Document title

Subtitle

Author name(s)
October 15, 2021

Abstract

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Aenean ut elit odio. Donec fermentum tellus neque, vitae fringilla orci pretium vitae. Fusce maximus finibus facilisis. Donec ut ullamcorper turpis. Donec ut porta ipsum. Nullam cursus mauris a sapien ornare pulvinar. Aenean malesuada molestie erat quis mattis. Praesent scelerisque posuere faucibus. Praesent nunc nulla, ullamcorper ut ullamcorper sed, molestie ut est. Donec consequat libero nisi, non semper velit vulputate et. Quisque eleifend tincidunt ligula, bibendum finibus massa cursus eget. Curabitur aliquet vehicula quam non pulvinar. Aliquam facilisis tortor nec purus finibus, sit amet elementum eros sodales. Ut porta porttitor vestibulum.

1 Introduction

Configure the YAML header including the following elements:

- `title`: Title
- `subtitle`: Subitle; remove option completely, if you don't need a subtitle.
- `author`: Character of single or multiple author(s)
- `header_left`: A running title as left header; remove option to leave blank.
- `header_right`: A second right header (e.g. authors); remove option to leave blank.
- `date`: The date; by default `\date`, will populate the date automatically.
- `fontsize`: Font size for body text; choose between `10pt`, `11pt` (default), and `12pt`.
- `linkcolor`, `filecolor`, `citecolor`, `urlcolor`: Specify here colors for internal links, external links, citation links, and linked URLs, respectively, if you don't want the default colors; use options allowed by xcolor, including the dvipsnames, svgnames, and x11names lists.
- `german`: If option is set to `true`, the table and figure caption as well as the abstract and reference header will be in German; default is `false` (i.e., English).
- `bibliography`: A path to the bibliography file to use for references (BibTeX *.bib* file). This template uses the bibliography-related package natbib. The current file includes 3 dummy references; either insert your references into this file or replace the file with your own.
- `bibliographystyle`: The style is provided in the bibstyle.bst file, which adopts the SAGE Harvard reference style. Just leave the file as it is.
- `abstract`: Write here your abstract or remove option if you don't want to include an abstract.
- `output`: The nested fields for the output field are based on the arguments of the output function. Since `UHHformats::pdf_simple` is based on `rmarkdown::pdf_document`, see its help page for more options. Current default settings are
  - `highlight = "kate"`
  - `citation_package = "natbib"`
  - `number_sections = TRUE`
  - `latex_engine = "xelatex"`
- `header_includes`: Here you can add additional LaTeXcode to include in the header, before the `\\begin\{document\}` statement.
- If you want to add additional LaTeX code to include before the `\\end\{document\}` statement use the field `include_after`.

2 Methods

2.1 R Markdown syntax vs LaTeXsyntax

As with any .Rmd file you can write the entire report in the R Markdown syntax. However, if you are familiar with LaTeXyou can also mix both:

2.1.1 R Markdown subsection

This is a dummy text to show you how to write in **bold** and in *italics*.

2.1.2 LaTeX subsection

This is a dummy text to show you that you can also write in **bold** and in *italics* with LaTeX.

2.2 Cross-referencing within the report

To cross-references figures or tables you have to have a:

- **caption to your figure (or table)**:
  - NOTE: figures without a caption will be included directly as images and will therefore not be a numbered figure
- **labeled code chunk**: this provides the identifier for referencing the figure or table generated by the chunk.

Cross-references within the text can then be made using the standard LaTeXsyntax `\@ref{type:label}`, where label is the chunk label and type is the environment being referenced (e.g. tab, fig, or eq). Examples are given in the sections below (e.g. in R Markdown table).

To cross-reference sections simply put the section header in square brackets, e.g. R output via `[R output]`.

2.3 Mathematics

Use mathematics in R Markdown as usual using the dollar sign `$`; either in inline mode with one dollar sign $E = mc^2$ or in display mode with two:

$$E = mc^2$$

Important to note: do not leave a space between the `$` and your mathematical notation.

Alternatively, you can use LaTeXfor more control, e.g. for setting equation numbers that can be cross-referenced:

$$\bar{X} = \frac{\sum_{i=1}^{n} X_i}{n} \tag{1}$$

You may refer to this equation using `\ref{eq:label}`, e.g., see Equation 1

3 Results

3.1 R output

R output is typically shown in the monospace font (here an example with the `mtcars` dataset):

```
##       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
```

With the "kable" method set as default for printing data frames (see also the `rmarkdown::pdf_document` documentation) the following data frame is displayed in a nicer table layout:

```
##                    mpg cyl  disp  hp drat    wt  qsec vs am gear carb
## Mazda RX4         21.0   6 160.0 110 3.90 2.620 16.46  0  1    4    4
## Mazda RX4 Wag     21.0   6 160.0 110 3.90 2.875 17.02  0  1    4    4
## Datsun 710        22.8   4 108.0  93 3.85 2.320 18.61  1  1    4    1
## Hornet 4 Drive    21.4   6 258.0 110 3.08 3.215 19.44  1  0    3    1
## Hornet Sportabout 18.7   8 360.0 175 3.15 3.440 17.02  0  0    3    2
## Valiant           18.1   6 225.0 105 2.76 3.460 20.22  1  0    3    1
## Duster 360        14.3   8 360.0 245 3.21 3.570 15.84  0  0    3    4
## Merc 240D         24.4   4 146.7  62 3.69 3.190 20.00  1  0    4    2
## Merc 230          22.8   4 140.8  95 3.92 3.150 22.90  1  0    4    2
## Merc 280          19.2   6 167.6 123 3.92 3.440 18.30  1  0    4    4
```

3.2 Tables

3.2.1 R Markdown table

Table 1 is a R Markdown table including a caption (note: the table number is automatically assigned) and label for cross-referencing:

Table 1: Your Caption

A	New	Table
left-aligned	center-aligned	right-aligned
$123	$456	$789
italics	~~strikethrough~~	**boldface**

3.2.2 Tables generated with R

3.2.2.1 Using the `knitr` and `kableExtra` packages Table 2 is an example when using `knitr::kable()` to generate the table and `kableExtra` to modify it:

Table 2: A table produced with knitr and kableextra

	Group 5				Group 6	
	Group 1		Group 2		Group 3	Group 4
	mpg	cyl	disp	hp	drat	wt
Mazda RX4	21.0	6	160	110	3.90	2.620
Mazda RX4 Wag	21.0	6	160	110	3.90	2.875
Datsun 710	22.8	4	108	93	3.85	2.320
Hornet 4 Drive	21.4	6	258	110	3.08	3.215
Hornet Sportabout	18.7	8	360	175	3.15	3.440

Note:
Your comments go here.

3.2.2.2 The `xtable` package Table 3 is an example when using this package. Note that the label set in `xtable()` has to include the `tab:` for properly rendering the cross-reference (I haven't yet figured out why).

Here, it is important that you add the chunk option `results = "asis"` inside `{r}` otherwise the PDF will contain the LaTeXcode of the table!

Table 3: A table made with xtable

	speed	dist
1	4.00	2.00
2	4.00	10.00
3	7.00	4.00
4	7.00	22.00
5	8.00	16.00
6	9.00	10.00

3.3 Figures

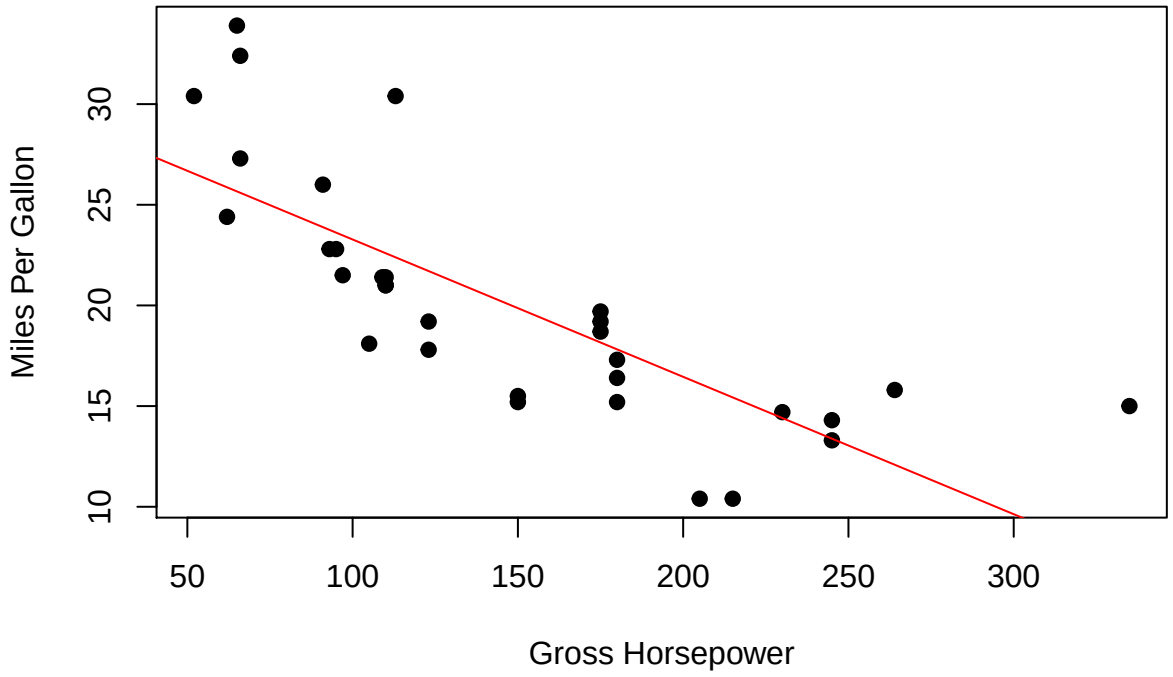

Figure 1: Relationship between horsepower and fuel economy

Figures are supported from R code and can be referenced (see Figure 1) by including the `\\label{}` tag in the `fig.cap` attribute of the R chunk: `fig.cap = "Relationship between horsepower and fuel economy\\label{fig:base-ref}"`. It is a quirky hack at the moment, see here.

Figure 2 is based on the `ggplot2` package (automatically loaded above with `tidyverse`).

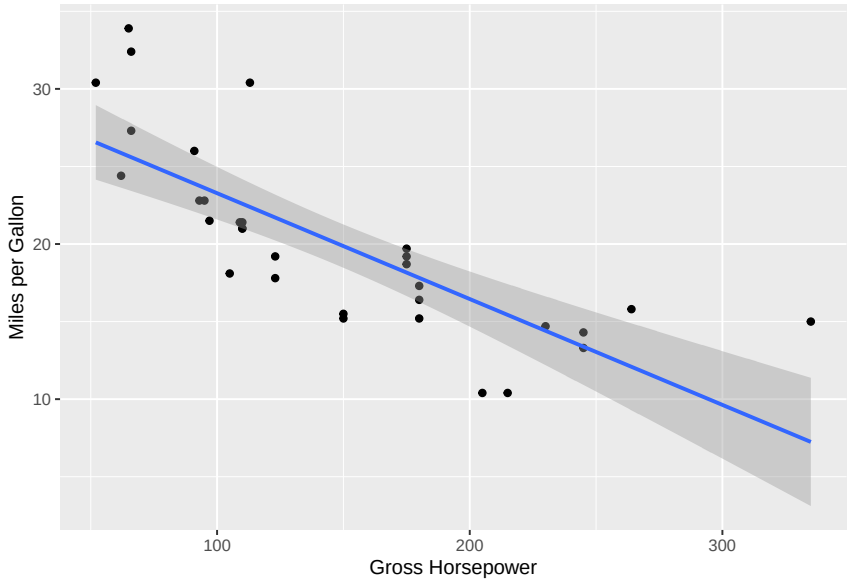

Figure 2: Relationship between horsepower and fuel economy-made with ggplot

4 Discussion

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5 Adding citations and bibliography

Link a `.bib` document via the YAML header, and the bibliography will be printed at the very end (as usual). The default bibliography style is provided in the `bib.bst` file (do not delete), which adopts the SAGE Harvard reference style.

References can be cited directly within the document using the R Markdown equivalent of the LaTeXcitation system `[@key]`, where key is the citation key in the first line of the entry in the .bib file. Example: (Taylor and Green, 1937). To cite multiple entries, separate the keys by semicolons, e.g. (Knupp, 1999; Kamm, 2000).

There is also the package [citr]((https://github.com/crsh/citr) which I highly recommend: `citr` provides functions and an RStudio add-in to search a BibTeX-file to create and insert formatted Markdown citations into the current document. If you are using the reference manager Zotero the add-in can access your reference database directly.

References

Kamm J (2000) Evaluation of the Sedov-von Neumann-Taylor blast wave solution. Technical Report Technical Report LA-UR-00-6055, Los Alamos National Laboratory.

Knupp P (1999) Winslow smoothing on two-dimensional unstructured meshes. *Eng Comput* 15: 263–268.

Taylor G and Green A (1937) Mechanism of the production of small eddies from large ones. *P Roy Soc Lond A Mat* 158(895): 499–521.