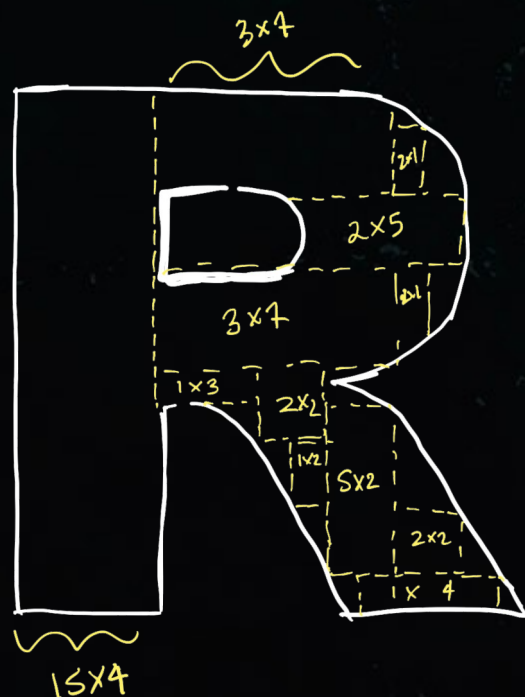


Introduction to R

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内容 *Content*

- 函数与包 *Functions and packages*
- 什么是函数？ *¿what is a function?*
- 什么是与包？ *¿what is a package?*

界面 *Interface*

- 什么是控制台？ *Console*
- 代码脚本？ *¿what is a script?*

Functions and packages

Functions

$f()$

Functions

$f(\text{argumento1} = \dots, \text{argumento 2} = \dots)$

Functions

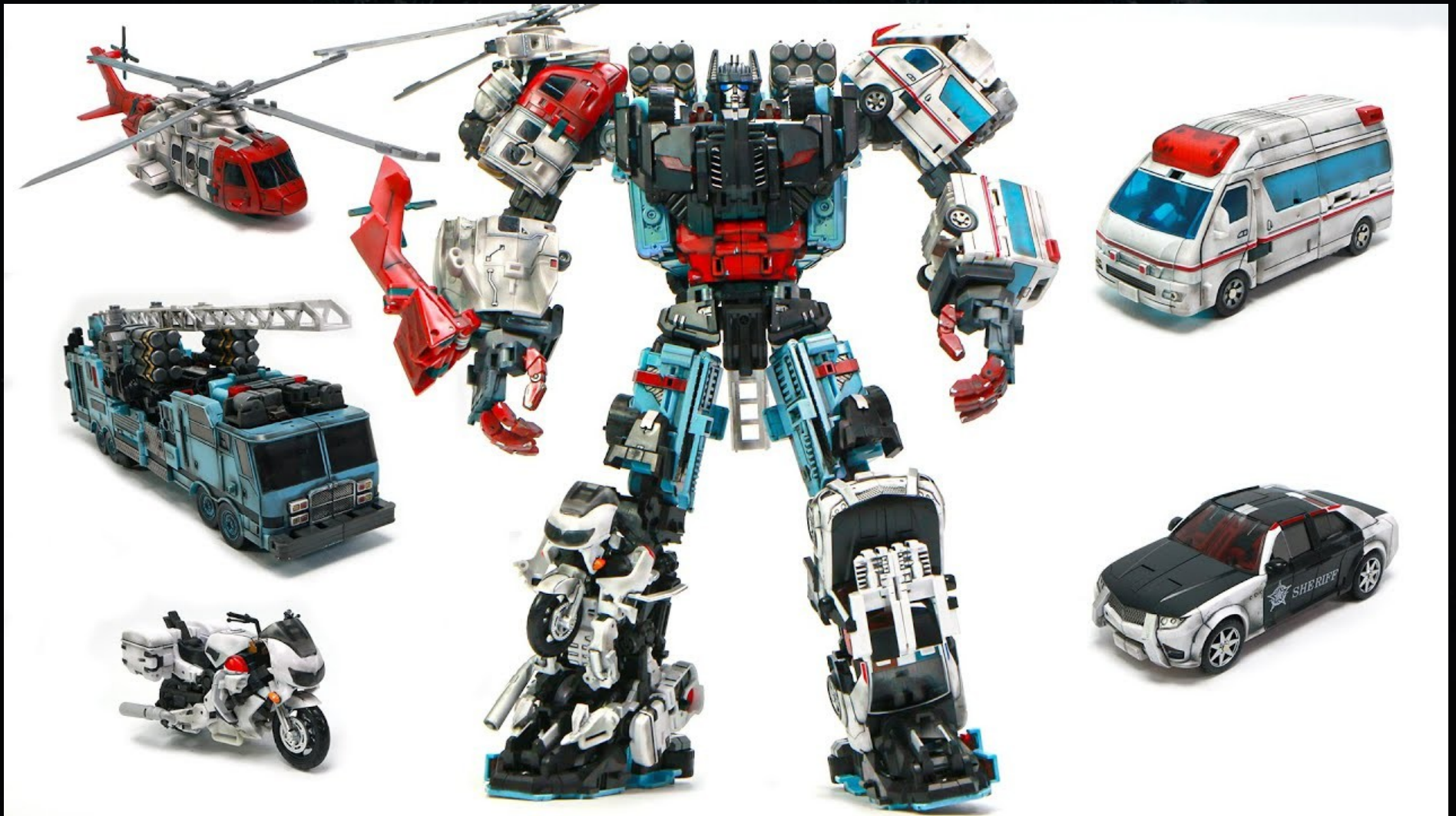
$\log(2)$

$\log_{10}(2)$

$\log(x=2)$

$\log_{10}(x=2)$

Functions

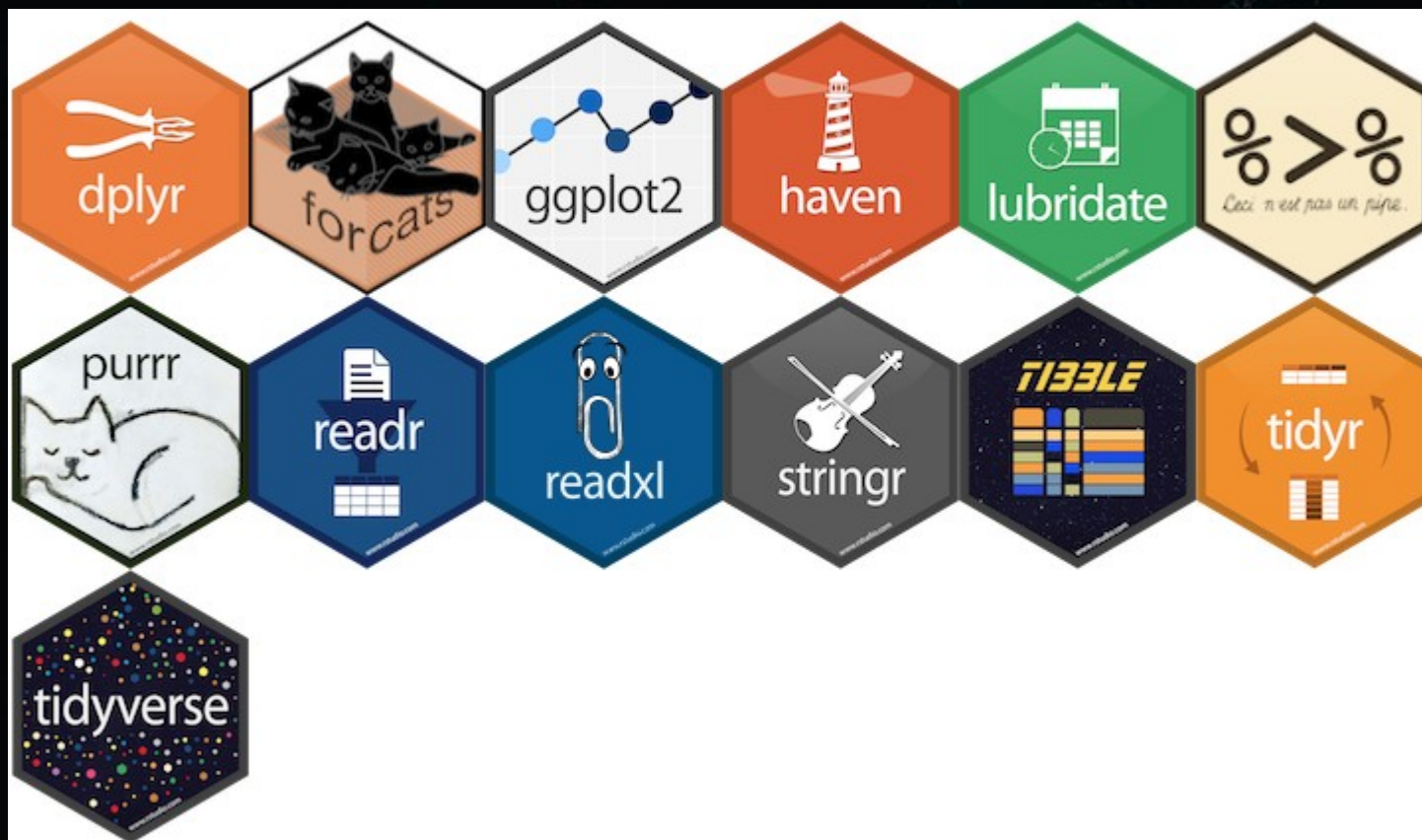


Packages



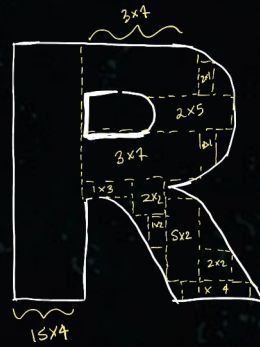
There is a basic R and the packages add functions to R

Packages



2022: 18728 packages

user



developer

Installation vs Activation

- `install.packages("ggplot2")`
 - Only once
 - Installed on the computer forever
- `library("ggplot2")`
 - Must activate each time I need to use it

Help

The screenshot displays the RStudio environment. The main editor window contains an R script with the following 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 window at the bottom shows the execution of the script, with prompts in French: "Tapez <Entrée> pour voir le graphique suivant :". The help panel on the right is open to the "lm" function documentation, titled "Fitting Linear Models".

Workspace

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

Help Panel: R: Fitting Linear Models

lm {stats} R Documentation

Fitting Linear Models

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 [aov](#) may provide a more convenient interface for these).

Usage

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

Arguments

- ?mifuncion()
- help()
- Panel / Help

help(log)

Console

The screenshot displays the RStudio environment. The top menu bar includes File, Edit, Code, View, Plots, Session, Project, Build, Tools, and Help. The source editor on the left contains 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 workspace panel on the right shows the following objects:

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

The console window at the bottom shows the following interaction:

```
Tapez <Entrée> pour voir le graphique suivant :  
Tapez <Entrée> pour voir le graphique suivant :  
Tapez <Entrée> pour voir le graphique suivant :  
>  
> ?lm  
> 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)  
>
```

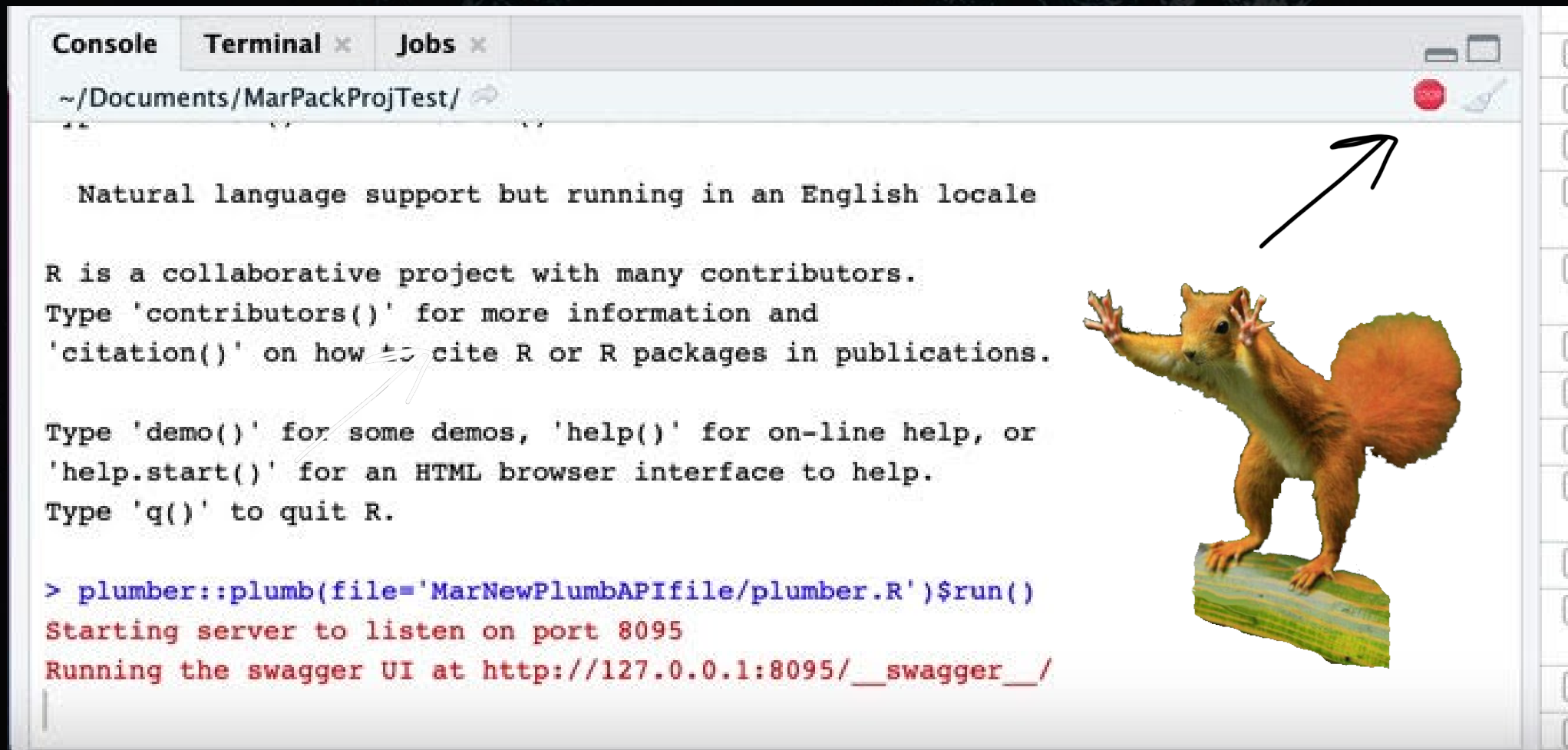
The right sidebar displays the documentation for the `lm` function, titled "Fitting Linear Models". It includes a description of the function's purpose, usage instructions, and a list of arguments.

This is the “window” by which we interact with the computer
We send messages and receive responses

Console

- STOP symbol
- Messages

Console



The screenshot shows an R console window titled 'Console' with tabs for 'Terminal' and 'Jobs'. The address bar shows the path '~/Documents/MarPackProjTest/'. The console output includes instructions on using R, followed by a command to start a plumber server. A red dot in the top right corner of the console window is highlighted by a hand-drawn black arrow. To the right of the console window is a cartoon illustration of a red squirrel standing on a log, with its arms raised in a 'wait' gesture.

```
~/Documents/MarPackProjTest/

Natural language support but running in an English locale

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.

> plumber::plumb(file='MarNewPlumbAPIfile/plumber.R')$run()
Starting server to listen on port 8095
Running the swagger UI at http://127.0.0.1:8095/__swagger__/
```

This symbol indicates that the computer is processing
Just be patient and wait...

Console

- Message

Just a message, result

```
> message("esto es un mensaje")  
esto es un mensaje
```

- Warning

It is not an error. Just warning about something

```
> library(cowsay)  
Warning message:  
package 'cowsay' was built under R version 4.1.3
```

- Error

The code does not work



```
> say()  
Error in say() : could not find function "say"
```

```
Error in say() : could not find function "say"  
> mean(c(uno,2,3))  
Error in mean(c(uno, 2, 3)) : object 'uno' not found
```

Script Editor

The screenshot displays the RStudio environment with the following components:

- Script Editor (Untitled1*):** Contains an R script for generating data and fitting a linear model.

```
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 |
```
- Console:** Shows the execution of the script commands.

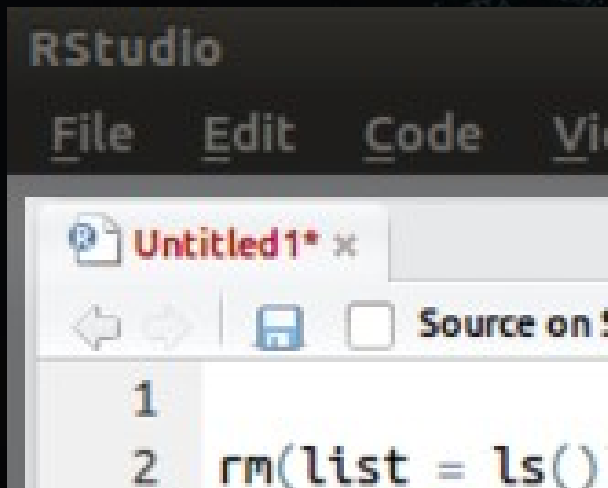
```
Tapez <Entrée> pour voir le graphique suivant :  
Tapez <Entrée> pour voir le graphique suivant :  
Tapez <Entrée> pour voir le graphique suivant :  
>  
> ?lm  
> rm(list = ls())  
> N <- 1000  
> u <- rnorm(N)  
> x1 <- -2 + rnorm(N)  
> x2 <- 1 + x1 + rnorm(N)  
> y <- 1 + x1 + x2 + u  
> r1 <- lm(y ~ x1 + x2)  
>
```
- Workspace:** Lists the objects created in the environment.



Object	Value
N	1000
r1	lm[12]
u	numeric[1000]
x1	numeric[1000]
x2	numeric[1000]
y	numeric[1000]
- Documentation Pane:** Displays the documentation for the `lm` function, titled "Fitting Linear Models".
 - 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 `av` may provide a more convenient interface for these).
 - Usage:**

```
lm(formula, data, subset, weights, method = "qr", model = TRUE, x.singular.ok = TRUE, contrasts = )
```
 - Arguments:** (The list of arguments is partially visible).

This is the MOST IMPORTANT: my script document
I can send sentences to console using CTRL+ENTER
I can make comments using hashtag (#)

Script Editor



 TP1_ejercicio.R
 TP2_ejercicio.R

Always save your code in a Script File (.R)
!!!THE MOST IMPORTANT!!!