

Project Management

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Creating projects in RStudio

File: New Project

OR

Project list (top right corner): New Project

Project structure

I recommend

- two folders in the root of your project directory: figures-tables and data
- ProjectName.Rmd file for data visualization and data analyses

Note! RStudio project files do not play well with *Box Drive*. They do work well with *Box Sync* and *OneDrive* (I have not tested dropbox).

Project tree structure

- MainProjectFolder/
 - data/
 - figures-tables/
 - ProjectName.Rmd
 - ProjectName.Rproj

Data - Practice dataset

1. Go to GitHub
2. Right click on “Raw”
3. “Save link as” to save it in project/data folder

Code files

Let's create a working file for your data visualization, figures, and data analysis.

Initial setup

1. Create Rmd file -> File:New File:R Markdown:PDF output
2. Erase body (everything below preamble)
3. Insert new R chunk (see +C "Insert" in the document top toolbar)
4. Paste the following code in the first chunk
5. Adjust chunk parameters

```
{r, message=FALSE, warning=FALSE, include=FALSE}
```

- message=FALSE # turn off all messages
- warning=FALSE # turn off all warnings
- include=FALSE # do not show output
- find more options by googling "rstudio chunk options"
- you can adjust these parameters by using gear icon on the top right of each code chunk.

Add project description using markdown (markdown cheat sheet can be found in RStudio under Help:Cheatsheets)

```
# My ground braking experiment
```

```
## Overview
```

```
This project investigates the effect of "x" on "y" in both male and female subjects.
```

Import and assess data

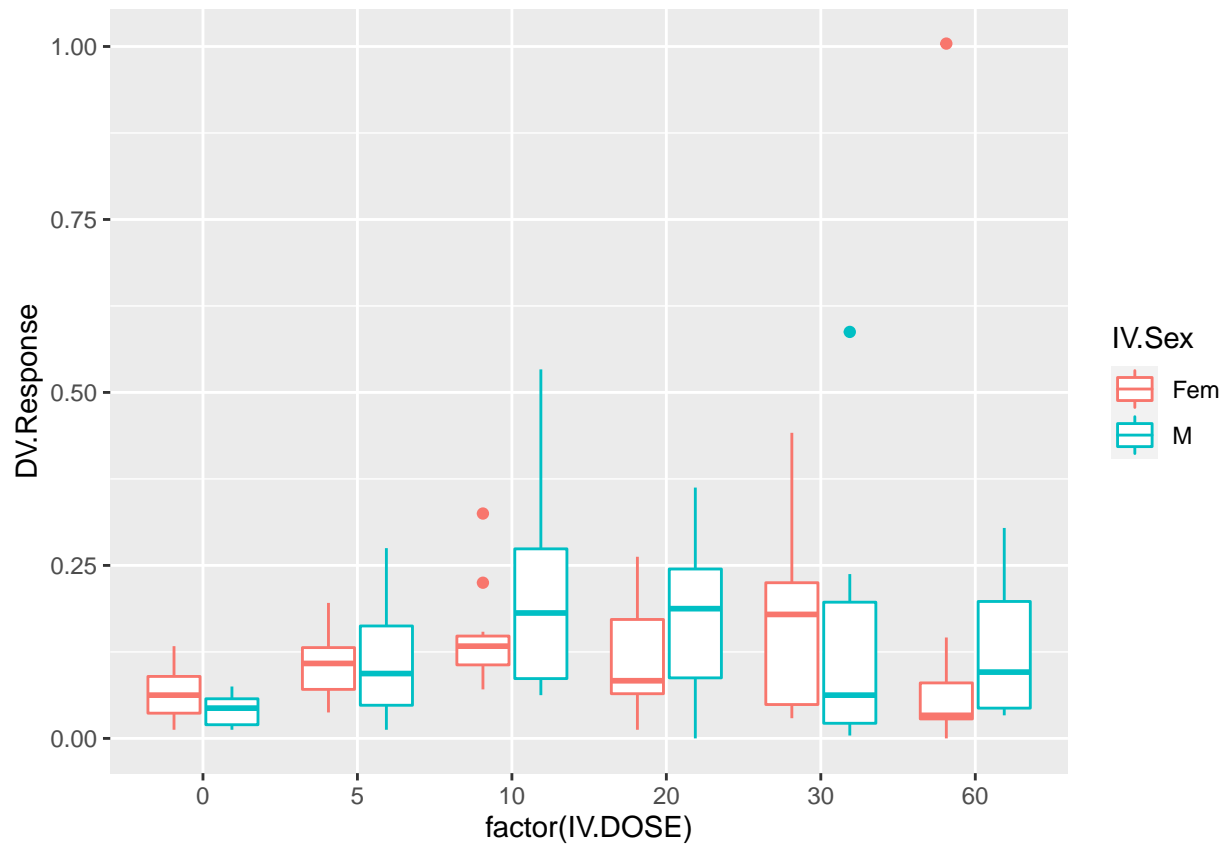
- Insert another R chunk with the following code

```
dataset <- read.csv("data/Sample-Dose-Effect-Curve.csv")
summary(dataset)
```

```
##      Subject      StartDate      Drug      IV.Sex
## Min.      :8640    Length:144    Length:144    Length:144
## 1st Qu.:8646    Class :character  Class :character  Class :character
## Median :8652    Mode  :character  Mode  :character  Mode  :character
## Mean      :8652
## 3rd Qu.:8657
## Max.      :8663
## DV.Activity      IV.DOSE      DV.Response
## Min.      : 0.0    Min.      : 0.00    Min.      :0.00000
## 1st Qu.: 82.0    1st Qu.: 5.00    1st Qu.:0.04167
## Median :112.5    Median :15.00    Median :0.08333
## Mean      :118.7    Mean      :20.83    Mean      :0.12674
## 3rd Qu.:152.2    3rd Qu.:30.00    3rd Qu.:0.18021
## Max.      :324.0    Max.      :60.00    Max.      :1.00417
```

- Insert a final chunk with heading `### Data visualization`

```
ggplot(dataset, aes(x = factor(IV.DOSE), y = DV.Response, colour=IV.Sex)) +  
  geom_boxplot()
```



- The plot is presented in a default ggplot configuration. This configuration is not often desirable for the publication.
- Let's adjust some parameters to make it a bit more publication friendly.

Convert variables to factors and rename

```
dataset <- read.csv("data/Sample-Dose-Effect-Curve.csv")  
dataset$Subject<-as.factor(dataset$Subject)  
dataset$Drug<-as.factor(dataset$Drug)  
dataset$Sex <-as.factor(dataset$IV.Sex )  
dataset$Dose <- factor(dataset$IV.DOSE, levels=c("0","5","10", "20", "30", "60"))  
summary(dataset)
```

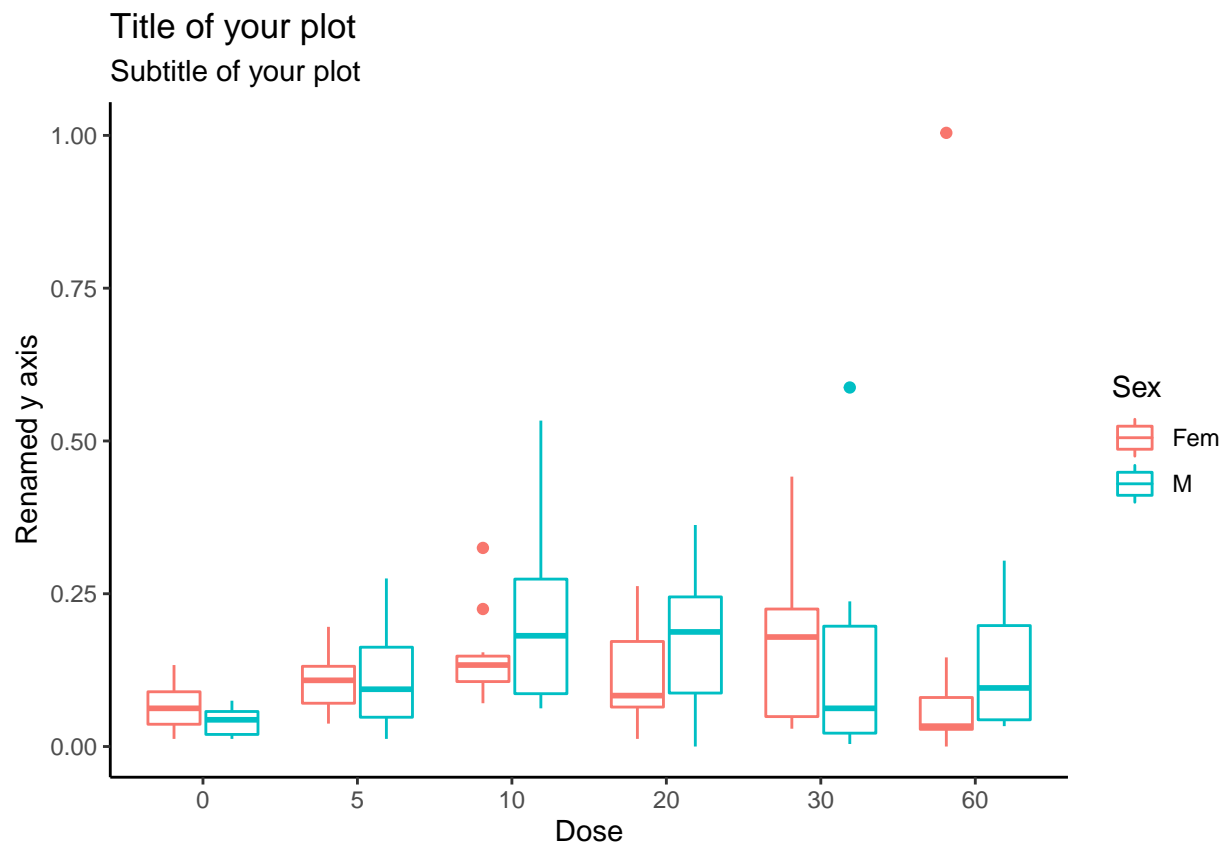
```
##      Subject      StartDate      Drug      IV.Sex      DV.Activity  
## 8640      : 6      Length:144      Bup:144      Length:144      Min.   : 0.0  
## 8641      : 6      Class :character      Class :character      1st Qu.: 82.0  
## 8642      : 6      Mode  :character      Mode  :character      Median :112.5  
## 8643      : 6  
## 8644      : 6  
## 8645      : 6  
## (Other):108      Mean   :118.7  
##      IV.DOSE      DV.Response      Sex      Dose      3rd Qu.:152.2  
##                                     Max.   :324.0
```

```
## Min.    : 0.00    Min.    :0.00000    Fem:72    0 :24
## 1st Qu.: 5.00    1st Qu.:0.04167    M  :72    5 :24
## Median :15.00    Median :0.08333                10:24
## Mean    :20.83    Mean    :0.12674                20:24
## 3rd Qu.:30.00    3rd Qu.:0.18021                30:24
## Max.    :60.00    Max.    :1.00417                60:24
##
```

See RStudio Help->Cheatsheets for more information about data transformations, manipulations, and vis

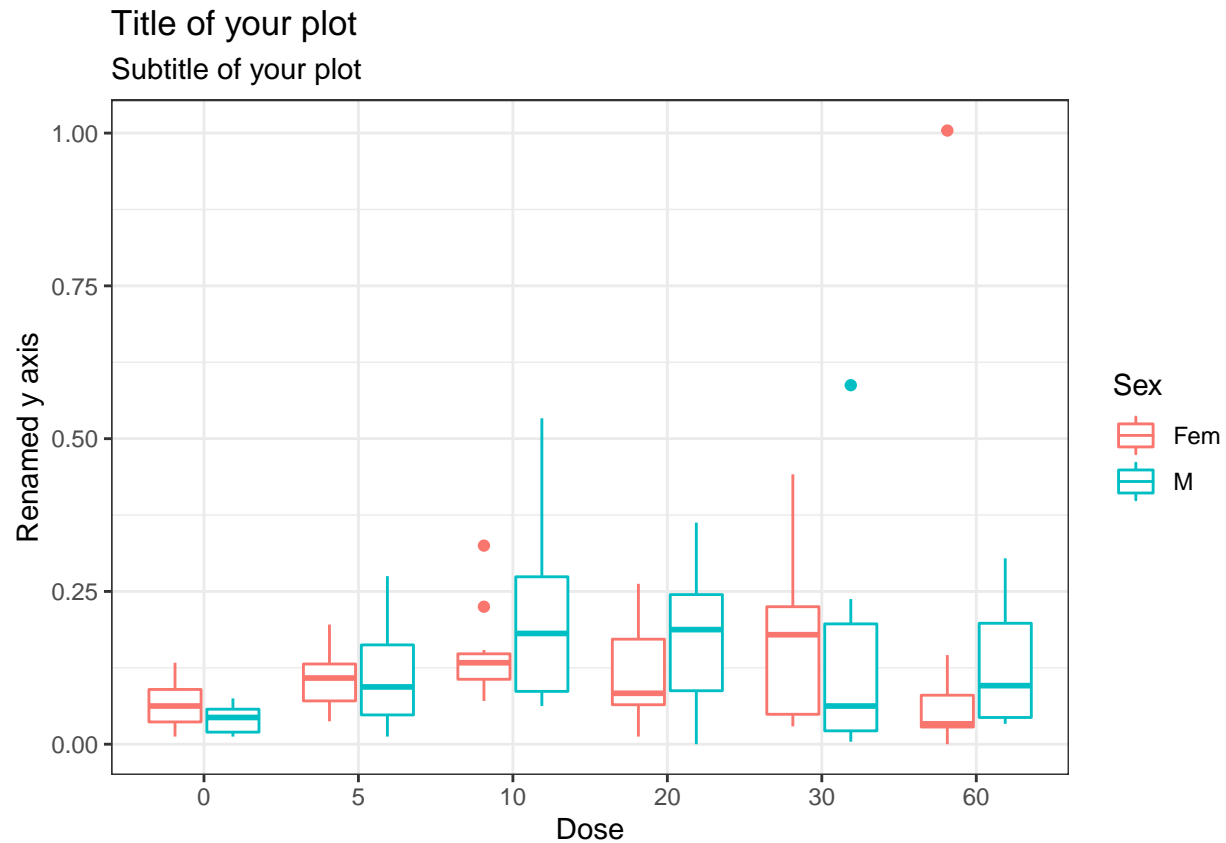
Classic theme

```
ggplot(dataset, aes(x = Dose, y = DV.Response, colour=Sex)) +
  geom_boxplot()+
  theme_classic()+
  labs(title = "Title of your plot", subtitle = "Subtitle of your plot", y="Renamed y axis")
```



bw theme

```
ggplot(dataset, aes(x = Dose, y = DV.Response, colour=Sex)) +
  geom_boxplot()+
  theme_bw()+
  labs(title = "Title of your plot", subtitle = "Subtitle of your plot", y="Renamed y axis")
```



For more information on different ggplot themes see

<https://ggplot2-book.org/polishing.html> <https://ggplot2.tidyverse.org/reference/ggtheme.html>

Create a PDF output

- Just click “Knit” on the document’s top toolbar.

Additional learning opportunity

- place your own dataset in the data folder
- create separate Rmd data visualization file with distinct name of your dataset
- within the Rmd file create code to summarize your data and visualize your data as you like or able.
- try different themes for your plot
- try different Titles for various elements in your plot
- output Rmd to PDF file using “Knit” function
- Troubleshoot if needed by googling your problem.
- Find more information here <https://ggplot2-book.org/>

Session details

```
devtools::session_info()
```

```
## - Session info -----
```

```

## setting value
## version R version 4.0.1 (2020-06-06)
## os Windows 10 x64
## system x86_64, mingw32
## ui RTerm
## language (EN)
## collate English_United States.1252
## ctype English_United States.1252
## tz America/New_York
## date 2020-06-30
##
## - Packages -----
## package * version date lib source
## assertthat 0.2.1 2019-03-21 [1] CRAN (R 4.0.0)
## backports 1.1.8 2020-06-17 [1] CRAN (R 4.0.1)
## callr 3.4.3 2020-03-28 [1] CRAN (R 4.0.0)
## cli 2.0.2 2020-02-28 [1] CRAN (R 4.0.0)
## colorspace 1.4-1 2019-03-18 [1] CRAN (R 4.0.0)
## crayon 1.3.4 2017-09-16 [1] CRAN (R 4.0.0)
## data.table 1.12.8 2019-12-09 [1] CRAN (R 4.0.0)
## desc 1.2.0 2018-05-01 [1] CRAN (R 4.0.0)
## devtools 2.3.0 2020-04-10 [1] CRAN (R 4.0.0)
## digest 0.6.25 2020-02-23 [1] CRAN (R 4.0.0)
## dplyr * 1.0.0 2020-05-29 [1] CRAN (R 4.0.0)
## ellipsis 0.3.1 2020-05-15 [1] CRAN (R 4.0.0)
## evaluate 0.14 2019-05-28 [1] CRAN (R 4.0.0)
## fansi 0.4.1 2020-01-08 [1] CRAN (R 4.0.0)
## farver 2.0.3 2020-01-16 [1] CRAN (R 4.0.0)
## fs 1.4.1 2020-04-04 [1] CRAN (R 4.0.0)
## generics 0.0.2 2018-11-29 [1] CRAN (R 4.0.0)
## ggplot2 * 3.3.2 2020-06-19 [1] CRAN (R 4.0.2)
## glue 1.4.1 2020-05-13 [1] CRAN (R 4.0.0)
## gridExtra * 2.3 2017-09-09 [1] CRAN (R 4.0.0)
## gtable 0.3.0 2019-03-25 [1] CRAN (R 4.0.0)
## htmltools 0.5.0 2020-06-16 [1] CRAN (R 4.0.0)
## htmlwidgets 1.5.1 2019-10-08 [1] CRAN (R 4.0.0)
## httr 1.4.1 2019-08-05 [1] CRAN (R 4.0.0)
## jsonlite 1.6.1 2020-02-02 [1] CRAN (R 4.0.0)
## knitr 1.28 2020-02-06 [1] CRAN (R 4.0.0)
## labeling 0.3 2014-08-23 [1] CRAN (R 4.0.0)
## lattice * 0.20-41 2020-04-02 [2] CRAN (R 4.0.1)
## lazyeval 0.2.2 2019-03-15 [1] CRAN (R 4.0.0)
## lifecycle 0.2.0 2020-03-06 [1] CRAN (R 4.0.0)
## magrittr 1.5 2014-11-22 [1] CRAN (R 4.0.0)
## memoise 1.1.0 2017-04-21 [1] CRAN (R 4.0.0)
## munsell 0.5.0 2018-06-12 [1] CRAN (R 4.0.0)
## nlme * 3.1-148 2020-05-24 [2] CRAN (R 4.0.1)
## pillar 1.4.4 2020-05-05 [1] CRAN (R 4.0.0)
## pkgbuild 1.0.8 2020-05-07 [1] CRAN (R 4.0.0)
## pkgconfig 2.0.3 2019-09-22 [1] CRAN (R 4.0.0)
## pkgload 1.1.0 2020-05-29 [1] CRAN (R 4.0.0)
## plotly * 4.9.2.1 2020-04-04 [1] CRAN (R 4.0.2)
## plyr * 1.8.6 2020-03-03 [1] CRAN (R 4.0.0)
## prettyunits 1.1.1 2020-01-24 [1] CRAN (R 4.0.0)

```

```

## processx      3.4.2    2020-02-09 [1] CRAN (R 4.0.0)
## ps            1.3.3    2020-05-08 [1] CRAN (R 4.0.0)
## purrr         0.3.4    2020-04-17 [1] CRAN (R 4.0.0)
## R6            2.4.1    2019-11-12 [1] CRAN (R 4.0.0)
## RColorBrewer * 1.1-2    2014-12-07 [1] CRAN (R 4.0.0)
## Rcpp          1.0.4.6  2020-04-09 [1] CRAN (R 4.0.0)
## remotes       2.1.1    2020-02-15 [1] CRAN (R 4.0.0)
## rlang         0.4.6    2020-05-02 [1] CRAN (R 4.0.0)
## rmarkdown     2.3      2020-06-18 [1] CRAN (R 4.0.0)
## Rmisc         * 1.5      2013-10-22 [1] CRAN (R 4.0.0)
## rprojroot     1.3-2    2018-01-03 [1] CRAN (R 4.0.0)
## scales        1.1.1    2020-05-11 [1] CRAN (R 4.0.0)
## sessioninfo   1.1.1    2018-11-05 [1] CRAN (R 4.0.0)
## stringi       1.4.6    2020-02-17 [1] CRAN (R 4.0.0)
## stringr       1.4.0    2019-02-10 [1] CRAN (R 4.0.0)
## testthat      2.3.2    2020-03-02 [1] CRAN (R 4.0.0)
## tibble        3.0.1    2020-04-20 [1] CRAN (R 4.0.0)
## tidyr         * 1.1.0    2020-05-20 [1] CRAN (R 4.0.0)
## tidyselect    1.1.0    2020-05-11 [1] CRAN (R 4.0.0)
## usethis       1.6.1    2020-04-29 [1] CRAN (R 4.0.0)
## vctrs         0.3.1    2020-06-05 [1] CRAN (R 4.0.0)
## viridisLite   0.3.0    2018-02-01 [1] CRAN (R 4.0.0)
## withr         2.2.0    2020-04-20 [1] CRAN (R 4.0.0)
## xfun          0.15     2020-06-21 [1] CRAN (R 4.0.1)
## yaml          2.2.1    2020-02-01 [1] CRAN (R 4.0.0)
##
## [1] C:/Users/sc1109/Documents/R/win-library/4.0
## [2] C:/Program Files/R/R-4.0.1/library

```

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