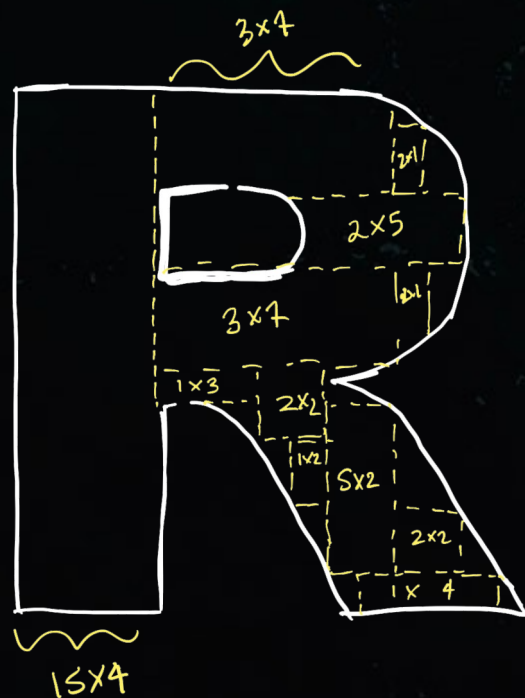


Introduction to R

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内容 *Content*

- **第一天** *First day*
- 什么是 R ? *¿what is R?*
- 什么是 Rstudio ? *¿what is Rstudio?*
- 它们是什么样子的 ? *¿how they look?*
- 它们是如何工作的 ? *¿how they work?*
- 整洁数据 (*Tidy Data*) : 在开始之前, 我应该如何组织我的数据集 ?
¿how should I organize my dataset before starting?

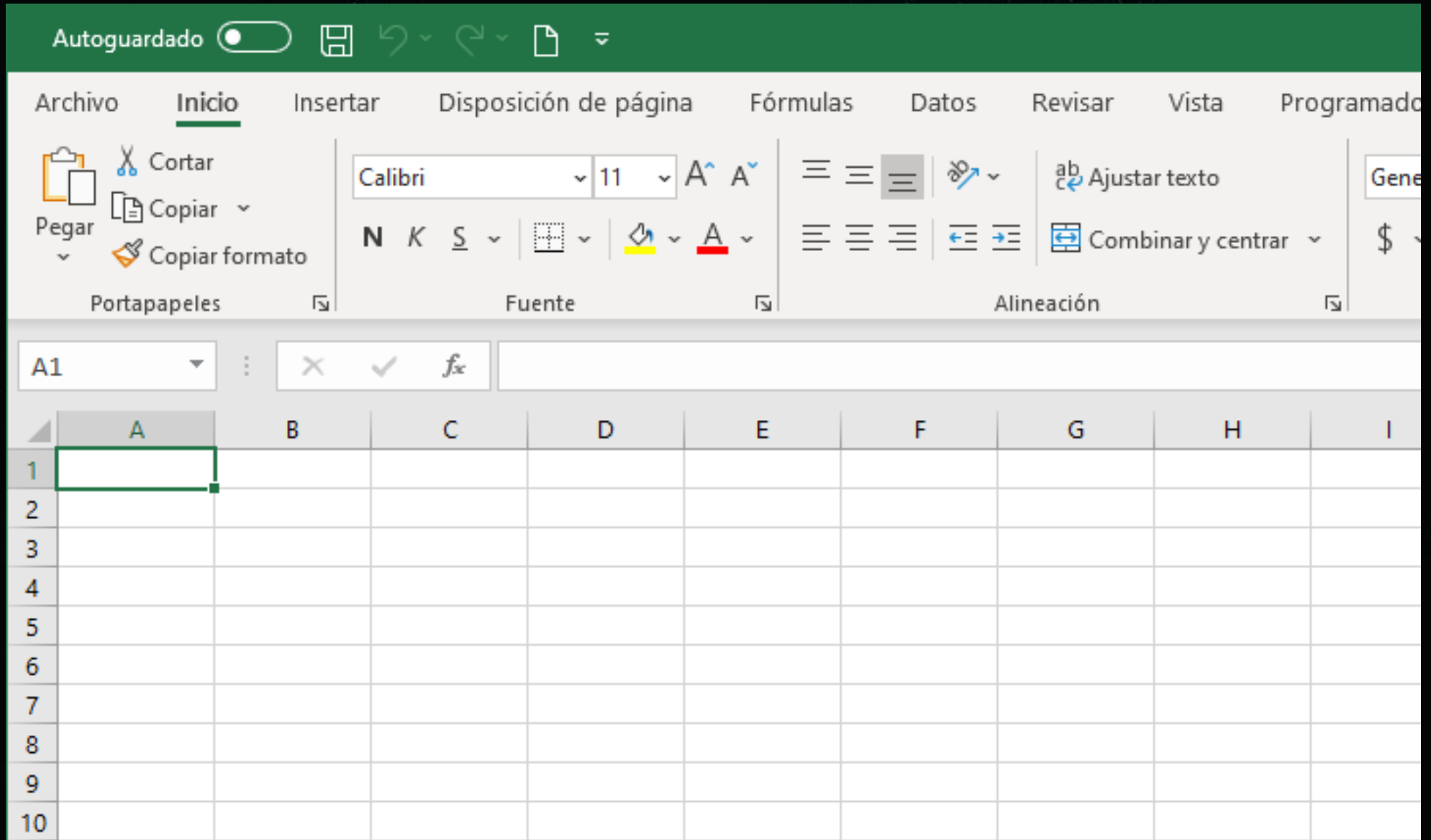
- **第二天** *Second day*
- 使用 *Praxelis* 数据进行实践 *Practice with Praxelis data*
- 加载数据集 *Load dataset*
- 相关性分析 *Correlation Analysis*
- 方差分析 *Analysis of Variance*

内容 *Activities*

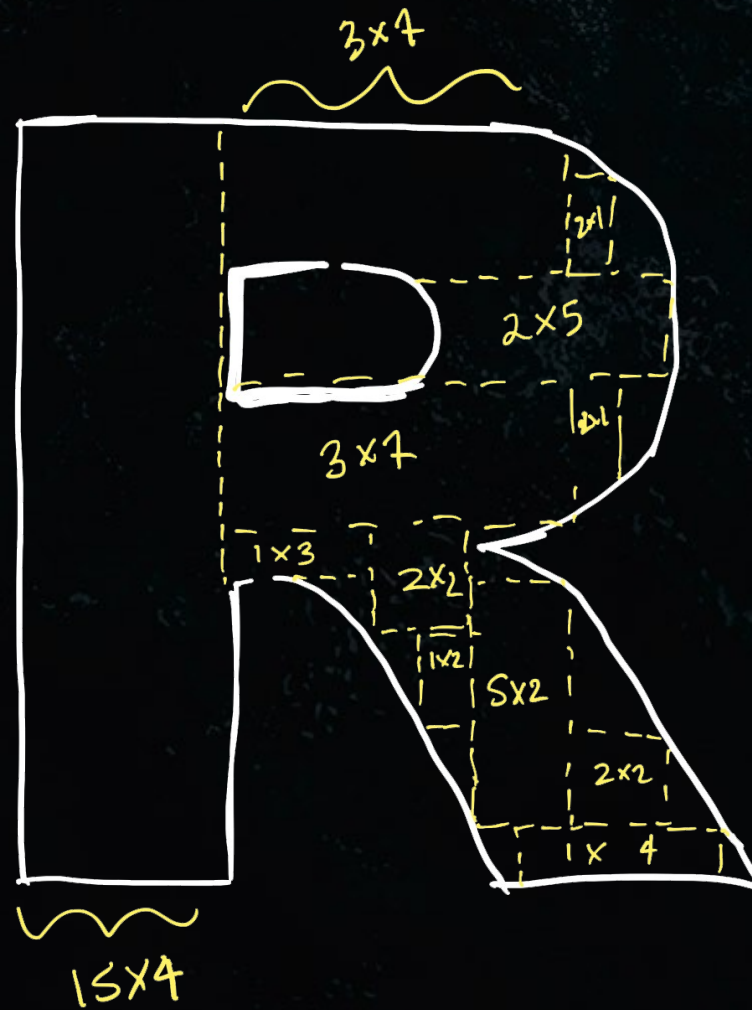
- www.pepiamodeo.com/cursor/activity/activity_1.R
- www.pepiamodeo.com/cursor/activity/activity_2.R
- www.pepiamodeo.com/cursor/activity/activity_3.R
- www.pepiamodeo.com/cursor/activity/activity_4.R

Wysiwyg

What You See is What You Get



¿R?



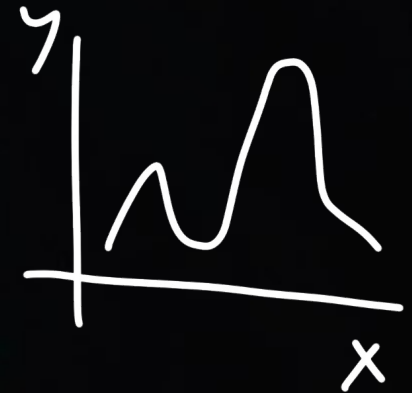
Workflow

$f()$

.R



v1	v2	v3	v4
:	:	:	:
:	:	:	:
:	:	:	:
:	:	:	:
:	:	:	:
:	:	:	:
:	:	:	:
:	:	:	:
:	:	:	:



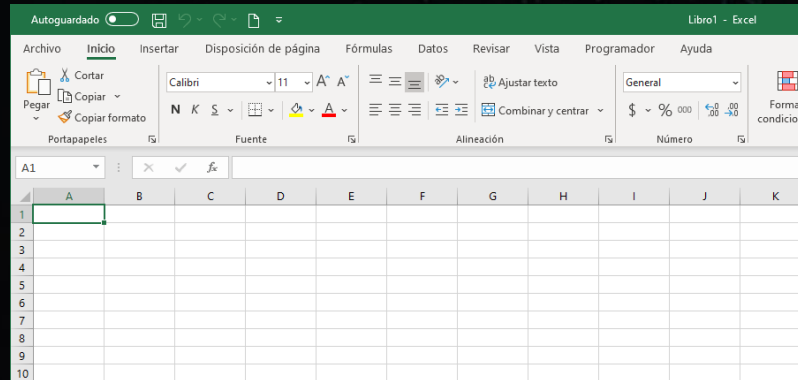
txt, csv, xlsx... geotiff...

csv, jpg, png, pdf, tiff

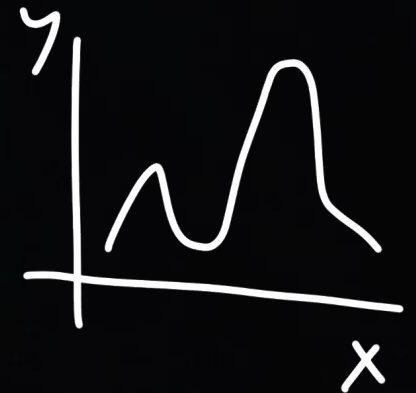
Work flow is not smooth with wysiwyg



$f()$



v1	v2	v3	v4
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
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Reproducible Science



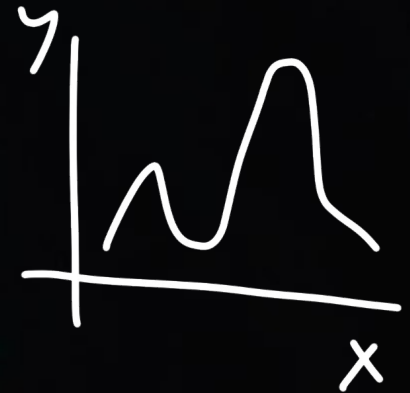
Workflow

$f()$

.R



v1	v2	v3	v4
:	:	:	:
:	:	:	:
:	:	:	:
:	:	:	:
:	:	:	:



txt, csv, xlsx... geotiff...

csv, jpg, png, pdf, tiff

¿Rstudio?



Interface

- Another software we use to interact with R

Rstudio

Interface

The screenshot displays the RStudio application window. The top menu bar includes File, Edit, Code, View, Plots, Session, Project, Build, Tools, and Help. The toolbar contains icons for running code, saving, and other functions. The main editor window shows a script with the following R code:

```
1  
2 rm(list = ls())  
3 N <- 1000  
4 u <- rnorm(N)  
5 x1 <- -2 + rnorm(N)  
6 x2 <- 1 + x1 + rnorm(N)  
7 y <- 1 + x1 + x2 + u  
8 r1 <- lm(y ~ x1 + x2)  
9  
10 |
```

The console at the bottom shows the execution of the same code, with prompts for the user to press Enter to see plots. The right-hand pane is split into two sections: 'Values' and 'Help'. The 'Values' section displays the following data:

Variable	Value
N	1000
r1	lm[12]
u	numeric[1000]
x1	numeric[1000]
x2	numeric[1000]
y	numeric[1000]

The 'Help' section shows the documentation for the `lm` function, titled 'Fitting Linear Models'. It includes a description of the function's purpose and usage, and a list of arguments.

Description

`lm` is used to fit linear models. It can be used to carry out regression, single stratum analysis of variance and analysis of covariance (although `ao` may provide a more convenient interface for these).

Usage

```
lm(formula, data, subset, weights,  
   method = "qr", model = TRUE, x =  
   singular.ok = TRUE, contrasts =
```

Arguments

Rstudio

4 windows

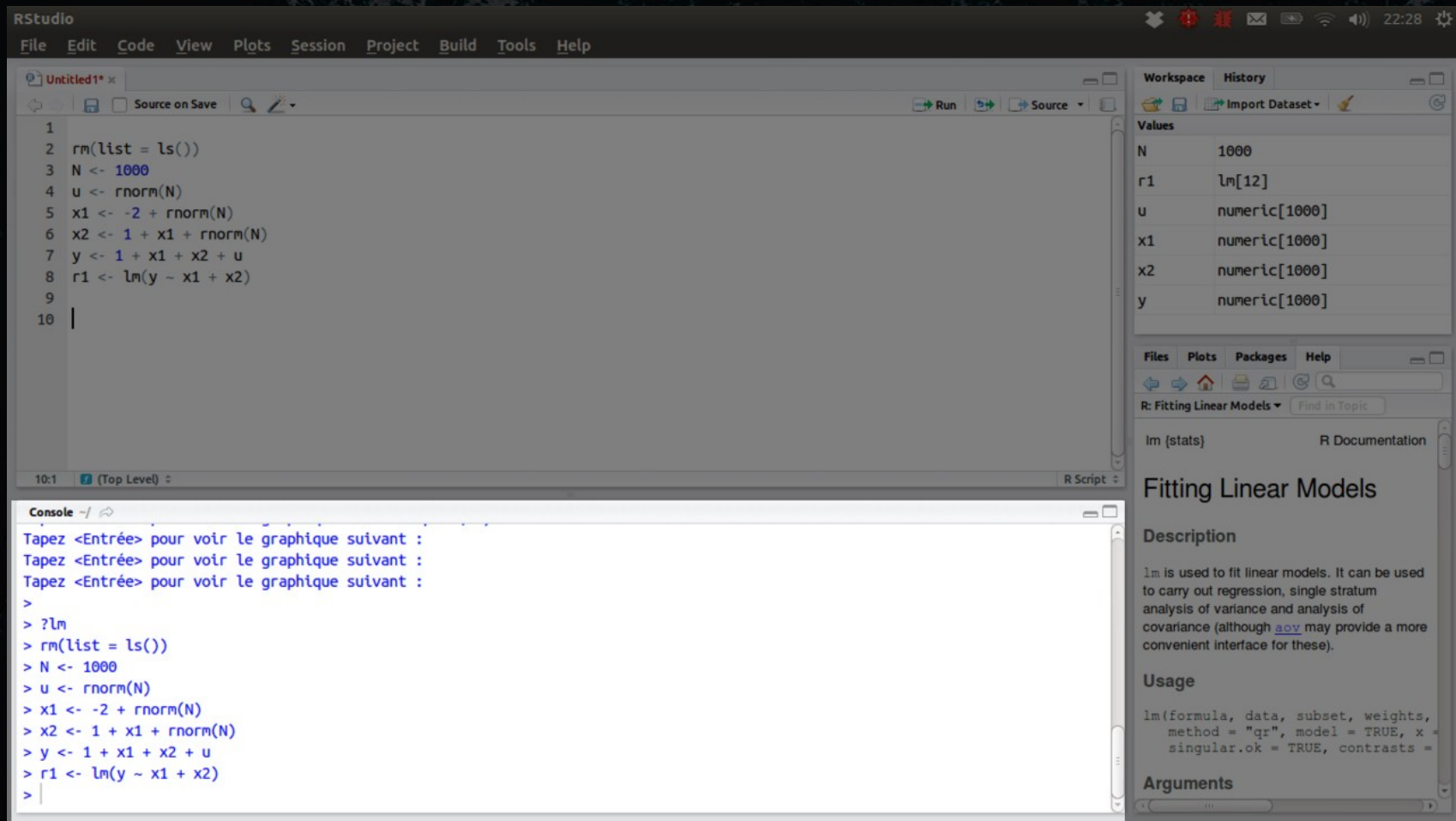
The image shows the RStudio interface with four main windows highlighted by orange borders:

- Script Editor:** The top-left window showing an R script. The code is as follows:

```
1  
2 rm(list = ls())  
3 N <- 1000  
4 u <- rnorm(N)  
5 x1 <- -2 + rnorm(N)  
6 x2 <- 1 + x1 + rnorm(N)  
7 y <- 1 + x1 + x2 + u  
8 r1 <- lm(y ~ x1 + x2)  
9  
10 |
```
- Workspace:** The top-right window showing the current workspace. It contains the following objects:

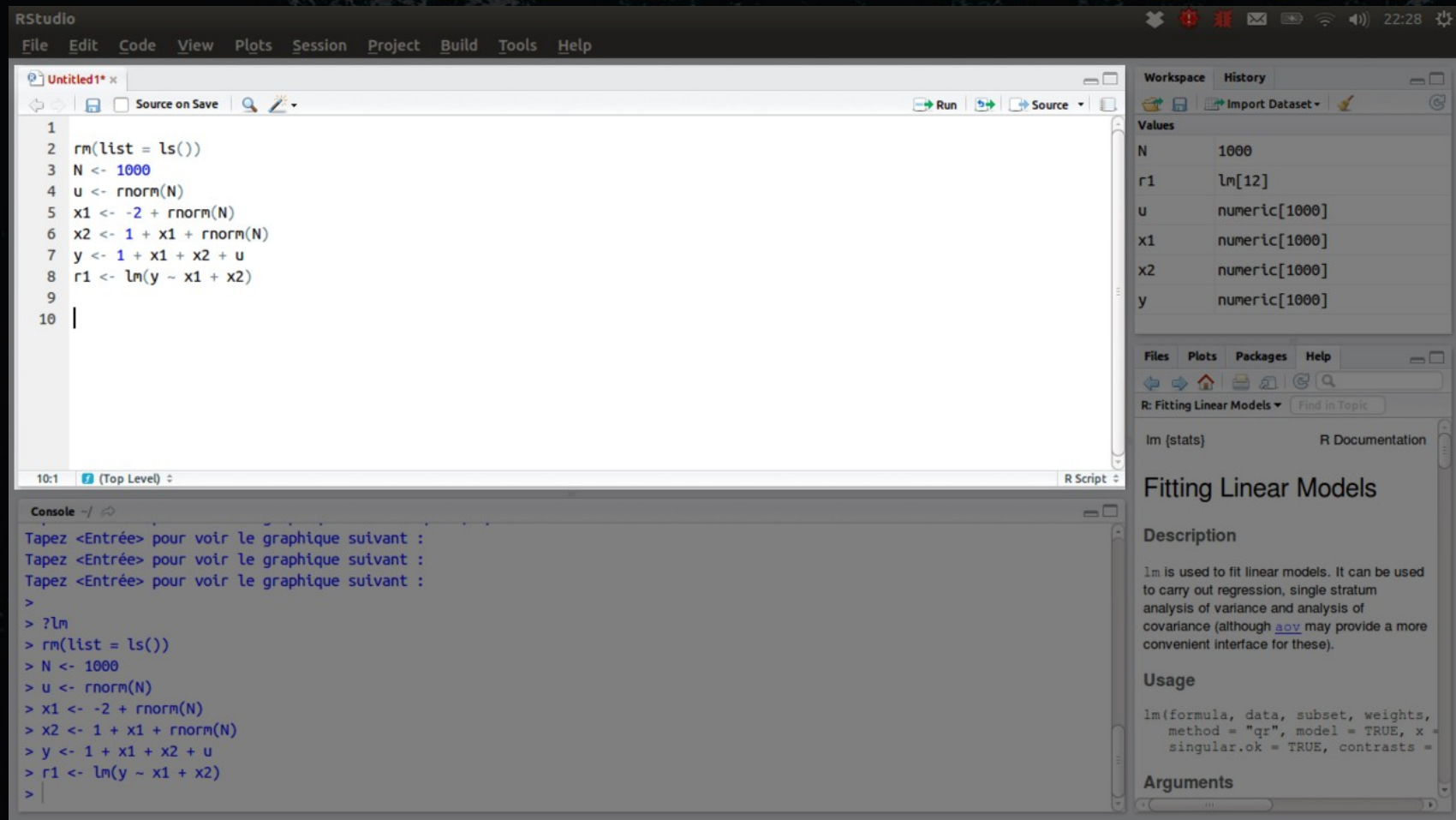
Object	Class
N	numeric
r1	lm
x1	numeric
x2	numeric
y	numeric
- Console:** The bottom-left window showing the output of the R script. The output is as follows:

```
> rm(list = ls())  
> N <- 1000  
> u <- rnorm(N)  
> x1 <- -2 + rnorm(N)  
> x2 <- 1 + x1 + rnorm(N)  
> y <- 1 + x1 + x2 + u  
> r1 <- lm(y ~ x1 + x2)  
>
```
- Fitting Linear Models Panel:** The bottom-right window showing the documentation for the `lm` function. It includes a description, usage, and arguments.



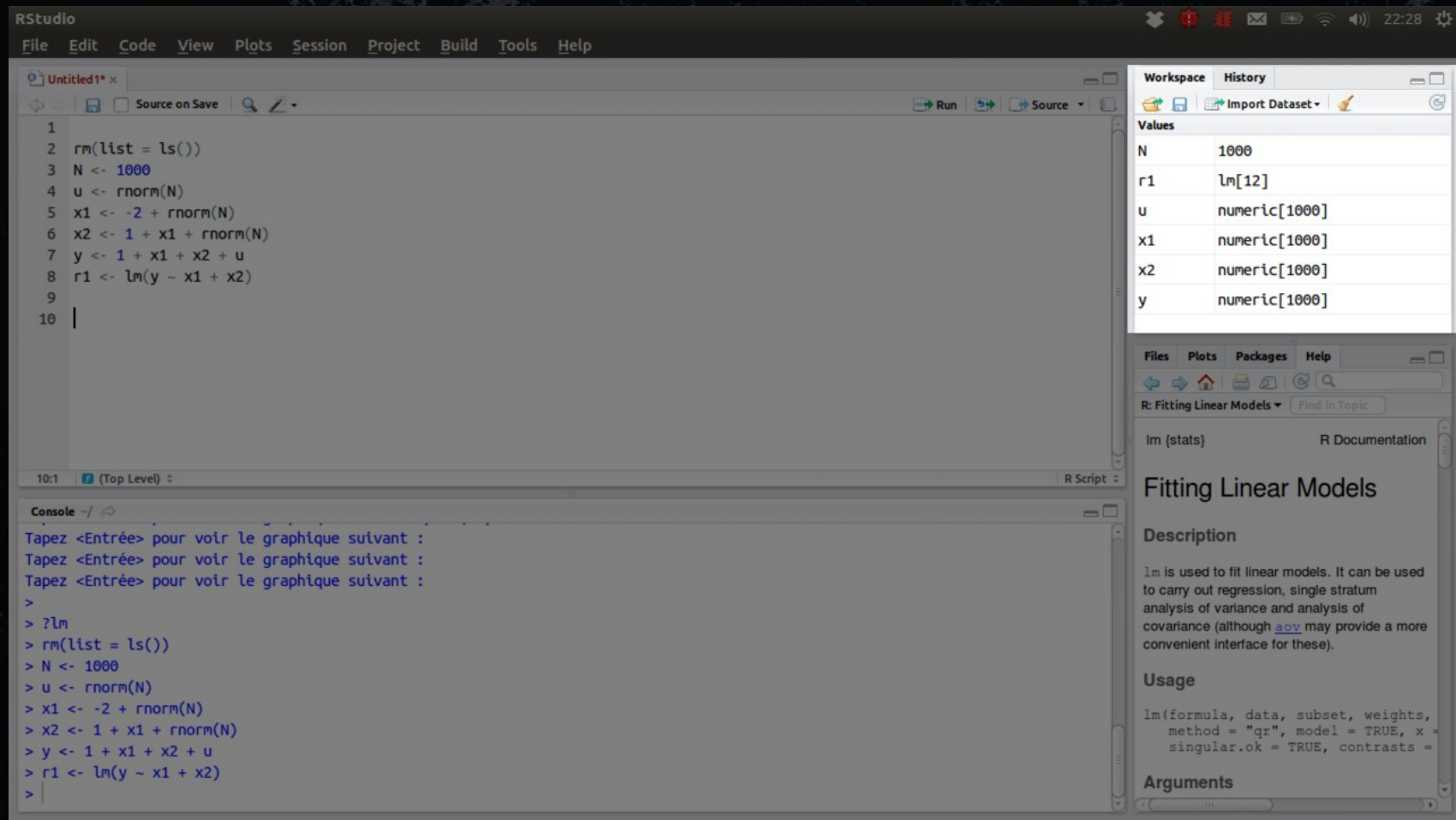
Console

A Window for communication



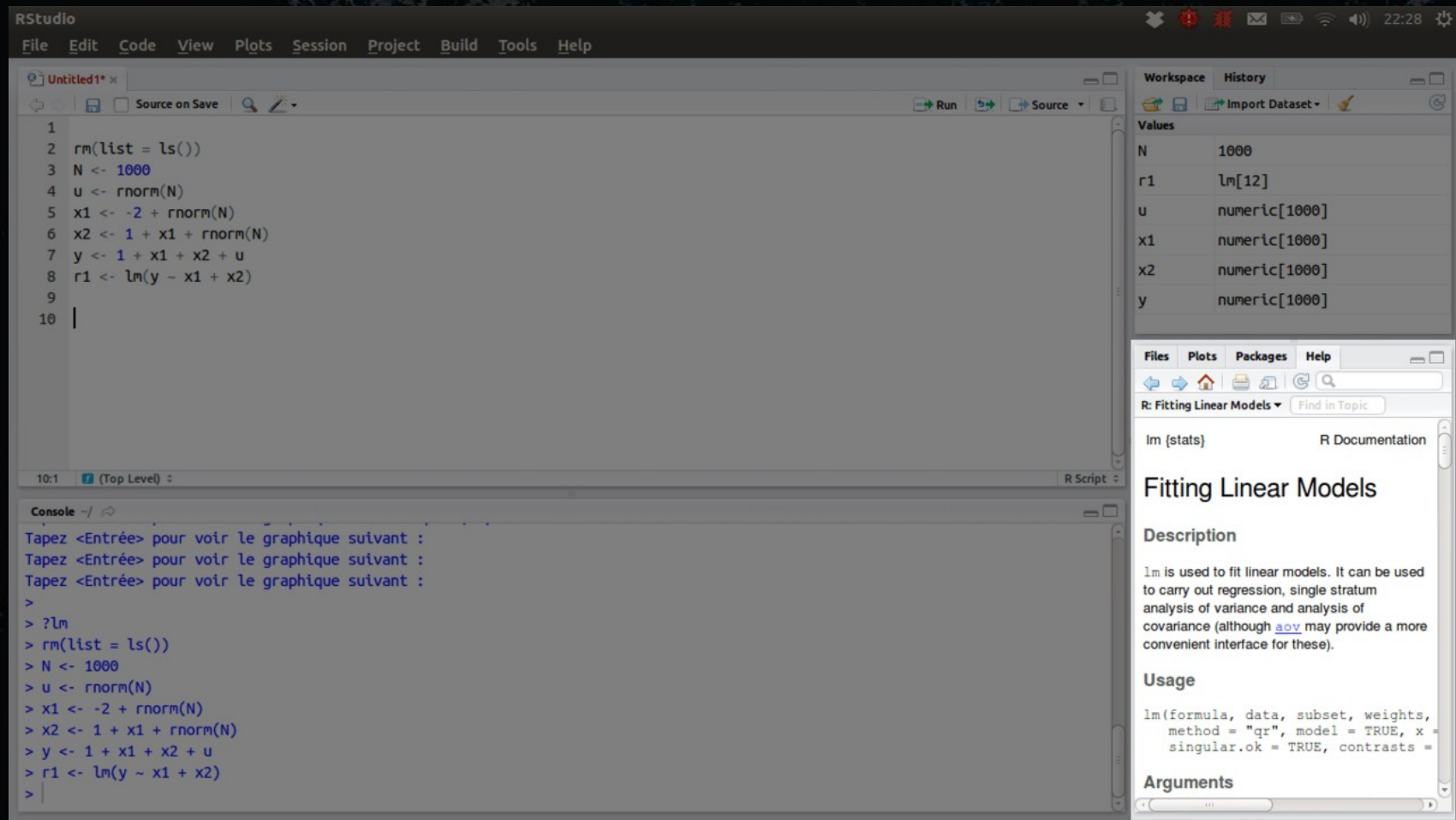
Script Editor

Script: Simple document with code



Workspace

It is the memory of R while we use it



Panel

Multiple functions: files / packages / plots / help

R is the engine, Rstudio is the interface

