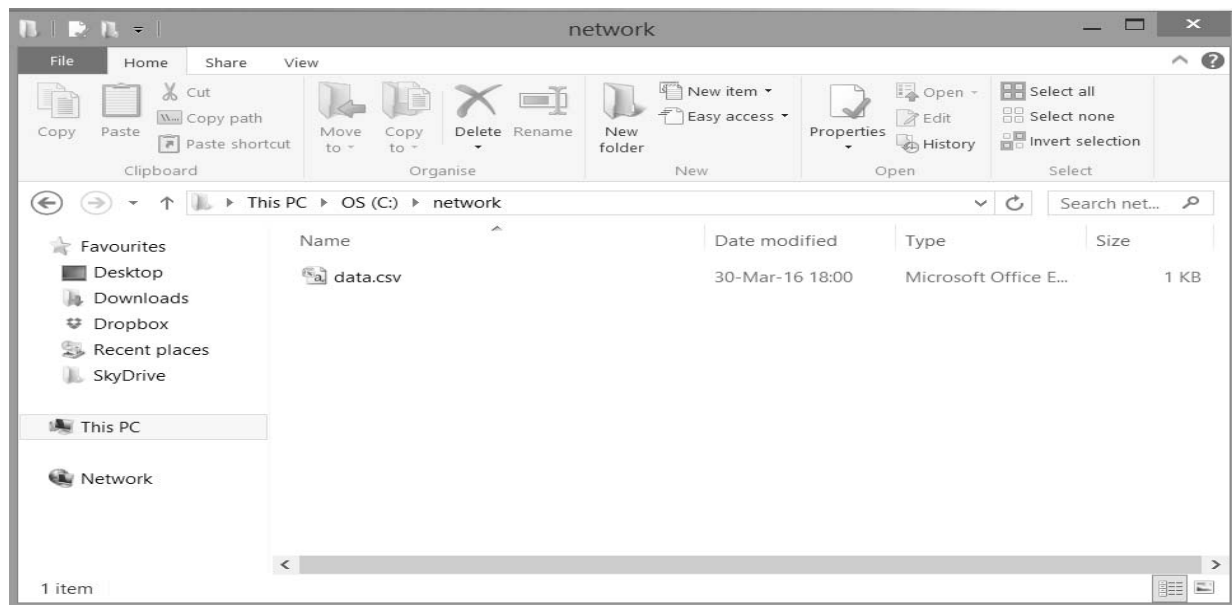
Save as a .csv file



Two warnings: ok



Create a new folder and move the .csv



This is your file path

