



## Sesión 002. “Utilizando LaTeX en RStudio”

1480-Técnicas Estadísticas en Investigación de Mercados  
Grado en Estadística empresaria

Profesor: Xavier Barber i Vallés

Departamento: Estadística, Matemáticas e Informática

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# Técnicas Estadísticas en Análisis de Mercados

Lo que no se mide, lo que de alguna  
manera no se capta, NO EXISTE.

Teodoro Luque Martinez



# LATEX

## ESCRITURA CIENTÍFICA DE CALIDAD

# Instalar LaTeX

<http://www.latex-project.org>

---

Es un sistema de composición de textos, orientado a la creación de documentos escritos que presenten una alta calidad tipográfica. Por sus características y posibilidades, es usado de forma especialmente intensa en la generación de artículos y libros científicos que incluyen, entre otros elementos, expresiones matemáticas.

# Instalar LaTeX (windows©)

<http://www.latex-project.org>



## LaTeX – A document preparation system

LaTeX is a high-quality typesetting system; it includes features designed for *de facto* standard for the communication and publication of scientific documents.

### LaTeX the product

**What is LaTeX?**  
If you do not yet know what LaTeX is all about, have a look at our short introduction to LaTeX.

**The latest version of LaTeX**  
We provide a newsletter (as a PDF file) about each release of LaTeX created since 1994.

**Documentation**  
Each release of LaTeX provides a number of guides for users.

**Getting LaTeX**  
If you need to know how and where to get LaTeX, please have a look at our instructions.

**Getting help**  
If you are in trouble and need to get some help, please read our hints on where you might find help.

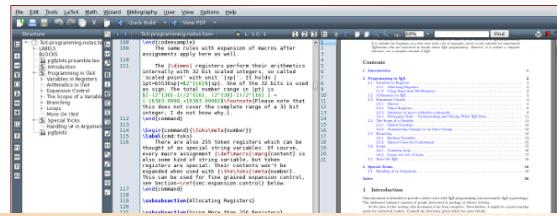
[LaTeX home](#)  
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**News**  
[Issue 24 of LaTeX2e news released  
\(February 11, 2016\)](#)  
[Issue 23 of LaTeX2e news released  
\(October 13, 2015\)](#)

## Texmaker | The universal LaTeX editor

Free cross-platform LaTeX editor since 2003 (Windows, MacOsX, Linux)

### Summary

Texmaker is a free, modern and cross-platform LaTeX editor for linux, macosx and windows systems that integrates many tools needed to just one application.  
Texmaker includes unicode support, spell checking, auto-completion, code folding and a built-in pdf viewer with synctex support and continous recompilation.  
Texmaker is easy to use and to configure.  
Texmaker is released under the GPL license .



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Want to install MiKTeX? Start with a tutorial:

[Howto: Install MiKTeX 2.9](#)  
[Howto: Install MiKTeX 2.9 on many client computers](#)

Want to support the project? Please [give back](#)!

### Package Repository

Version: 5897  
Date: 2/23/2016  
Packages: 3098  
Recent: unicode-data splitindex spath3 showhyphens roundrect reledmac rangen pmx miktex  
Updates: texinfo-base miktex-misc mima lroundrect inconsolata hyperxmp hobby graphicxsp gost forest fithesis fibeamer

# Instalar LaTeX

---

- Windows:
  - Ir a <http://miktex.org/download> y descargar el archivo que allí nos propone.
  - Una vez descargado seguir el [\*Howto: Install MiKTeX 2.9.\*](#) donde se detallan los pasos a seguir.
  - Instalar el editor para escribir LaTeX. Este paso lo podemos obviar si vamos a trabajar directamente desde el Rstudio.

# LaTeX tutoriales en castellano

---

- [http://www.ugr.es/~mmartins/material/latex\\_basico.pdf](http://www.ugr.es/~mmartins/material/latex_basico.pdf)
- [http://tecdigital.tec.ac.cr/revistamatematica/Libros/LATEX/LaTeX\\_2013.pdf](http://tecdigital.tec.ac.cr/revistamatematica/Libros/LATEX/LaTeX_2013.pdf)
- <http://www.cervantex.es/manuales>
- <http://www2.dis.ulpgc.es/~lalvarez/teaching/pi/latex/TutorialLatex.pdf>

```
\begin{document}  
maketitle  
\end {document}
```

# EMPEZANDO CON **LaTeX**

# Mi primer documento

---

```
\documentclass{article}

%preámbulo
\usepackage{lmodern}
\usepackage[T1]{fontenc}
\usepackage[spanish,activeacute]{babel}
\usepackage{mathtools}

\title{Hola Mundo}
\author{Escribe aquí tu nombre}

\begin{document}
% cuerpo del documento
\maketitle
    Mi primer documento en \LaTeX{}.
\end{document}
```

# Mi primer documento

---

Hola Mundo

Escribe tu nombre

22 de febrero de 2017

Mi primer documento en L<sup>A</sup>T<sub>E</sub>X.



# Mi primera presentación

---

```
\documentclass{beamer}
\title[Título corto]{Título largo}
\subtitle{...} % Opcional
\author{...}
\institute{...} % Opcional
\begin{document}
%Inicio de Trasparencias
\begin{frame}
\titlepage
\end{frame}
% fin de Trasparencias
\end{document}
```

# Mi primera presentación

---

```
\documentclass{beamer}
  \title[Título corto]{Mi primera presentación en LaTeX}
  \subtitle{El subtítulo} % Opcional \author{Xavier Barber}
\institute{Centro de Investigación Operativa} % Opcional
\begin{document}
%Portada presentación
\begin{frame}
  \titlepage
\end{frame}
%Inicio de Trasparencias
\begin{frame}
  \frametitle{Beamer-LaTeX y yo}
  Mi primera Presentación en Beamer-LaTeX
\end{frame}
% fin de Trasparencias
\end{document}
```

# Mi primera presentación en LaTeX

El subtítulo

Xavier Barber

Centro de Investigación Operativa

February 22, 2017

Beamer-LaTeX y yo

Mi primera Presentación en Beamer-LaTeX



# Cosas básicas

---

```
\begin{itemize}
```

```
  \item Primera opción
```

```
  \item Segunda opción
```

```
% y así ...
```

```
\end{itemize}
```

# Fórmulas básicas

---

$$\$x^2 + y^3 = 24\$$$

$$x^2 + y^3 = 24$$

$$\$ \frac{x^2}{y^3} = 24 \$$$

$$\frac{x^2}{y^3} = 24$$

# Más fórmulas

$x^y$	$x^y$	$\hat{x} \neq \bar{x}$
$x_y$	$x_y$	$f: X \rightarrow Y$
$x'$	$x'$	$\sqrt{x+2}$
$x''_{\{2\}}$	$x''_2$	$2 < x \leq 4$
$A^{1}_{\{2\}}$	$A_2^1$	$\frac{a \times b}{c - d}$
$3\pi/4$	$3\pi/4$	$\int_0^1 x^2 dx$
$x \in \Omega$	$x \in \Omega$	$A \cup B \subseteq C \cap D$

<https://en.wikibooks.org/wiki/LaTeX/Mathematics>

```

\begin{equation}\label{xx}
\begin{split}
a &= b+c-d \\
&\quad +e-f \\
&= g+h \\
&= i \\
\end{split}
\end{equation}

```

```

\begin{multline}
a+b+c+d+e+f \\
+i+j+k+l+m+n
\end{multline}

```

```

\begin{gather}
a_1=b_1+c_1 \\
a_2=b_2+c_2-d_2+e_2
\end{gather}

```

```

\begin{align}
a_1 &= b_1+c_1 \\
a_2 &= b_2+c_2-d_2+e_2
\end{align}

```

$$\begin{aligned}
 a &= b+c-d \\
 &\quad +e-f \\
 &= g+h \\
 &= i
 \end{aligned} \tag{2.1}$$

$$\begin{aligned}
 a+b+c+d+e+f \\
 +i+j+k+l+m+n
 \end{aligned} \tag{2.2}$$

$$a_1 = b_1 + c_1 \tag{2.3}$$

$$a_2 = b_2 + c_2 - d_2 + e_2 \tag{2.4}$$

$$a_1 = b_1 + c_1 \tag{2.5}$$

$$a_2 = b_2 + c_2 - d_2 + e_2 \tag{2.6}$$

The screenshot shows the RStudio interface with a Sweave document titled "binomialLattice.Rnw". The code implements a binomial lattice model for option pricing. It defines parameters like initial price (\$S\_0\$), growth rate (\$v\$), standard deviation (\$\sigma\$), and time steps (\$n\$). It then calculates probabilities and creates a matrix of prices. The workspace panel shows variables like \$priceMat\$ and \$probMat\$. The file browser panel shows generated files including PDF, TEX, and PNG outputs.

```
Price and Probability Matrix\\

p = $frac{1}{2}+frac{1}{2}(frac{v}{\sigma}\sqrt{\Delta t})\\
u = $e^{\sigma \sqrt{\Delta t}}\\
d = $e^{-\sigma \sqrt{\Delta t}}\\

If s(0) = 100, v = 12 %, \sigma = 20 %, \Delta t =
$frac{1}{4}\\

% Code Chunk 2
<<Code Chunk 2, fig=FALSE, include=FALSE, echo=FALSE,
results=hide >>

# setup

S0 <- 100           # initial price
v <- 0.12            # expected annual growth rate
sigma <- 0.20          # annual standard deviation
dT <- 1/4             # length of time step (in years)
nsteps <- 4            # number of time steps
exact <- F              # T for exact, F for approximate

if(exact) {
  p <- 0.5 + 0.5/sqrt(sigma^2/(v^2*dT)+1)
  u <- exp(sqrt(sigma^2*dT+(v*dT)^2))
  d <- exp(-sqrt(sigma^2*dT-(v*dT)^2))
} else {
  p <- 0.5 + 0.5*(v/sigma)*sqrt(dT)
  u <- exp(sigma*sqrt(dT))
  d <- exp(-sigma*sqrt(dT))
}

# create and plot price matrix
priceMat <- matrix(NA, ncol=nsteps+1, nrow=2*nsteps + 1,
  dimnames=list(as.character(nsteps:-nsteps),
  as.character(0:nsteps)))
priceMat["0","0"] <- S0
for(colnum in 1:nsteps ) {
  for(rownum in seq(colnum,-colnum,by=-2))
```

# RSTUDIO – SWEAVE -KNITR

# knitr

---

- Es un paquete que nos permitirá incorporar muchas funcionalidades del LaTeX al Rstudio, pudiendo crear documentos perfectamente maquetados y de edición muy depurada.
- El autor: <http://yihui.name/knitr/>
- Un blog muy interesante por muchos *posts*:
  - <http://statisticalecology.blogspot.com.es/2014/06/knitr-integrar-codigo-r-en-archivos-de.html>

# RStudio: Opciones Globales

Options

The screenshot shows the 'Sweave' tab selected in the left sidebar of the RStudio Options dialog. The main area displays global defaults for Sweave files.

**Program defaults (when not in a project)**

- Weave Rnw files using: **knitr** ?
- Typeset LaTeX into PDF using: **pdfLaTeX** ?

*NOTE: The Rnw weave and LaTeX compilation options are also set on a per-project (and optionally per-file) basis. Click the help icons above for more details.*

**LaTeX editing and compilation**

- Clean auxiliary output after compile
- Enable shell escape commands
- Insert numbered sections and subsections

**PDF preview**

- Preview PDF after compile using: **RStudio Viewer** ?
- Always enable Rnw concordance (required for synctex)

# Generando el Rnw

The screenshot shows the RStudio interface. On the left, a file type selector dropdown is open, showing options like R Script, R Markdown..., Shiny Web App..., Text File, C++ File, R Sweave, R HTML, R Presentation, and R Documentation. The R Sweave option is selected. In the main workspace, there are two tabs: 'Reto1.Rnw' and 'Untitled1'. The 'Reto1.Rnw' tab is active, displaying the following LaTeX code:

```
1 \documentclass{article}
2
3 \begin{document}
4
5
6
7
8 \end{document}
```

The 'Format' and 'Compile PDF' buttons are visible in the toolbar above the code editor.

# Encabezado

---

```
\documentclass[a4paper,10pt]{article}
\usepackage[left=1.5cm,top=2.5cm,right=1.5cm,
           bottom=2.5cm]{geometry} %margenes
\usepackage[spanish]{babel} %diccionario
\usepackage[utf8]{inputenc} %acentos
\usepackage{graphicx} %Insertar figuras
\usepackage{amsmath} % Fórmulas
\usepackage{amssymb} % Fórmulas
\usepackage{flushend} %si queremos 2 columnas
```

# Título del informe

---

```
\begin{document}
\SweaveOpts{concordance=TRUE}

\titulo{Sesión 005: Aprendiendo Sweave desde RStudio}
\author{Xavier Barber}
\date{}

\maketitle

\section{Primera Sección: El encabezado}
```

# Título del Informe

---

RStudio: View PDF

Page: 1 of 2    - | + Automatic Zoom

Sesión 005: Aprendiendo Sweave desde RStudio

Xavier Barber



# Empezando...

---

```
\pagebreak % esto sirve para hacer un salto de página  
\newpage    % y aquí empieza la nueva página
```

## **\section{Estadística descriptiva}**

A continuación se va a mostrar alguno ejemplos de mostrar descriptivos:

Leemos unos datos desde un paquete de  $\mathbb{R}$

```
<<leyendodatos>>= % a esto se le llama CHUNK  
data(mtcars)  
@ % Fin del CHUNK
```

Esto es un ejemplo de cómo se vería una orden a  $\mathbb{R}$ . % esto es una forma de escribir R

# Empezando...

---

## 1. Estadística descriptiva

A continuación se va a mostrar alguno ejemplos de mostrar descriptivos:  
Leemos unos datos desde un paquete de R

```
data(mtcars)
```

Esto es un ejemplo de cómo se vería una orden a R.

# Mi primera salida

---

Ahora podemos ejecutar un comando que devuelva una salida:

```
<<mi_primer_salida>>=  
summary(mtcars)
```

@

Ahora podemos ejecutar un comando que devuelva una salida:

```
summary(mtcars)
```

```
##      mpg          cyl          disp          hp
##  Min. :10.40    Min. :4.000    Min. : 71.1    Min. : 52.0
##  1st Qu.:15.43   1st Qu.:4.000    1st Qu.:120.8   1st Qu.: 96.5
##  Median :19.20   Median :6.000    Median :196.3   Median :123.0
##  Mean   :20.09   Mean   :6.188    Mean   :230.7   Mean   :146.7
##  3rd Qu.:22.80   3rd Qu.:8.000    3rd Qu.:326.0   3rd Qu.:180.0
##  Max.   :33.90   Max.   :8.000    Max.   :472.0   Max.   :335.0
##      drat         wt          qsec          vs
##  Min. :2.760    Min. :1.513    Min. :14.50    Min. :0.0000
##  1st Qu.:3.080   1st Qu.:2.581    1st Qu.:16.89   1st Qu.:0.0000
##  Median :3.695   Median :3.325    Median :17.71   Median :0.0000
##  Mean   :3.597   Mean   :3.217    Mean   :17.85   Mean   :0.4375
##  3rd Qu.:3.920   3rd Qu.:3.610    3rd Qu.:18.90   3rd Qu.:1.0000
##  Max.   :4.930   Max.   :5.424    Max.   :22.90   Max.   :1.0000
##      am          gear          carb
##  Min. :0.0000    Min. :3.000    Min. :1.000
##  1st Qu.:0.0000   1st Qu.:3.000    1st Qu.:2.000
##  Median :0.0000   Median :4.000    Median :2.000
##  Mean   :0.4062   Mean   :3.688    Mean   :2.812
##  3rd Qu.:1.0000   3rd Qu.:4.000    3rd Qu.:4.000
##  Max.   :1.0000   Max.   :5.000    Max.   :8.000
```

# Empezando...

---

Luego también podemos calcular variables y sólo ponerlas en el texto, para echo en el CHUNK pondremos 'echo=FALSE'.

```
<<echo=FALSE>>=
```

```
a<-134.99
```

```
@
```

Justo aquí arriba hemos puesto el CHUNK con el FALSE (No se visualiza nada).

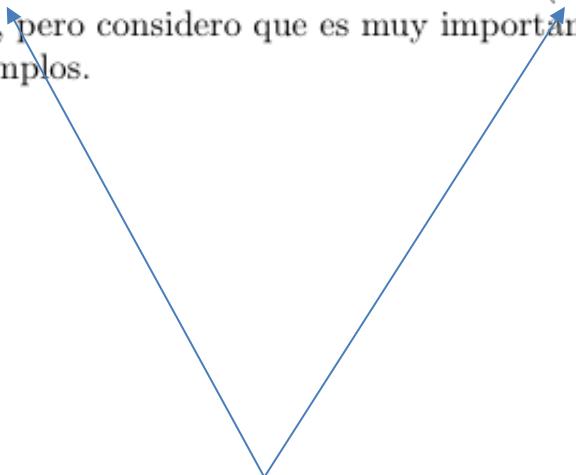
Y luego decir en el texto el valor de \textbf{a}=\text{a}.

Como podéis ver es bastante útil. Ya sé que hay que aprender mucho, pero considero que es muy importante para producir resultados estéticamente adecuados.

---

Luego también podemos calcular variables y sólo ponerlas en el texto, para echo en el CHUNK pondremos 'echo=FALSE'.

Justo aquí arriba hemos puesto el CHUNK con el FALSE (No se visualiza nada). Y luego decir en el texto el valor de **a**= 134.99. Para eso debemos de escribir `\Sexpr{a}`. Como podeis ver es bastante útil. Ya sé que hay que aprender mucho, pero considero que es muy importante para producir resultados estéticamente adecuados. Os voy a poner varios ejemplos.



`\Sexpr{variable_de_R}` devuelve su valor.

Esto es muy util para citar p-valores cuando escribimos

# Un pasito más

---

Os voy a poner varios ejemplos.

\pagebreak

\subsection{Ejemplos}

¿Cómo inserto un gráfico en el PDF que genero?

```
<<grafico1, include=TRUE>>=  
boxplot(mpg~am, data=mtcars)  
title("consumo x tipo de camb.")
```

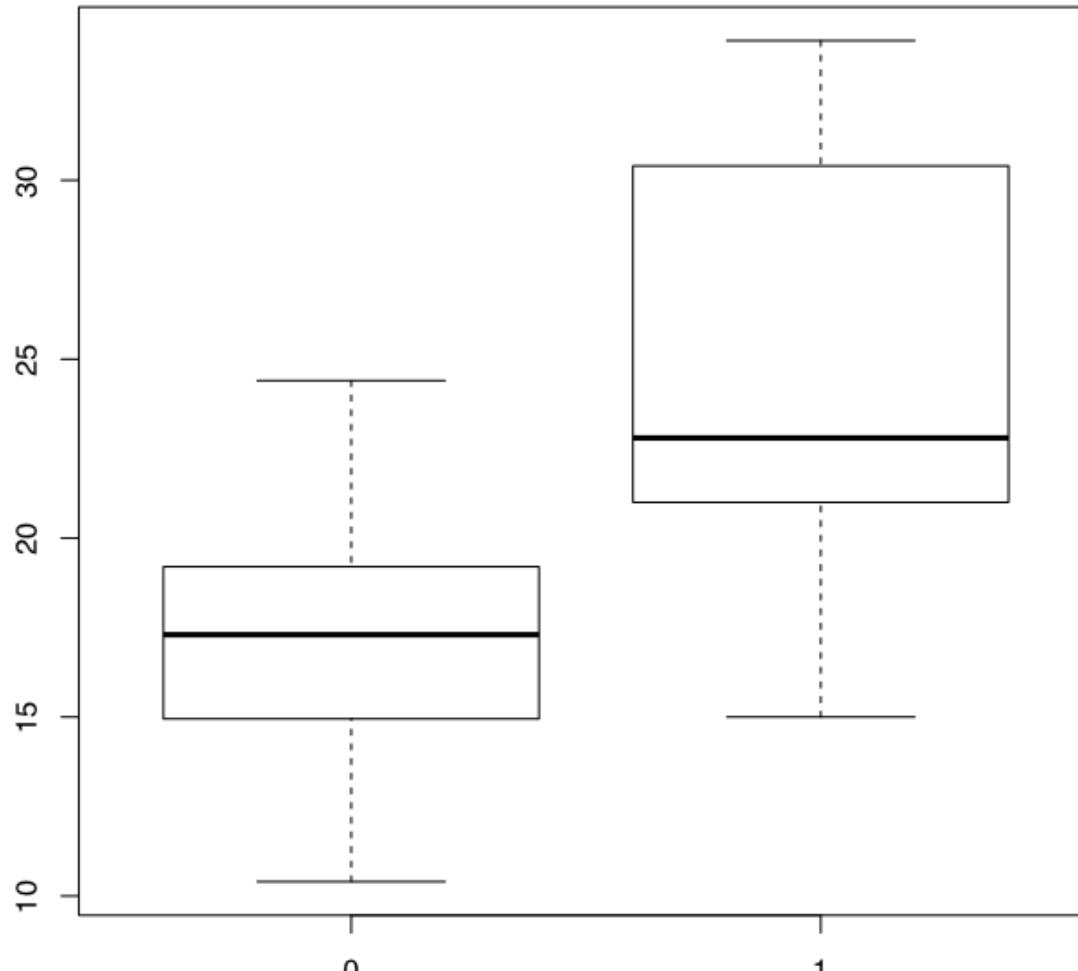
@

## 1.1. Ejemplos

¿Cómo inserto un gráfico en el PDF que genero?

```
boxplot(mpg~am, data=mtcars)
title("consumo (mpg) x tipo de cambio (Auto./Man.)")
```

**consumo (mpg) x tipo de cambio (Auto./Man.)**



# Mostrar mi data.frame

---

Aquí pongo un texto diciendo lo que voy a mostrar, y lo que voy a mostrar son los datos.:

```
\begin{table}[ht]
\centering
<<echo=F, results=hide>>=
ratones<-data.frame(Dosis=c("1","1","1","2","2","2","3","3","3"),
Contam=c(8.1,9.2,9.5,8.6,8.9,7.4,12,13.2,13.1),stringsAsFactors=c(F,T)
);as.factor(ratones$Dosis)
@
\caption{Datos de Contaminaci\'on a Diferentes Dosis}
\label{Datos de Contaminaci\'on a Diferentes Dosis}
\end{table}

<<echo=F, results=tex>>=
library(xtable)
xtable(ratones, digits=1)
@
```

```
1 \documentclass{article}
2
3 \usepackage[spanish]{babel} %diccionario
4 \usepackage[utf8]{inputenc} %acentos en mac
5
6
7 \begin{document}
8 \SweaveOpts{concordance=TRUE}
9
10
11 Aquí pongo un texto diciendo lo que voy a mostrar, y lo que voy a mostrar son los datos.:
12
13 \begin{table}[ht]
14 \centering
15 <<echo=F, results=hide>>=
16 ratones<-data.frame(Dosis=c("1","1","1","2","2","2","3","3","3"), Contam=c(8.1,9.2,9.5,8.6,8.9,7.4,12,13.2,13.1),stringsAsFactors=c(F,T));as.factor(ratones$Dosis)
17 @
18 \caption{Datos de Contaminaci\'on a Diferentes Dosis}
19 \label{Datos de Contaminaci\'on a Diferentes Dosis}
20 \end{table}
21 \
22
23 <<echo=F,results=tex>>=
24 library(xtable)
25 xtable(ratones, digits=1)
26 @
27
28
29
30 \end{document}|
```

Aquí pongo un texto diciendo lo que voy a mostrar, y lo que voy a mostrar son los datos.:

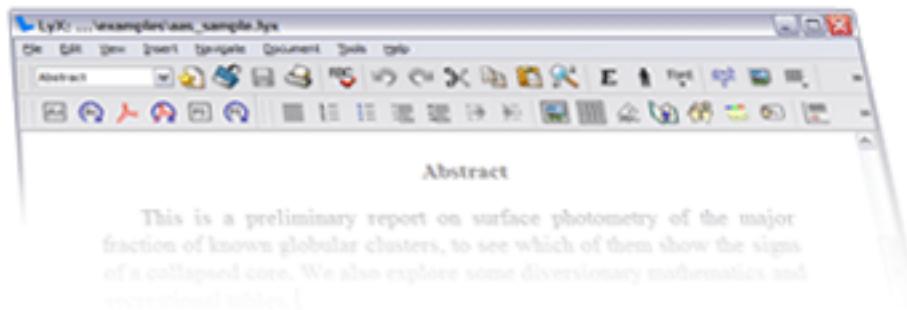
Cuadro 1: Datos de Contaminación a Diferentes Dosis

	Dosis	Contam
1	1	8.1
2	1	9.2
3	1	9.5
4	2	8.6
5	2	8.9
6	2	7.4
7	3	12.0
8	3	13.2
9	3	13.1

# ¿Y si no se mucho LaTeX?

---

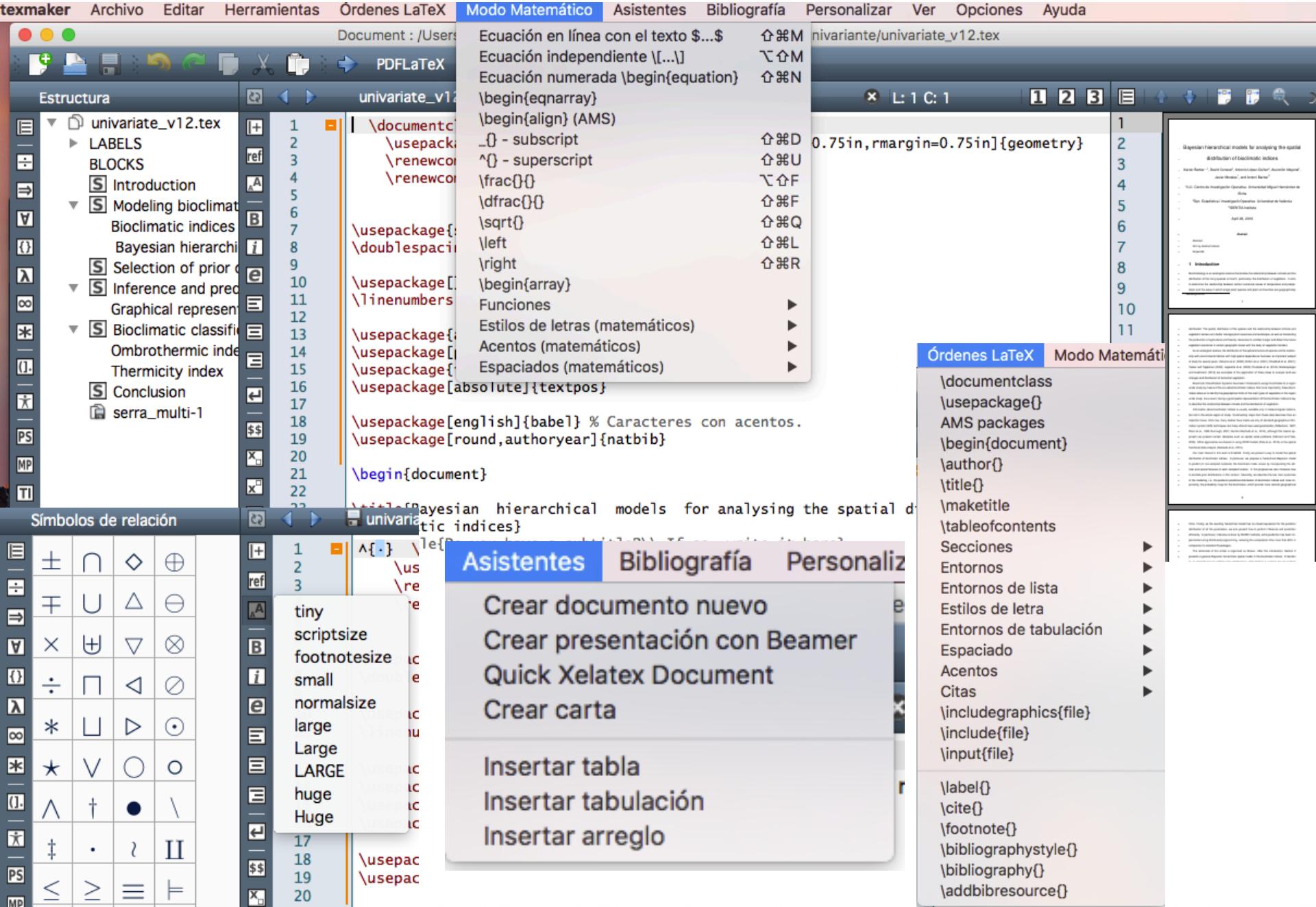
- Puedes utilizar un editor de LaTeX y desde ahí copiar y pegar lo que necesites, o incluso combinar editores del estilo wysiwyg como el LyX.



# TexMaker

---

- Es un editor-Compilador-Visualizador de LaTeX.
- Lleva asistentes que ayudan a realizar tablas, insertar gráficos, etc. generando el código LaTeX necesario sin necesidad de dominar todas las instrucciones



# Tutoriales Sweave - knitr

---

- [https://cran.r-project.org/doc/contrib/Rivera-Tutorial\\_Sweave.pdf](https://cran.r-project.org/doc/contrib/Rivera-Tutorial_Sweave.pdf)
- <https://stat.ethz.ch/R-manual/R-devel/library/utils/doc/Sweave.pdf>

# R / RStudio

- **R**: Lenguaje de programación orientado a análisis de datos
- **RStudio**: GUI para R
  - Probablemente una de las más potentes herramientas para el análisis de datos

## RSTUDIO: EL GIGANTE DORMIDO

# Tipos de Documentos

---

- En RStudio podemos hacer más cosas a parte de crear un archivo \*.R con una sintaxis y ejecutarla.
- Podemos:
  - Crear un proyecto y olvidarnos de dónde guardamos las cosas
  - Generar salidas de los resultados de forma atractiva
    - HTML5, LATEX, WORD, etc.

# Opciones de RStudio

The image shows two side-by-side screenshots of the RStudio Options dialog. Both dialogs have a header bar with tabs: 'General' (selected), 'Code', 'Appearance', 'Pane Layout', 'Packages', 'Sweave', 'Spelling', 'Git/SVN', and 'Publishing'. The left dialog is titled 'Options' and has a sidebar with the same tab names. It contains sections for 'Default working directory (when not in a project)' (with a 'Browse...' button) and various checkboxes for session restoration, workspace saving, and error handling. The right dialog is also titled 'Options' and has tabs for 'Editing', 'Display', 'Saving', 'Completion', and 'Diagnostics'. It includes sections for 'General' (checkboxes for inserting spaces for tabs, matching parens/quotes, auto-indent, and vertical alignment), 'Execution' (checkboxes for saving scripts before sourcing and focusing the console), and 'Snippets' (checkbox for enabling code snippets). Both dialogs have 'OK', 'Cancel', and 'Apply' buttons at the bottom.

Options

General

Code

Appearance

Pane Layout

Packages

Sweave

Spelling

Git/SVN

Publishing

Default working directory (when not in a project): ~

Re-use idle sessions for project links

Restore most recently opened project at startup

Restore previously open source documents at startup

Restore .RData into workspace at startup

Save workspace to .RData on exit:

Always save history (even when not saving .RData)

Remove duplicate entries in history

Show .Last.value in environment listing

Use debug error handler only when my code contains errors

Automatically expand tracebacks in error inspector

Automatically notify me of updates to RStudio

Options

General

Code

Appearance

Pane Layout

Packages

Sweave

Spelling

Git/SVN

Publishing

Editing

Display

Saving

Completion

Diagnostics

General

Insert spaces for tab  
Tab width

Insert matching parens/quotes

Auto-indent code after paste

Vertically align arguments in auto-indent

Soft-wrap R source files

Continue comment when inserting new line

Surround selection on text insertion:

Keybindings:

Execution

Always save R scripts before sourcing

Focus console after executing from source

Snippets

Enable code snippets  ?

OK Cancel Apply

OK Cancel Apply

# Opciones de RStudio

The image shows two side-by-side screenshots of the RStudio Options dialog. The left screenshot displays the 'Appearance' section, while the right one shows the 'Pane Layout' section.

**Left Screenshot (Appearance):**

- Editor font:** CourierStd
- Font size:** 12
- Editor theme:** Cobalt (selected)
- Code themes:** Ambiance, Chaos, Chrome, Clouds Midnight, Clouds, Crimson Editor, Dawn, Dreamweaver, Eclipse, Idle Fingers, Katzenmilch, Kr Theme, Merbivore Soft, Merbivore, Mono Industrial, Monokai, Pastel On Dark, Solarized Dark, Solarized Light, TextMate

A preview pane on the right shows R code for a plotting function, with Cobalt theme styling applied.

**Right Screenshot (Pane Layout):**

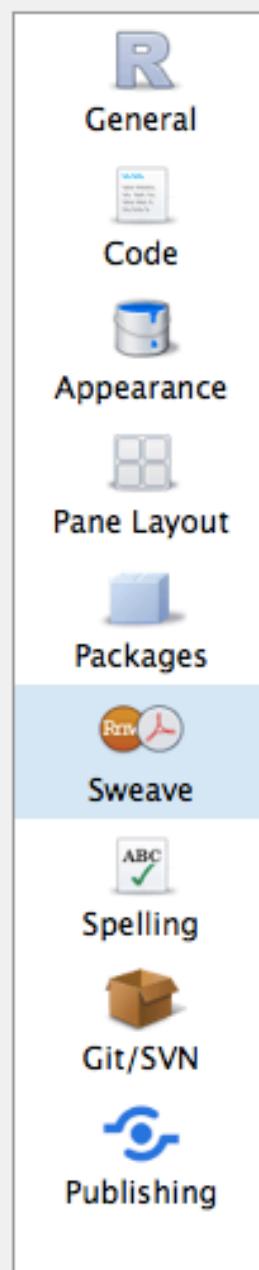
Choose the layout of the panes in RStudio by selecting from the controls each quadrant.

- Source:** Selected
- Console:** Selected
- Environment, History, Build, VCS:** Selected
- Files, Plots, Packages, Help, Viewer:** Selected

**Pane Layout controls:**

- Environment
- History
- Files
- Plots
- Packages
- Help
- Build
- VCS
- Viewer

Buttons at the bottom: OK, Cancel, Apply.



## Program defaults (when not in a project)

Weave Rnw files using:  Sweave  knitr

Typeset LaTeX into PDF using:

*NOTE: The Rnw weave and LaTeX compilation options are also set on a per-project (and optionally per-file) basis. Click the help icons above for more details.*

### LaTeX editing and compilation

Clean auxiliary output after compile

Enable shell escape commands

Insert numbered sections and subsections

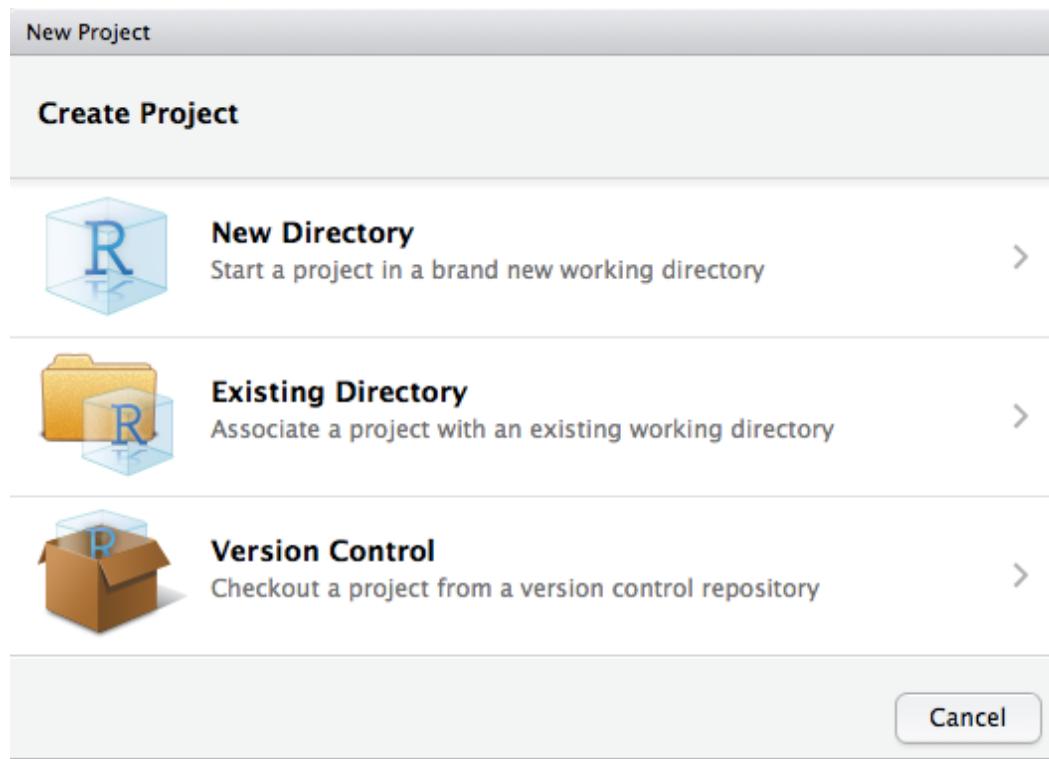
### PDF preview

Preview PDF after compile using:

Always enable Rnw concordance (required for synctex)

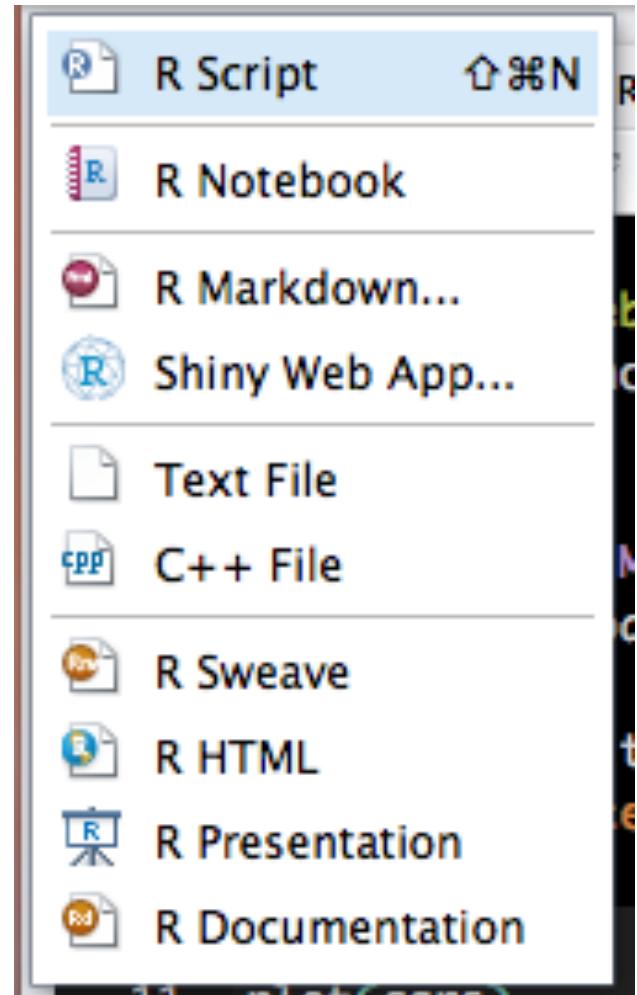
# Creando un Nuevo Proyecto

- Archivo → Nuevo Proyecto



# Tipo de Documento a Crear

- Sintaxis o Código de R
- R Notebook
- Documento tipo Markdown
- Aplicación Web de Shiny
- Archivo de Texto
- Sintaxis o código de C++
- Documento tipo Swave
- HTML
- Una presentación de R
- Un archivo de Documentacion de R



# MARKDOWN

# Text	Headers	Blockquotes
## Text	<h2>Text</h2>	<blockquote><p>Lorem ipsum dolor sit amet</p></blockquote>
### Text	<h3>Text</h3>	<blockquote><p>Lorem ipsum dolor sit amet</p></blockquote>
#### Text	<h4>Text</h4>	<blockquote><p>Lorem ipsum dolor sit amet</p></blockquote>
##### Text	<h5>Text</h5>	<blockquote><p>Level a</p></blockquote><blockquote><p>Level b</p></blockquote>
##### Text	<h6>Text</h6>	<blockquote><p>Level c</p></blockquote>
Lists		Inline Code
* Sizes * Shapes * Colors * Blue * Green	<ul style="list-style-type: none"><li>&lt;li&gt;Sizes&lt;/li&gt;</li><li>&lt;li&gt;Shapes&lt;/li&gt;</li><li>&lt;li&gt;Colors<ul style="list-style-type: none"><li>&lt;li&gt;Blue&lt;/li&gt;</li><li>&lt;li&gt;Green&lt;/li&gt;</li></ul></li></ul>	Use `<div>` tags ``echo `uname -a``
		Use <code>&lt;div&gt;</div></code>echo `uname -a`<
Code Blocks		Code Blocks
		<pre>Normal text</pre>

# MARKDOWN

# Markdown

---

- Markdown es un lenguaje de marcado que **facilita la aplicación de formato** a un texto empleando una serie de caracteres de una forma especial.
- En principio, fue pensado para elaborar textos cuyo destino iba a ser la web con más rapidez y sencillez que si estuviésemos empleando directamente HTML.

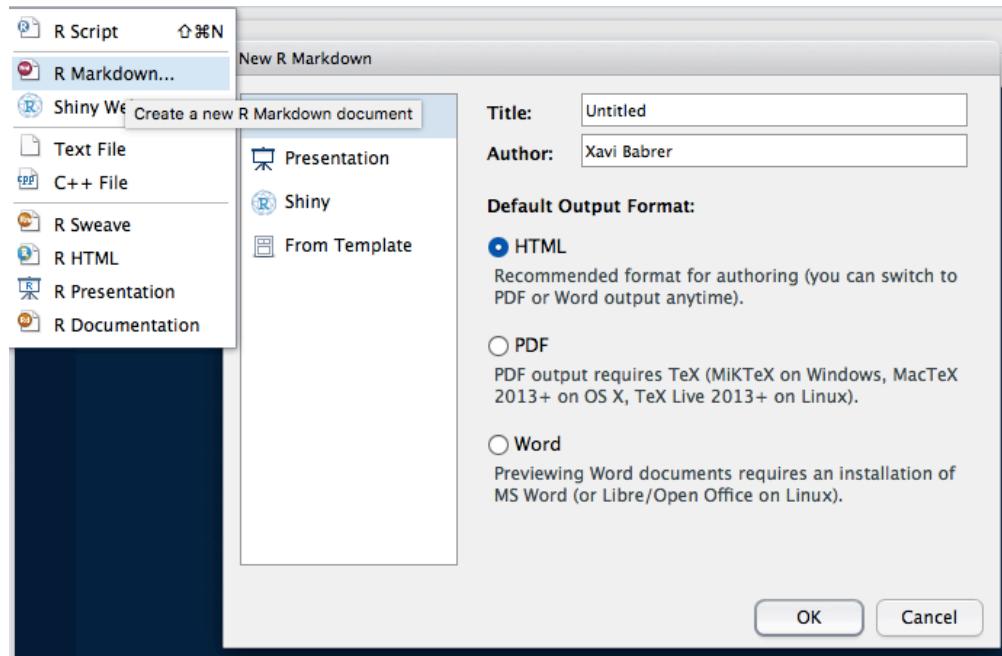
# Markdown

- En este enlace podréis encontrar un buen resumen de cómo funciona Markdown en Rstudio: [Enlace](#).

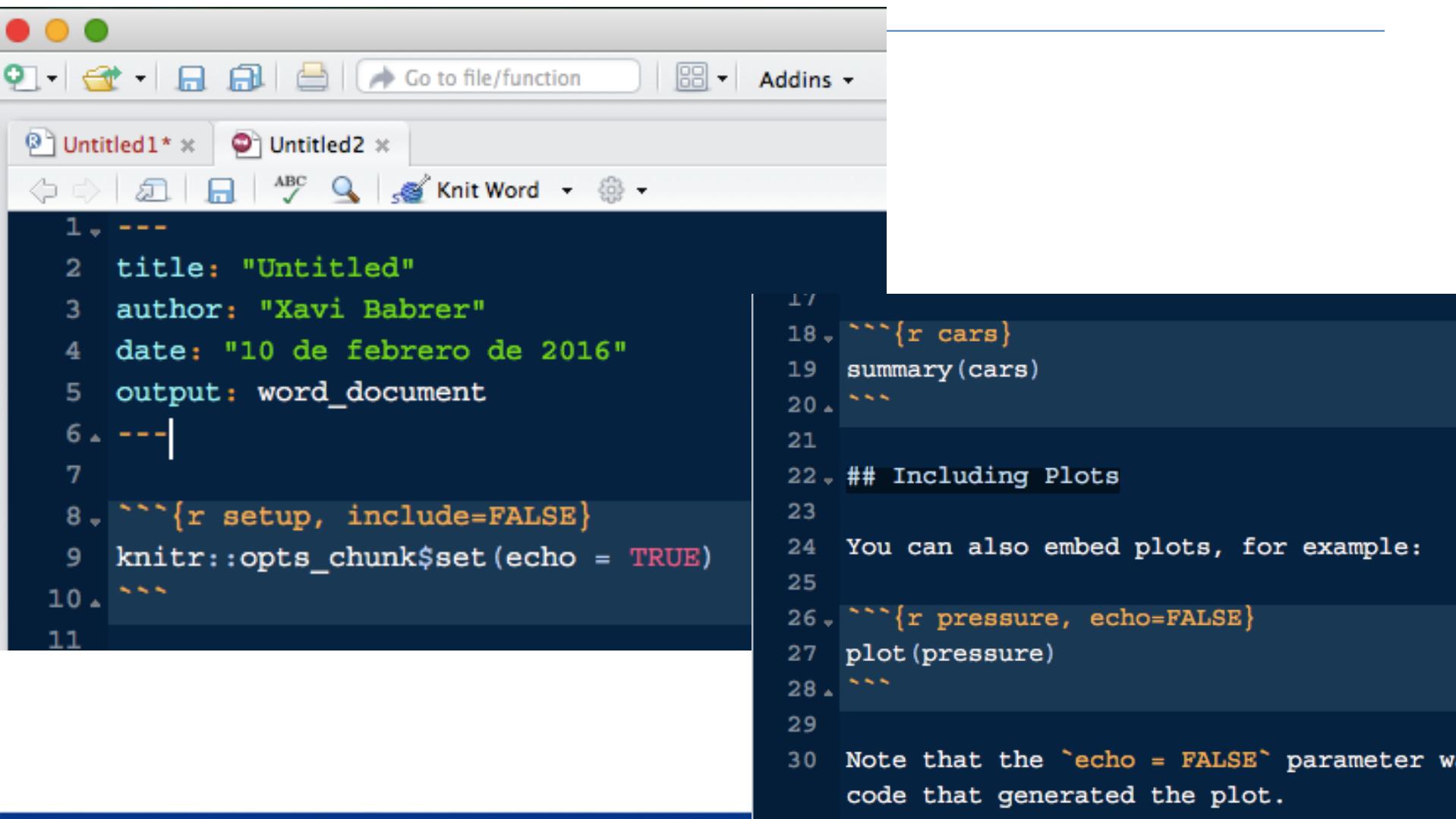


# Markdown Ejemplo (I)

```
install.packages("rmarkdown")
install.packages("knitr")
library(rmarkdown)
library(knitr)
```



# Markdown Example (I)



The screenshot shows the RStudio interface with a Knit Word document open. The top menu bar includes 'File', 'Edit', 'View', 'Insert', 'Tools', 'Help', and 'Addins'. The toolbar below has icons for file operations like Open, Save, Print, and Go to file/function. The main workspace displays the following R code:

```
1. ---
2. title: "Untitled"
3. author: "Xavi Babrer"
4. date: "10 de febrero de 2016"
5. output: word_document
6. ---
7.
8. ```{r setup, include=FALSE}
9. knitr::opts_chunk$set(echo = TRUE)
10.
11.
```

The right pane shows the generated Word document content:

```
17.
18. summary(cars)
19. summary(cars)
20. summary(cars)
21.
22. ## Including Plots
23.
24. You can also embed plots, for example:
25.
26. plot(pressure)
27. plot(pressure)
28. plot(pressure)
29.
30. Note that the `echo = FALSE` parameter was
   omitted from the code that generated the plot.
```

# Markdown Example (I)



## Untitled

Xavi Babrer  
10 de febrero de 2016

### R Markdown

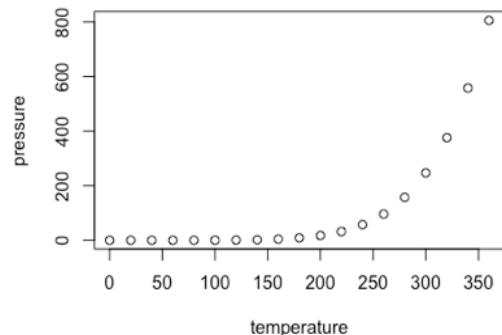
This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see <http://rmarkdown.rstudio.com>.

When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
summary(cars)
##      speed      dist
## Min. :4.0  Min. : 2.00
## 1st Qu.:12.0 1st Qu.:26.00
## Median :15.0 Median :36.00
## Mean   :15.4 Mean   :42.98
## 3rd Qu.:19.0 3rd Qu.:56.00
## Max.   :25.0 Max.  :120.00
```

### Including Plots

You can also embed plots, for example:



# Markdown Example (II)

---

- eval TRUE Whether to evaluate the code and include its results
- echo TRUE Whether to display code along with its results
  
- warning TRUE Whether to display warnings
- error FALSE Whether to display errors
- message TRUE Whether to display messages
- tidy FALSE Whether to reformat code in a tidy way when displaying it
- results "markup" "markup", "asis", "hold", or "hide"
- cache FALSE Whether to cache results for future renders
- comment "##" Comment character to preface results with
- fig.width 7 Width in inches for plots created in chunk
- fig.height 7 Height in inches for plots created in chunk

# Markdown Example (II)

---

```
## creando dos variables X e Y

```{r }
x <- 1:10
y <- round(rnorm(10, x, 1), 2)
df <- data.frame(x, y)
df```

### y ahora la salida de esto:

```{r , results='asis', echo=FALSE}
cat("Here are some dot points\n\n")
cat(paste("* The value of y[", 1:3, "] is ", y[1:3],
sep="", collapse="\n"))```

```

# Markdown Example (II)

```
## creando dos variables X e Y

```{r }
x <- 1:10
y <- round(rnorm(10, x, 1), 2)
df <- data.frame(x, y)
df```

### y ahora la salida de esto:

```{r , results='asis', echo=FALSE}
cat("Here are some dot points\n\n")
cat(paste("* The value of y[", 1:3, "] is ", y[1:3],
sep="", collapse="\n"))
```

```

## Creando dos variables X e Y

```
x <- 1:10
y <- round(rnorm(10, x, 1), 2)
df <- data.frame(x, y)
df
##      x     y
## 1  1 1.79
## 2  2 1.45
## 3  3 3.07
## 4  4 3.72
## 5  5 4.58
## 6  6 6.56
## 7  7 7.32
## 8  8 7.38
## 9  9 9.05
## 10 10 10.11
```

## y ahora la salida de esto:

Here are some dot points

The value of y[1] is 1.79

The value of y[2] is 1.45

The value of y[3] is 3.07



# Markdow Example (III)

---

```
## Una tabla  
`{r , results='asis', echo=FALSE}  
  
cat("x | y", "---- | ----", sep="\n")  
  
cat(apply(df, 1, function(X) paste(X,  
collapse=" | ")), sep = "\n")`
```

## Una tabla

| x  | y    |
|----|------|
| 1  | 1.8  |
| 2  | 1.01 |
| 3  | 2.18 |
| 4  | 6.27 |
| 5  | 5.4  |
| 6  | 4.37 |
| 7  | 6.33 |
| 8  | 9.1  |
| 9  | 8.46 |
| 10 | 9.85 |



# Markdown Example (iv)

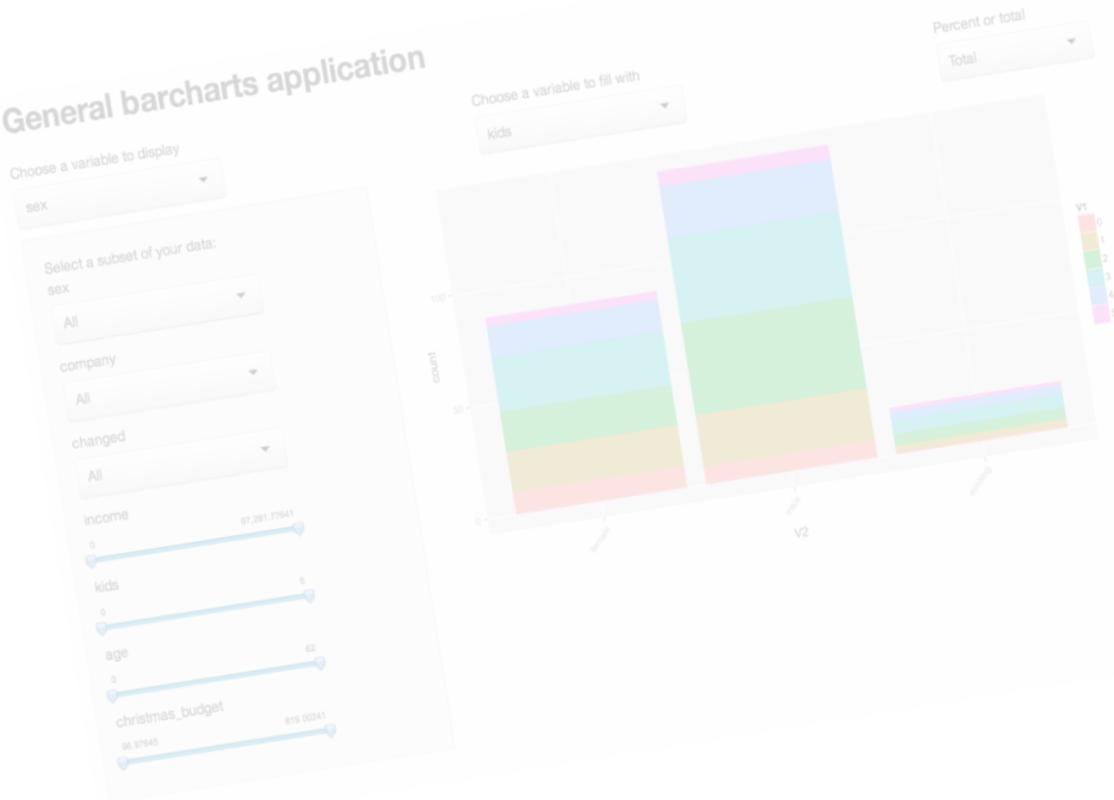
---

| Symbol | Meaning                | Example |
|--------|------------------------|---------|
| %d     | day as a number (0-31) | 01-31   |
| %a     | abbreviated weekday    | Mon     |
| %A     | unabbreviated weekday  | Monday  |
| %m     | month (00-12)          | 00-12   |
| %b     | abbreviated month      | Jan     |
| %B     | unabbreviated month    | January |
| %y     | 2-digit year           | 07      |
| %Y     | 4-digit year           | 2007    |

# Markdown Example (iv)

| Symbol | Meaning                | Example |
|--------|------------------------|---------|
| %d     | day as a number (0-31) | 01-31   |
| %a     | abbreviated weekday    | Mon     |
| %A     | unabbreviated weekday  | Monday  |
| %m     | month (00-12)          | 00-12   |
| %b     | abbreviated month      | Jan     |
| %B     | unabbreviated month    | January |
| %y     | 2-digit year           | 07      |
| %Y     | 4-digit year           | 2007    |

## General barcharts application



# Shiny: creando aplicaciones web desde rstudio

# ¿Qué es Shiny?

Crea aplicaciones web interactivas (apps) desde R.

---

- Shiny es una herramienta para crear fácilmente aplicaciones web interactivas (apps) que permiten a los usuarios interactuar con sus datos sin tener que manipular el código.

```
install.packages("shiny")
library(shiny)
runExample("01_hello")
```

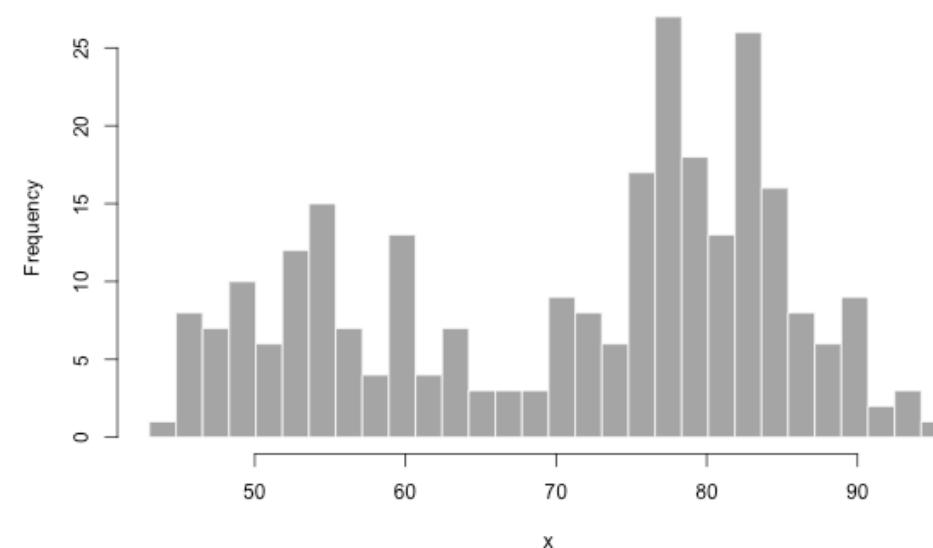


# Hello Shiny!

Number of bins:

1 6 11 16 21 26 31 36 41 46 50

Histogram of x



## Hello Shiny!

by RStudio, Inc.

This small Shiny application demonstrates Shiny's automatic UI updates. Move the *Number of bins* slider and notice how the `renderPlot` expression is automatically re-evaluated when its dependant, `input$bins`, changes, causing a histogram with a new number of bins to be rendered.

server.R

ui.R

show with app

```
library(shiny)

# Define server logic required to draw a histogram
shinyServer(function(input, output) {

  # Expression that generates a histogram. The expression is
  # wrapped in a call to renderPlot to indicate that:
  #
  # 1) It is "reactive" and therefore should be automatically
  #    re-executed when inputs change
  # 2) Its output type is a plot

  output$distPlot <- renderPlot({
    x      <- faithful[, 2] # Old Faithful Geyser data
    bins <- seq(min(x), max(x), length.out = input$bins + 1)

    # draw the histogram with the specified number of bins
    hist(x, breaks = bins, col = 'darkgray', border = 'white')
  })
})
```

# Shiny

---

- Se necesita un “script” que será la *interface* y otra “script” que será el *server*:
  - Server.R
  - ui.R
- Se puede probar a nivel local, o bien en un repositorio o más a nivel profesional desde un Rstudio Server.

# Shiny: server.R

---

```
library(shiny)

# Define server logic required to draw a histogram
shinyServer(function(input, output) {

  # Expression that generates a histogram. The expression is
  # wrapped in a call to renderPlot to indicate that:
  #
  # 1) It is "reactive" and therefore should be automatically
  #    re-executed when inputs change
  # 2) Its output type is a plot

  output$distPlot <- renderPlot({
    x   <- faithfull[, 2] # Old Faithful Geyser data
    bins <- seq(min(x), max(x), length.out = input$bins + 1)

    # draw the histogram with the specified number of bins
    hist(x, breaks = bins, col = 'darkgray', border = 'white')
  })
})
```

# Shiny: ui.R

---

```
library(shiny)
# Define UI for application that draws a histogram
shinyUI(fluidPage(
  # Application title
  titlePanel("Hello Shiny!"),
  # Sidebar with a slider input for the number of bins
  sidebarLayout(
    sidebarPanel(
      sliderInput("bins",
                 "Number of bins:",
                 min = 1,
                 max = 50,
                 value = 30)
    ),
    # Show a plot of the generated distribution
    mainPanel(
      plotOutput("distPlot")
    )
  )))

```



# Creando HTML

The screenshot shows the RStudio interface. On the left, a file menu is open with the following options: R Script, R Markdown..., Shiny Web App..., Text File, C++ File, R Sweave, R HTML, R - Create a new R HTML document (which is highlighted), and R Documentation. The main workspace shows an R Markdown document titled '\_markdown\_example\_1.Rmd'. The code in the editor is:

```
12 summary(cars)
13 end.rcode-->
14
15 <p>You can also embed plots, for example:</p>
16
17 <!--begin.rcode fig.width=7, fig.height=6
```

At the top right, there are tabs for '\_markdown\_example\_1.Rmd\*', 'Untitled2\*', and 'Untitled3\*'. Below the tabs are two buttons: a magnifying glass icon for search and a blue circular icon with a white 'K' for Knit.

# Creando HTML

---

```
<html>

<head>
<title>Title</title>
</head>

<body>
```

<p>This is an R HTML document. When you click the <b>Knit HTML</b> button a web page will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:</p>

```
<!--begin.rcode
summary(cars)
end.rcode-->
```

<p>You can also embed plots, for example:</p>

```
<!--begin.rcode fig.width=7, fig.height=6
plot(cars)
end.rcode-->
```

```
</body>
</html>
```



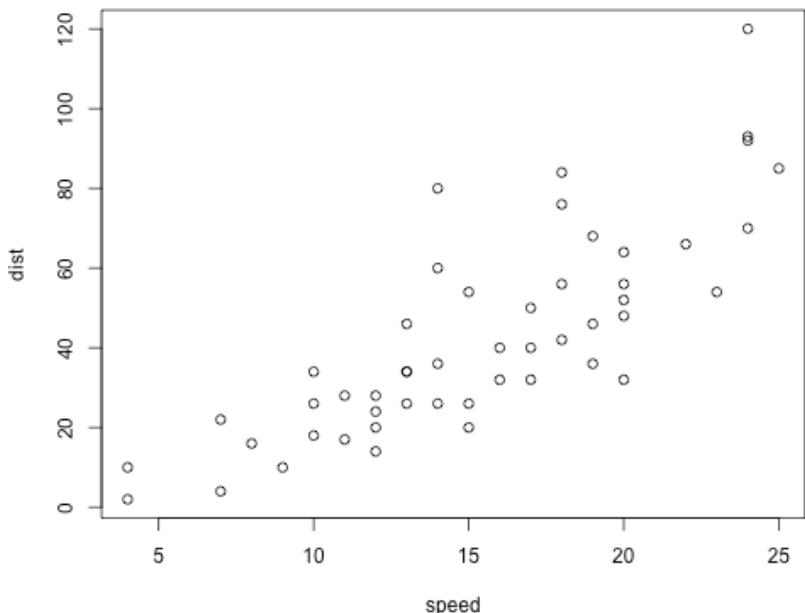
This is an R HTML document. When you click the **Knit HTML** button a web page will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
summary(cars)

##      speed          dist
##  Min.   :4.0   Min.   : 2.00
##  1st Qu.:12.0  1st Qu.:26.00
##  Median :15.0  Median :36.00
##  Mean    :15.4  Mean    :42.98
##  3rd Qu.:19.0  3rd Qu.:56.00
##  Max.   :25.0  Max.   :120.00
```

You can also embed plots, for example:

```
plot(cars)
```



# R presentation

```
002_R_presentation
```

---

```
author:
```

```
date:
```

```
autosize: true
```

First Slide

---

For more details on authoring R presentations please visit <<https://support.rstudio.com/hc/en-us/articles/200486468>>.

- Bullet 1
- Bullet 2
- Bullet 3

Slide With Code

---

```
```{r}
summary(cars)
```
```

Slide With Plot

---

```
```{r, echo=FALSE}
plot(cars)
```



# R presentation

Presentation

## Slide With Code

### First Slide

For more details or  
[us/articles/200486](https://us/articles/200486)

```
summary(cars)
```

	speed	dist
Min.	: 4.0	Min. : 2.00
1st Qu.	:12.0	1st Qu.: 26.00
Median	:15.0	Median : 36.00
Mean	:15.4	Mean : 42.98
3rd Qu.	:19.0	3rd Qu.: 56.30
Max.	:25.0	Max. :120.00

Max. Slide With Plot

- Bullet 1
- Bullet 2
- Bullet 3

