

# R Markdown Sample

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```
# global chunk options
knitr::opts_chunk$set(echo = TRUE,
                      error=FALSE,
                      warning=FALSE,
                      message = FALSE)
```

## Getting started

To work with R Markdown:

- Install R
- Install the latest version of RStudio
- Install the latest version of the `knitr` package: `install.packages("knitr")`

To knit a PDF file, you need to install TeX.

- Easy way is to install the `tinytex` package by running the following lines:

```
install.packages("tinytex")
tinytex::install_tinytex()
```

- If you want full version of TeX: For Mac install MacTeX. For Windows install TeX Live.
- More info:
  - R Markdown Reference Guide
  - R Markdown Cheat Sheet

## Prepare for analyses

```
set.seed(1234)

#install.packages("tidyverse")
#install.packages("stargazer")
#install.packages("pander")

library(tidyverse)
library(stargazer)
library(pander)
```

Without specifying the options of chunk, you could get *warning* or package messages.

## Basic console output

To insert an R code chunk, you can type or insert it manually. You can also use the shortcut key (Windows: Ctrl + Alt + I; OS X: Cmd + Option + I). This will produce the following code chunk:

You can label a code chunk with a name (no space). Pressing tab when inside the braces will show code chunk options.

The following R code chunk is labelled `basic-df` and will be displayed as follows:

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

```
##      x      y
## 1     1 -0.21
## 2     2  2.28
## 3     3  4.08
## 4     4  1.65
## 5     5  5.43
## 6     6  6.51
## 7     7  6.43
## 8     8  7.45
## 9     9  8.44
## 10    10  9.11
```

## R Code chunk features

Frequently used chunk options:

Option	Description
include	If FALSE, knitr will run the code but prevent the code chunk AND results from appearing
echo	If FALSE, knitr will run the code, show the results but prevent the code chunk from appearing (useful for embedding figures or tables).
error	If FALSE, knitr will not display any error messages generated by the code.
message	If FALSE, knitr will not display any messages generated by the code.
warning	If FALSE, knitr will not display any warning messages generated by the code.

### Echo and Results

The following code hides the command input (i.e., `echo=FALSE`) but displays the table output.

```
##      x      y
## 1    1  0.52
## 2    2  1.00
## 3    3  2.22
## 4    4  4.06
## 5    5  5.96
## 6    6  5.89
## 7    7  6.49
## 8    8  7.09
## 9    9  8.16
## 10  10 12.42
```

You can also display a r object with *backtick* r object-name *backtick* : The first element of y is 0.52.

### Message and Warning

A code chunk without any specification of options show all warnings and messages which might be unnecessary for readers:

```
df |>
  summarize_at(vars(y), funs(mean))
```

```
##      y
## 1 5.381
```

This code does not output warnings:

```
df |>
  summarize_at(vars(y), funs(mean))
```

```
##      y
## 1 5.381
```

## Basic markdown functionality

### List items

Simple dot points:

- Point 1
- Point 2

- Point 3

and numeric dot points:

1. Number 1
2. Number 2
3. Number 3

and nested dot points:

- A
  - A.1
  - A.2
- B
  - B.1
  - B.2

## Tables

Manual tables can be included using the following notation:

A	B	C
1	Male	Purple
2	Female	Gold
3	Non-binary	White

For displaying `data.frame` as table, you can create prettier output by using `pander` or `kable` functions.

With `pander`:

Table 3: Fancy table from pander

x	y
1	0.52
2	1
3	2.22
4	4.06
5	5.96
6	5.89
7	6.49
8	7.09
9	8.16
10	12.42

With `kable`:

Table 4: Fancy table from kable

x	y
1	0.52
2	1.00
3	2.22
4	4.06

x	y
5	5.96
6	5.89
7	6.49
8	7.09
9	8.16
10	12.42

For regression tables, the default output is not very pretty:

```
mod1 <- y ~ x
res1 <- lm(formula = mod1, data = df)

mod2 <- y ~ x^2
res2 <- lm(formula = mod2, data = df)

summary(res1)

##
## Call:
## lm(formula = mod1, data = df)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1.2256 -0.5495 -0.1818  0.3684  1.8902
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  -0.9120     0.7070   -1.29    0.233
## x              1.1442     0.1139   10.04 8.23e-06 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.035 on 8 degrees of freedom
## Multiple R-squared:  0.9265, Adjusted R-squared:  0.9173
## F-statistic: 100.8 on 1 and 8 DF,  p-value: 8.232e-06

summary(res2)

##
## Call:
## lm(formula = mod2, data = df)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1.2256 -0.5495 -0.1818  0.3684  1.8902
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  -0.9120     0.7070   -1.29    0.233
## x              1.1442     0.1139   10.04 8.23e-06 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
```

```
## Residual standard error: 1.035 on 8 degrees of freedom
## Multiple R-squared:  0.9265, Adjusted R-squared:  0.9173
## F-statistic: 100.8 on 1 and 8 DF,  p-value: 8.232e-06
```

Use `stargazer` package to display format regression tables:

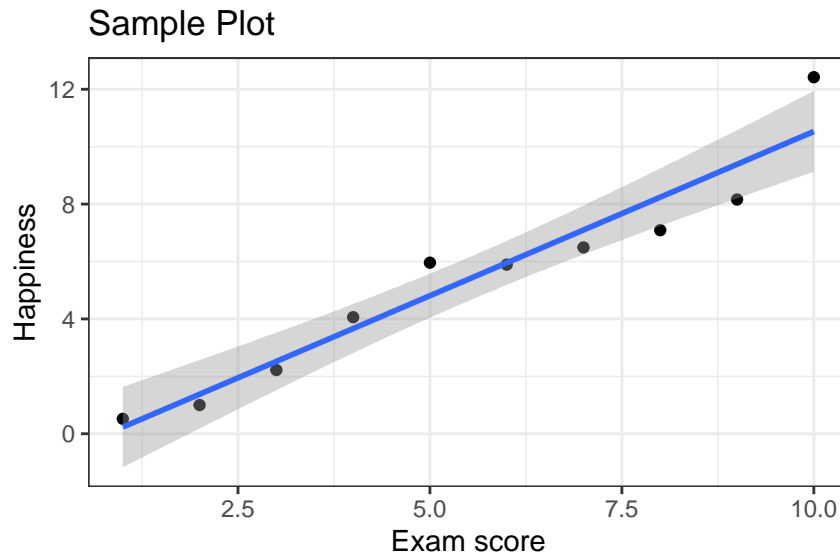
Table 5:

	<i>Dependent variable:</i>	
	<i>y</i>	
	(1)	(2)
x	1.144*** (0.114)	1.144*** (0.114)
Constant	−0.912 (0.707)	−0.912 (0.707)
Observations	10	10
R <sup>2</sup>	0.926	0.926
Adjusted R <sup>2</sup>	0.917	0.917
Residual Std. Error (df = 8)	1.035	1.035
F Statistic (df = 1; 8)	100.826***	100.826***
<i>Note:</i>	*p<0.1; **p<0.05; ***p<0.01	

More info: Cheat Sheet

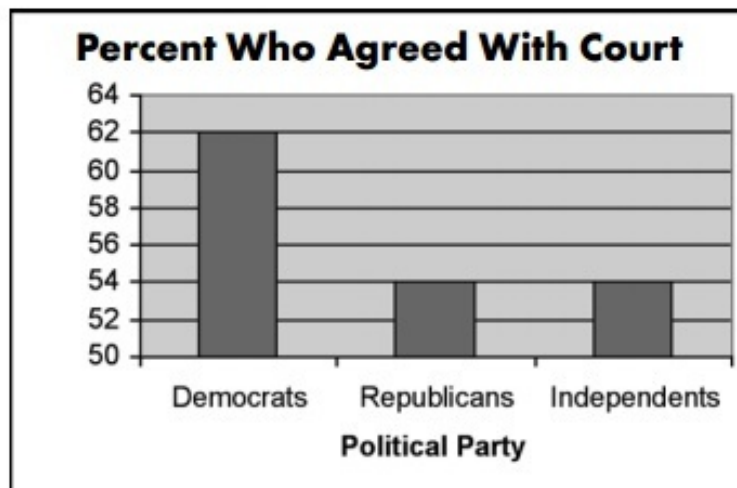
## Plots

You can also display plots from `ggplot2` or other graphic packages. Notice that in the code chunk options, I use the arguments `fig.align`, `fig.width`, and `fig.height` to customize the figure dimensions when knitting the document.



## Images

Images can be embedded using `knitr::include_graphics()`:



Source: Statistics How To “Misleading Graphs: Real Life Examples”

## Equations

Equations are included by using LaTeX notation and including them either between single dollar signs (inline equations) or double dollar signs (displayed equations). If you hang around the Q&A site CrossValidated you’ll be familiar with this idea.

There are inline equations such as  $y_i = \alpha + \beta x_i + e_i$ .

And displayed formulas:

$$y_i = \alpha + \beta_1 X_1$$

$$\frac{1}{1 + \exp(-x)}$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$\begin{aligned} X &= (x + a)(x - b) \\ &= x(x - b) + a(x - b) \\ &= x^2 + x(a - b) - ab \end{aligned}$$

More info: [LaTeX wiki](#)