

1. Graficación en R
2. graphics
3. ggplot2
4. Live coding

## Graficación en R



Podemos crear graficas en R de dos distintas maneras:

1. Usando paquete **graphics** (precargado en R)

- Conveniente para gráficas sencillas
- Difícil de usar para gráficas más complicadas/personalizadas

2. Usando el paquete **ggplot2** de tidyverse

- Requiere un poco más de trabajo
- Podemos hacer gráficas más complicadas
- Fácil (cuando ya aprendimos bien) de personalizar

graphics



## Funciones más comunes y usadas

Function	Description
<code>plot(x)</code>	Plot of the values of $x$ (on the $y$ -axis) ordered on the $x$ -axis
<code>plot(x, y)</code>	Bivariate plot of $x$ (on the $x$ -axis) and $y$ (on the $y$ -axis)
<code>pie(x)</code>	Circular pie chart
<code>boxplot(x)</code>	“Box-and-whiskers” plot
<code>stripchart(x)</code>	Plot of the values of $x$ on a line (an alternative to <code>boxplot()</code> for small sample sizes)
<code>coplot(x~y z)</code>	Bivariate plot of $x$ and $y$ for each value (or interval of values) of $z$
<code>dotchart(x)</code>	If $x$ is a data frame, plots a Cleveland dot plot (stacked plots line-by-line and column-by-column)
<code>fourfoldplot(x)</code>	Visualizes, with quarters of circles, the association between two dichotomous variables for different populations ( $x$ must be an array with <code>dim=c(2, 2, k)</code> , or a matrix with <code>dim=c(2, 2)</code> if $k=1$ )
<code>assocplot(x)</code>	Cohen-Friendly graph showing the deviations from independence of rows and columns in a two dimensional contingency table
<code>mosaicplot(x)</code>	‘Mosaic’ graph of the residuals from a log-linear regression of a contingency table
<code>pairs(x)</code>	If $x$ is a matrix or a data frame, draws all possible bivariate plots between the columns of $x$
<code>hist(x)</code>	Histogram of the frequencies of $x$
<code>barplot(x)</code>	Histogram of the values of $x$
<code>qqnorm(x)</code>	Quantiles of $x$ with respect to the values expected under a normal law
<code>qqplot(x, y)</code>	Quantiles of $y$ with respect to the quantiles of $x$
<code>contour(x, y, z)</code>	Contour plot (data are interpolated to draw the curves), $x$ and $y$ must be vectors and $z$ must be a matrix so that <code>dim(z)=c(length(x), length(y))</code> ( $x$ and $y$ may be omitted)
<code>symbols(x, y, ...)</code>	Draws, at the coordinates given by $x$ and $y$ , symbols (circles, squares, rectangles, stars, thermometers or “boxplots”) which sizes, colors, etc, are specified by supplementary arguments
<code>termplot(mod.obj)</code>	Plot of the (partial) effects of a regression model ( <code>mod.obj</code> )

# Parámetros para personalizar funciones

Agregar título y nombre a los ejes

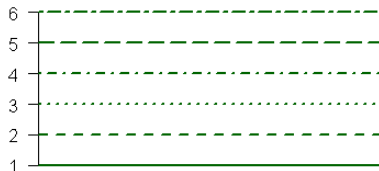
- `main` = "Título"
- `xlab` = "Nombre eje x"
- `ylab` = "Nombre eje y"

Personalizar

- `pch` = tipo de punto (número del 1 al 25)
- `lty` = tipo de línea (número del 1 al 6)
- `col` = "color"



**Line Types: lty=**



# R colors

coral3	deeppink4	gray17	gray19	gray99	lightpink1	mistyrose1	pink4	slategray1
coral2	deeppink2	gray16	gray18	gray98	lightpink2	mistyrose2	pink3	slategray2
coral	deeppink1	gray15	gray17	gray97	lightgray	mintcream	pink2	slateblue4
chocolate4	darkviolet4	gray14	gray16	gray96	lightgreen	mediumslateblue	pink1	slateblue3
chocolate3	darkviolet3	gray13	gray15	gray95	lightgoldenrod2	mediumslateblue	pink	slateblue1
chocolate1	darkviolet1	gray12	gray14	gray94	lightgoldenrod3	mediumslateblue	pink	slateblue1
chocolate	darkviolet	gray11	gray13	gray93	lightgoldenrod4	mediumslateblue	pink	slateblue1
chartreuse4	darkslategray4	gray10	gray12	gray92	lightgoldenrod	mediumslateblue	peachpuff4	skyblue4
chartreuse3	darkslategray3	gray9	gray11	gray91	lightgoldenrod	mediumslateblue	peachpuff3	skyblue3
chartreuse2	darkslategray2	gray8	gray10	gray90	lightgoldenrod	mediumslateblue	peachpuff2	skyblue2
chartreuse1	darkslategray1	gray7	gray9	gray89	lightgoldenrod	mediumslateblue	peachpuff1	skyblue1
chartreuse	darkslategray	gray6	gray8	gray88	lightcyan4	mediumpurple1	peachpuff	skyblue
cadetblue4	darkseagreen4	gray5	gray7	gray87	lightcyan3	mediumpurple2	peachpuff	skyblue
cadetblue3	darkseagreen3	gray4	gray6	gray86	lightcyan2	mediumpurple3	peachpuff	skyblue
cadetblue2	darkseagreen2	gray3	gray5	gray85	lightcyan1	mediumpurple4	peachpuff	skyblue
cadetblue1	darkseagreen1	gray2	gray4	gray84	lightcyan	mediumpurple5	peachpuff	skyblue
cadetblue	darkseagreen	gray1	gray3	gray83	lightcyan	mediumpurple6	peachpuff	skyblue
burlywood4	darkgoldenrod4	gray0	gray2	gray82	lightcyan	mediumpurple7	peachpuff	skyblue
burlywood3	darkgoldenrod3	gray0	gray1	gray81	lightcyan	mediumpurple8	peachpuff	skyblue
burlywood2	darkgoldenrod2	gray0	gray0	gray80	lightcyan	mediumpurple9	peachpuff	skyblue
burlywood1	darkgoldenrod1	gray0	gray0	gray79	lightcyan	mediumpurple10	peachpuff	skyblue
burlywood	darkgoldenrod	gray0	gray0	gray78	lightcyan	mediumpurple11	peachpuff	skyblue
brown4	darkorchid4	gray0	gray0	gray77	lightcyan	mediumpurple12	peachpuff	skyblue
brown3	darkorchid3	gray0	gray0	gray76	lightcyan	mediumpurple13	peachpuff	skyblue
brown2	darkorchid2	gray0	gray0	gray75	lightcyan	mediumpurple14	peachpuff	skyblue
brown1	darkorchid1	gray0	gray0	gray74	lightcyan	mediumpurple15	peachpuff	skyblue
brown	darkorchid	gray0	gray0	gray73	lightcyan	mediumpurple16	peachpuff	skyblue
brown	darkorange4	gray0	gray0	gray72	lightblue4	mediumorchid3	peachpuff	skyblue
blue4	darkorange3	gray0	gray0	gray71	lightblue3	mediumorchid2	peachpuff	skyblue
blue3	darkorange2	gray0	gray0	gray70	lightblue2	mediumorchid1	peachpuff	skyblue
blue2	darkorange1	gray0	gray0	gray69	lightblue1	mediumorchid	peachpuff	skyblue
blue1	darkorange	gray0	gray0	gray68	lightblue	mediumorchid	peachpuff	skyblue
blue	darkorange	gray0	gray0	gray67	lightblue	mediumorchid	peachpuff	skyblue
black4	darkgoldenrod4	gray0	gray0	gray66	lightblue	mediumorchid	peachpuff	skyblue
black3	darkgoldenrod3	gray0	gray0	gray65	lightblue	mediumorchid	peachpuff	skyblue
black2	darkgoldenrod2	gray0	gray0	gray64	lightblue	mediumorchid	peachpuff	skyblue
black1	darkgoldenrod1	gray0	gray0	gray63	lightblue	mediumorchid	peachpuff	skyblue
black	darkgoldenrod	gray0	gray0	gray62	lightblue	mediumorchid	peachpuff	skyblue
bisque4	darkgray4	gray0	gray0	gray61	lightblue	mediumorchid	peachpuff	skyblue
bisque3	darkgray3	gray0	gray0	gray60	lightblue	mediumorchid	peachpuff	skyblue
bisque2	darkgray2	gray0	gray0	gray59	lightblue	mediumorchid	peachpuff	skyblue
bisque1	darkgray1	gray0	gray0	gray58	lightblue	mediumorchid	peachpuff	skyblue
bisque	darkgray	gray0	gray0	gray57	lightblue	mediumorchid	peachpuff	skyblue
beige	darkgoldenrod4	gray0	gray0	gray56	lightblue	mediumorchid	peachpuff	skyblue
beige	darkgoldenrod3	gray0	gray0	gray55	lightblue	mediumorchid	peachpuff	skyblue
azure4	darkgoldenrod2	gray0	gray0	gray54	lightblue	mediumorchid	peachpuff	skyblue
azure3	darkgoldenrod1	gray0	gray0	gray53	lightblue	mediumorchid	peachpuff	skyblue
azure2	darkgoldenrod	gray0	gray0	gray52	lightblue	mediumorchid	peachpuff	skyblue
azure1	darkblue	gray0	gray0	gray51	lightblue	mediumorchid	peachpuff	skyblue
azure	darkblue	gray0	gray0	gray50	lightblue	mediumorchid	peachpuff	skyblue
aquamarine4	cyan4	gray0	gray0	gray49	lightblue	mediumorchid	peachpuff	skyblue
aquamarine3	cyan3	gray0	gray0	gray48	lightblue	mediumorchid	peachpuff	skyblue
aquamarine2	cyan2	gray0	gray0	gray47	lightblue	mediumorchid	peachpuff	skyblue
aquamarine1	cyan1	gray0	gray0	gray46	lightblue	mediumorchid	peachpuff	skyblue
aquamarine	cyan	gray0	gray0	gray45	lightblue	mediumorchid	peachpuff	skyblue
antiquewhite4	coral4	gray0	gray0	gray44	lightblue	mediumorchid	peachpuff	skyblue
antiquewhite3	coral3	gray0	gray0	gray43	lightblue	mediumorchid	peachpuff	skyblue
antiquewhite2	coral2	gray0	gray0	gray42	lightblue	mediumorchid	peachpuff	skyblue
antiquewhite1	coral1	gray0	gray0	gray41	lightblue	mediumorchid	peachpuff	skyblue
antiquewhite	coral	gray0	gray0	gray40	lightblue	mediumorchid	peachpuff	skyblue
aliceblue	coral	gray0	gray0	gray39	lightblue	mediumorchid	peachpuff	skyblue
white	coral	gray0	gray0	gray38	lightblue	mediumorchid	peachpuff	skyblue

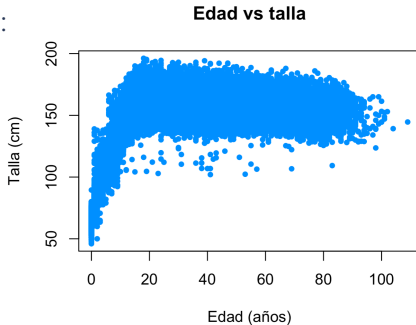
Nota: Podemos usar números, nombres o códigos hexadecimales

# Ejemplo

El código:

```
> plot(edad, talla,  
+      main = "Edad vs talla", xlab = "Edad (años)",  
+      ylab = "Talla (cm)", col = "dodgerblue",  
+      pch= 20)
```

Nos devuelve la gráfica:





ggplot2



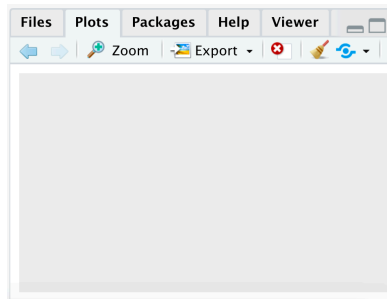
La idea principal es ir trabajando en capas:

1. Lienzo:

El código

```
> ggplot()
```

Nos devuelve

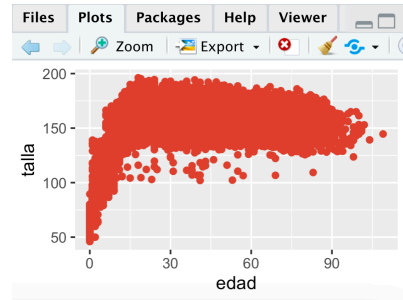


2. Agrego siguiente capa con un símbolo de +

El código

```
> ggplot() +  
+   geom_point(data = Antropometria,  
+             aes(x = edad, y = talla),  
+             color = "tomato3")  
_
```

Nos devuelve



# Template básico de una gráfica

En general, el template para ggplot siempre se ve así:

```
ggplot(data = <DATA>) +  
  <GEOM_FUNCTION>(mapping = aes(<MAPPINGS>))
```



En el ejemplo anterior, usamos la función *geom\_point*, pero podríamos usar por ejemplo líneas (*geom\_line*) o barras (*geom\_bar*)

Dentro de todas las (*geom\_functions*) debemos agregar la función (*aes()*) para indicar las variables que queremos graficar, y también las *aesthetics* que son propiedades visuales de los objetos en la gráfica. Estas propiedades incluyen cosas como el tamaño, la forma o el color de los puntos/lineas/barras etc.

En el ejemplo anterior:

```
> ggplot(data = Antropometria) +  
+   geom_point(aes(x = edad, y = talla),  
+               color = "tomato3")
```

Live coding

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- P. Kuhnert & B. Venables, An Introduction to R: Software for Statistical Modeling & Computing
- Grolemond, G., & Wickham, H. (2017). R for Data Science. O'Reilly Media.  
*<https://r4ds.had.co.nz/>*
- *<https://www.tidyverse.org/>*
- *<https://ggplot2.tidyverse.org/>*