prova

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Contents

Chapter 1

About

This is a *sample* book written in **Markdown**. You can use anything that Pandoc's Markdown supports; for example, a math equation $a^2 + b^2 = c^2$.

1.1 Usage

Each **bookdown** chapter is an .Rmd file, and each .Rmd file can contain one (and only one) chapter. A chapter *must* start with a first-level heading: `# A good chapter`, and can contain one (and only one) first-level heading.

Use second-level and higher headings within chapters like: `## A short section` or `### An even shorter section`.

The `index.Rmd` file is required, and is also your first book chapter. It will be the homepage when you render the book.

1.2 Render book

You can render the HTML version of this example book without changing anything:

1. Find the **Build** pane in the RStudio IDE, and
2. Click on **Build Book**, then select your output format, or select "All formats" if you'd like to use multiple formats from the same book source files.

Or build the book from the R console:

```
bookdown::render_book()
```

To render this example to PDF as a `bookdown::pdf_book`, you'll need to install XeLaTeX. You are recommended to install TinyTeX (which includes XeLaTeX): https://yihui.org/tinytex/.

1.3 Preview book

As you work, you may start a local server to live preview this HTML book. This preview will update as you edit the book when you save individual .Rmd files. You can start the server in a work session by using the RStudio add-in "Preview book", or from the R console:

```
bookdown::serve_book()
```

Chapter 2

Visualització i depurat de dades

Disposem de dos bases de dades, una sobre ecocardiogrames i altre sobre densitometries en esportistes. Anem a fer el preprocessat de dades en ambdues.

2.1 Ecocardiograma

Carreguem les dades i les visualitzem. Passem les columnes Temporada, Secció, Equip i Prova a factor i canviem el nom de les altres variables per treballar-hi millor:

```
dfpreeco <- ecocardiograma%>%
  mutate(
    Temporada = as.factor(Temporada),
    `Secció` = as.factor(`Secció`),
    Equip = as.factor(Equip),
    `Id Persona` = as.factor(`Id Persona`),
    Sexe = as.factor(Sexe),
    Prova = as.factor(Prova),
    `Data Prova` = `Data Prova`,
    Any =  year(ecocardiograma$`Data Prova`)
    ) %>% dplyr::rename(
    Seccio =`Secció`,
    Id = `Id Persona`,
    Data_eco = `Data Prova`,
    Diam_ven_esq_diast = `Diam. ventricle esq. Diast.`,
    Diam_ven_esq_sist = `Diam. ventricle esq. Sist.`,
```

```
    Gruix_tabic = `Gruix tabic interventricular`,
    Gruix_paret = `Gruix paret posterior V.E.`,
    Auricula_esq = `Aurícula esq.`,
    Diam_aorta = `Diam. arrel aorta`,

    Diam_ven_esq_i = `Diam. ventricle esq. Diast.(i)`,
    Diam_ven_esq_sist_i = `Diam. ventricle esq. Sist.(i)`,
    Gruix_tabic_i = `Gruix tabic interventricul.(i)`,
    Gruix_paret_i = `Gruix paret posterior V.E.(i)`,
    Auricula_esq_i = `Aurícula esq.(i)`,
    Diam_aorta_i = `Diam. arrel aorta(i)`
  ) %>% dplyr::select(-c(Temporada, Naixament))
```

Eliminem aquelles files on totes les columnes de proves son NA's i no ens aporten informació.

```
dfpreeco <- dfpreeco %>%
  filter(!(rowSums(is.na(dplyr::select(., -c(Seccio, Equip, Id, Sexe, Edat, Prova, Data
```

Ara comparem que no hi haguin proves repetides, és a dir, que per la mateixa persona i mateixa data tinguem dos valors:

```
rep<- dfpreeco %>%
  group_by(Id, Data_eco) %>%
  tally() %>%
  filter(n>1) %>%
  left_join(dfpreeco, by = c("Id", "Data_eco"))

dfpreeco <- dfpreeco %>% distinct(Id, Data_eco, .keep_all = TRUE)
```

Hi han missings en columnes que poden no ser de veritat. És a dir, que la informació s'entrés en alguna altra fila. Concretament en les columnes Seccio, Equip i Edat. Anem a imputar els possibles:

```
dfpreeco <- dfpreeco %>%
  group_by(Id) %>%
  fill(Seccio, .direction = "updown")  %>%
  fill(Equip, .direction = "updown")
```

```
dfpreeco <- dfpreeco %>%
  mutate(Seccio = case_when(
    Seccio == "FUTBOL FEMENÍ" ~ "FUTBOL",
    Seccio == "VOLEIBOL FEMENÍ" ~ "VOLEIBOL",
```

```
    Seccio == "BÀSQUET FEMENÍ" ~ "BÀSQUET",
    TRUE ~ Seccio
  ))

unique(dfpreeco$Seccio)
```

```
 [1] "ATLETISME"          "BÀSQUET"            "FUTBOL"
 [4] "FUTBOL SALA"        "HANDBOL"            "HOQUEI GEL"
 [7] "HOQUEI HERBA"       "HOQUEI PATINS"      "PATINATGE ARTÍSTIC"
[10] "RUGBI"              "VOLEIBOL"           NA
[13] "BÀSQUET CR"
```

2.2 Densitometria

Repetim tot el procés per l'altre base de dades

```
dfpredensi <- densitometria%>%
  mutate(
    Secció = as.factor(Secció),
    `Id Persona`= as.factor(`Id Persona`),
    Sexe = as.factor(Sexe),
    Prova = as.factor(Prova),
    Any  = year(densitometria$`Data Prova`))%>%
  rename_at(vars(starts_with("Densito - CC - ")), ~ gsub("[ .-]", "", .x)) %>%
  rename_at(vars(starts_with("DensitoCC")), ~ .x %>% str_replace("DensitoCC", "")) %>%
  rename_at(vars(starts_with("Densito - CMG - ")), ~ gsub("[ .-]", "", .x)) %>%
  rename_at(vars(starts_with("DensitoCMG")), ~ .x %>% str_replace("DensitoCMG", "")) %>%
  rename_at(vars(ends_with("(%Grasa)")), ~ gsub("\\(.*\\)", "_percentatge", .x)) %>%
  rename_at(vars(ends_with("(g)")), ~ gsub("\\(.*\\)", "_g", .x)) %>%
  rename_at(vars(ends_with("(kg)")), ~ gsub("\\(.*\\)", "_kfg", .x)) %>%
    dplyr::rename(
    Id = `Id Persona`,
    Data_densi = `Data Prova`,
    Seccio = `Secció`,
    Tronco_total = `Tronco/Total`,
    Piernas_total = `Piernas/Total`,
    Brazos_Piernas_total = `(Brazos+Piernas)/Tronco`) %>%
  dplyr::select(-c(Temporada))
```

Dades repetides:

```
rep <- dfpredensi %>%
  group_by(Id, Data_densi) %>%
  tally() %>%
  filter(n>1) %>%
  left_join(dfpredensi, by = c("Id", "Data_densi"))

dfpredensi <- dfpredensi %>% distinct(Id, Data_densi, .keep_all = TRUE)
```

Filas con columnas de proves NA's:

```
dfpredensi <- dfpredensi %>%
  filter(!(rowSums(is.na(dplyr::select(., -c(Seccio, Id, Edat, Prova, Sexe,  Data_densi
```

Imputamos variable Secció:

```
dfpredensi <- dfpredensi %>%
  group_by(Id) %>%
  fill(Seccio, .direction = "updown")
```

Buscar coincidencias de IDs entre els dos DataFrames per completar la columna Secció.

```
#Id sense Secció en df desitometria
id_na_seccio <- dfpredensi%>%
  group_by(Id) %>%
  filter(all(is.na(Seccio))) %>%
  distinct(Id, Seccio)

# Id amb algun no.na en Secció en df ecocardiogramas
id_seccio <- dfpreeco %>%
  group_by(Id) %>%
  filter(!is.na(Seccio)) %>%
  distinct(Id, Seccio) %>%
  ungroup()

#Id que podrem imputar en el dataframe dfpredesi:
id_seccio_densi <- inner_join(id_seccio, id_na_seccio, by = "Id") %>%
  dplyr::select(-Seccio.y) %>%
  dplyr::rename(Seccio = Seccio.x)
```

I de la mateixa forma mirem els que podrem imputar en ecocardiograma:

```
#Id sense Secció en df ecocardiogramas
id_na_seccio <- dfpreeco%>%
  group_by(Id) %>%
  filter(all(is.na(Seccio))) %>%
  distinct(Id, Seccio)

# Id amb algun no.na en Secció en df desitometries
id_seccio <- dfpredensi %>%
  group_by(Id) %>%
  filter(!is.na(Seccio)) %>%
  distinct(Id, Seccio) %>%
  ungroup()

#Id que podrem imputar en el dataframe dfpreeco:
id_seccio_eco <- inner_join(id_seccio, id_na_seccio, by = "Id") %>%
  dplyr::select(-Seccio.y) %>%
  dplyr::rename(Seccio = Seccio.x)
```

Imputem els valors:

```
dfpreeco <- left_join(dfpreeco, id_seccio_eco, by = "Id") %>%
                dplyr::rename(Seccio = Seccio.x)%>%
                mutate(
                    Seccio = case_when(
                      is.na(Seccio) ~ Seccio.y,
                      TRUE ~ Seccio))%>%
                dplyr::select(-Seccio.y)%>%
                group_by(Id) %>%
                fill(Seccio, .direction = "updown")  %>%
                ungroup()

dfpredensi <- left_join(dfpredensi, id_seccio_densi, by = "Id") %>%
                dplyr::rename(Seccio = Seccio.x)%>%
                mutate(
                    Seccio = case_when(
                      is.na(Seccio) ~ Seccio.y,
                      TRUE ~ Seccio)) %>%
                dplyr::select(-Seccio.y) %>%
                group_by(Id) %>%
                fill(Seccio, .direction = "updown")  %>%
                ungroup()
```

```
dfpredensi <- dfpredensi %>%
  mutate(Seccio = case_when(
    Seccio == "FUTBOL FEMENÍ" ~ "FUTBOL",
```

```
    Seccio == "VOLEIBOL FEMENÍ" ~ "VOLEIBOL",
    Seccio == "BÀSQUET FEMENÍ" ~ "BÀSQUET",
    TRUE ~ Seccio
  ))

unique(dfpredensi$Seccio)
```

```
 [1] "ATLETISME"          "BÀSQUET"            "FUTBOL"
 [4] "FUTBOL SALA"        "HANDBOL"            "HOQUEI GEL"
 [7] "HOQUEI HERBA"       "HOQUEI PATINS"      "PATINATGE ARTÍSTIC"
[10] "RUGBI"              "VOLEIBOL"           NA
[13] "BÀSQUET CR"
```

```
glimpse(dplyr::select(dfpreeco, 1:8))
```

```
Rows: 6,383
Columns: 8
$ Seccio   <chr> "ATLETISME", "ATLETISME", "ATLETISME", "ATLETISME", "ATLETISM~
$ Equip    <fct> Sènior masculí, Sènior femení, Sènior femení, Sènior femení, ~
$ Id       <fct> 124810, 104346937, 8772507, 12991158, 104351814, 104347466, 1~
$ Sexe     <fct> M, F, F, F, F, F, F, F, F, F, M, M, F, F, M, M, F, M, M, F, F~
$ Edat     <dbl> 38.41, 14.79, 19.04, 19.05, 32.12, 16.88, 19.57, 18.69, 17.59~
$ Prova    <fct> Ecocardiograma, Ecocardiograma, Ecocardiograma, Ecocardiogram~
$ Data_eco <dttm> 2014-10-16 12:15:00, 2014-10-16 16:15:00, 2014-10-02 11:30:0~
$ Pes      <dbl> 88, 157, 61, 63, 61, 49, 57, 48, 67, 53, 67, 72, 66, 49, 60, ~
```

```
glimpse(dplyr::select(dfpredensi, 1:8))
```

```
Rows: 6,382
Columns: 8
$ Seccio                      <chr> "ATLETISME", "ATLETISME", "ATLETISME", "ATL~
$ Id                          <fct> 1193801, 105274175, 1452702, 15073064, 1052~
$ Sexe                        <fct> M, M, M, F, M, F, F, F, M, M, M, M, M, M, M~
$ Edat                        <dbl> 20.07, 23.52, 17.63, 18.64, 18.64, 29.99, 2~
$ Prova                       <fct> Densitometria, Densitometria, Densitometria~
$ Data_densi                  <dttm> 2015-04-24 19:00:00, 2015-07-23 10:00:00, ~
$ BrazoIzqTejido_percentatge <dbl> 14.1, 10.4, 10.7, 21.9, 14.9, 19.9, 27.1, 2~
$ BrazoIzqRegión_percentatge <dbl> 13.3, 9.8, 10.1, 20.7, 14.1, 18.6, 25.7, 21~
```

Chapter 3

Cross-references

Cross-references make it easier for your readers to find and link to elements in your book.

3.1 Chapters and sub-chapters

There are two steps to cross-reference any heading:

1. Label the heading: `# Hello world {#nice-label}`.
    - Leave the label off if you like the automated heading generated based on your heading title: for example, `# Hello world` = `# Hello world {#hello-world}`.
    - To label an un-numbered heading, use: `# Hello world {-#nice-label}` or `{# Hello world .unnumbered}`.
2. Next, reference the labeled heading anywhere in the text using `\@ref(nice-label)`; for example, please see Chapter 3.
    - If you prefer text as the link instead of a numbered reference use: any text you want can go here.

3.2 Captioned figures and tables

Figures and tables *with captions* can also be cross-referenced from elsewhere in your book using `\@ref(fig:chunk-label)` and `\@ref(tab:chunk-label)`, respectively.

See Figure 3.1.

```
par(mar = c(4, 4, .1, .1))
plot(pressure, type = 'b', pch = 19)
```

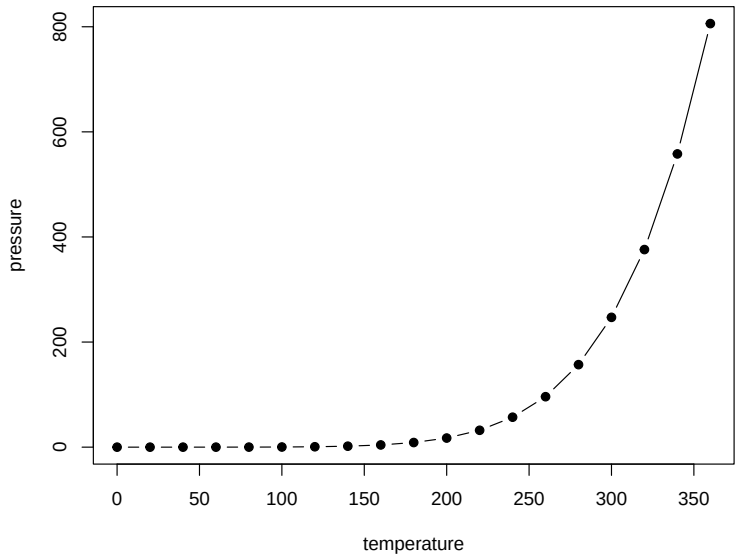

Figure 3.1: Here is a nice figure!

Don't miss Table 3.1.

```
knitr::kable(
  head(pressure, 10), caption = 'Here is a nice table!',
  booktabs = TRUE
)
```

Table 3.1: Here is a nice table!

temperature	pressure
0	0.0002
20	0.0012
40	0.0060
60	0.0300
80	0.0900
100	0.2700
120	0.7500
140	1.8500
160	4.2000
180	8.8000

Chapter 4

Parts

You can add parts to organize one or more book chapters together. Parts can be inserted at the top of an .Rmd file, before the first-level chapter heading in that same file.

Add a numbered part: `# (PART) Act one {-}` (followed by `# A chapter`)

Add an unnumbered part: `# (PART\*) Act one {-}` (followed by `# A chapter`)

Add an appendix as a special kind of un-numbered part: `# (APPENDIX) Other stuff {-}` (followed by `# A chapter`). Chapters in an appendix are prepended with letters instead of numbers.

Chapter 5

Footnotes and citations

5.1 Footnotes

Footnotes are put inside the square brackets after a caret `^[]`. Like this one [1].

5.2 Citations

Reference items in your bibliography file(s) using `@key`.

For example, we are using the **bookdown** package [Xie, 2023] (check out the last code chunk in index.Rmd to see how this citation key was added) in this sample book, which was built on top of R Markdown and **knitr** [Xie, 2015] (this citation was added manually in an external file book.bib). Note that the `.bib` files need to be listed in the index.Rmd with the YAML `bibliography` key.

The RStudio Visual Markdown Editor can also make it easier to insert citations: https://rstudio.github.io/visual-markdown-editing/#/citations

[1] This is a footnote.

Chapter 6

Blocks

6.1 Equations

Here is an equation.

$$f(k) = \binom{n}{k} p^k (1-p)^{n-k} \tag{6.1}$$

You may refer to using `\@ref(eq:binom)`, like see Equation (6.1).

6.2 Theorems and proofs

Labeled theorems can be referenced in text using `\@ref(thm:tri)`, for example, check out this smart theorem 6.1.

Theorem 6.1. *For a right triangle, if c denotes the* length *of the hypotenuse and a and b denote the lengths of the* ***other*** *two sides, we have*

$$a^2 + b^2 = c^2$$

Read more here https://bookdown.org/yihui/bookdown/markdown-extensions-by-bookdown.html.

6.3 Callout blocks

The R Markdown Cookbook provides more help on how to use custom blocks to design your own callouts: https://bookdown.org/yihui/rmarkdown-cookbook/custom-blocks.html

Chapter 7

Sharing your book

7.1 Publishing

HTML books can be published online, see: https://bookdown.org/yihui/bookdown/publishing.html

7.2 404 pages

By default, users will be directed to a 404 page if they try to access a webpage that cannot be found. If you'd like to customize your 404 page instead of using the default, you may add either a `_404.Rmd` or `_404.md` file to your project root and use code and/or Markdown syntax.

7.3 Metadata for sharing

Bookdown HTML books will provide HTML metadata for social sharing on platforms like Twitter, Facebook, and LinkedIn, using information you provide in the `index.Rmd` YAML. To setup, set the `url` for your book and the path to your `cover-image` file. Your book's `title` and `description` are also used.

This `gitbook` uses the same social sharing data across all chapters in your book- all links shared will look the same.

Specify your book's source repository on GitHub using the `edit` key under the configuration options in the `_output.yml` file, which allows users to suggest an edit by linking to a chapter's source file.

Read more about the features of this output format here:

https://pkgs.rstudio.com/bookdown/reference/gitbook.html

Or use:

```
?bookdown::gitbook
```

Bibliography

Yihui Xie. *Dynamic Documents with R and knitr*. Chapman and Hall/CRC, Boca Raton, Florida, 2nd edition, 2015. URL http://yihui.org/knitr/. ISBN 978-1498716963.

Yihui Xie. *bookdown: Authoring Books and Technical Documents with R Markdown*, 2023. URL https://github.com/rstudio/bookdown. R package version 0.37, https://pkgs.rstudio.com/bookdown/.