

A Tufte Inspired Manuscript

Using Quarto ...and Typst!

v.1.0

Tufte Inspired Developersgithub.com/fredguth/tufte-inspired

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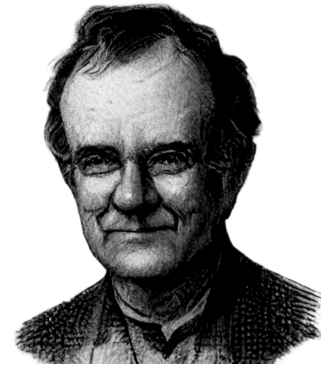


Figure 1. Edward R. Tufte, godfather of charts, slayer of slide decks

This Manuscript format for Quarto is influenced by the design and typography of Edward Tufte’s books and the *Tufte LaTeX* handout template. This document aims to be at once a demonstration of the features of the *Tufte Inspired* manuscript format and a guide to their use.

Introduction

This document demonstrates the use of a number of advanced page layout features to produce an attractive and usable document inspired by the Tufte handout style and the use of Tufte’s styles in RMarkdown documents (Xie et al. 2018).

The Tufte handout style is a style that Edward Tufte uses in his books and handouts. Tufte’s style is known for its extensive use of sidenotes, tight integration of graphics with text, and well-set typography. Quarto¹ supports most of the layout techniques that are used in the Tufte handout style for both HTML and LaTeX/PDF output.

Arbitrary Margin Content

You can include anything in the margin by placing the class `.column-margin` on the element. See an example on the right about the first fundamental theorem of calculus.

Xie, Yihui, J. J. Allaire, and Garrett Grolemond. 2018. Tufte Handouts. In *R Markdown: The Definitive Guide*, 137–146. Chapman, Hall/CRC. <https://doi.org/10.1201/9781138359444-6>

We know from the *first fundamental theorem of calculus* that for x in $[a, b]$:

$$\frac{d}{dx} \left(\int_a^x f(u) du \right) = f(x). \quad (1)$$

¹To learn more, you can read more about Quarto or visit Quarto’s Github repository.

Arbitrary Full Width Content

Any content can span to the full width of the page, simply place the element in a div and add the class `column-page-right`. For example, the following code will display its contents as full width.

```

::: {.fullwidth}
Any _full width_ content here.
:::

```

Below is an example:

R is free software and comes with **ABSOLUTELY NO WARRANTY**. You are welcome to redistribute it under the terms of the GNU General Public License versions 2 or 3. For more information about these matters see <https://www.gnu.org/licenses/>.

```

```{r}
#| label: fullwidth
#| fig-cap: "A full width figure."
#| fig-width: 11
#| fig-height: 3
#| fig-column: page-right
#| warning: false
ggplot(diamonds, aes(carat, price)) + geom_smooth() +
 facet_grid(~ cut)
```

```

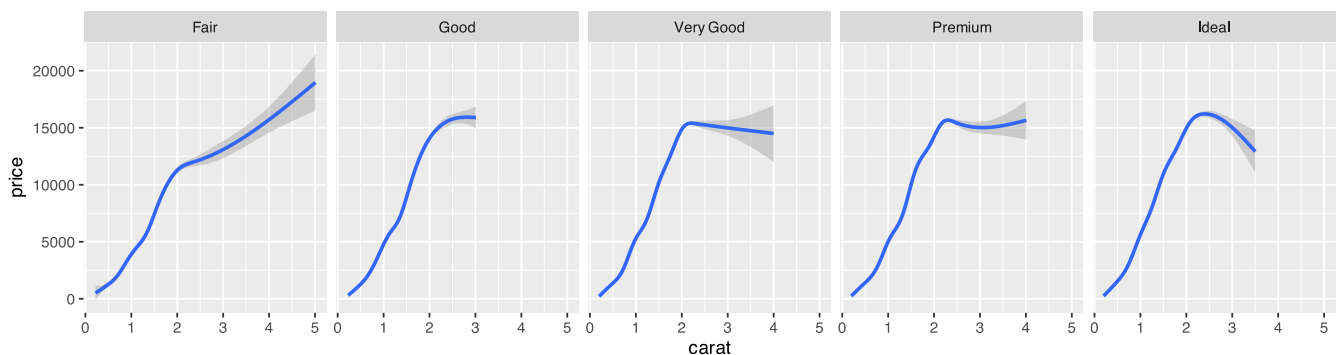


Figure 2. A full width figure.

Full Width Figures

You can arrange for figures to span across the entire page by using the chunk option `fig-column: page-right`.

```

```{r}
#| label: fig-fullwidth
#| fig-cap: "A full width figure."
#| fig-width: 11

```

```

#| fig-height: 3
#| fig-column: page-right
#| warning: false
ggplot(diamonds, aes(carat, price)) + geom_smooth() +
 facet_grid(~ cut)
```

```

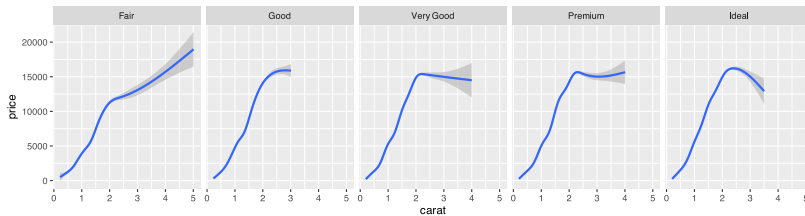


Figure 3. A full width figure.

Other chunk options related to figures can still be used, such as `fig-width`, `fig-cap`, and so on. For full width figures, usually `fig-width` is large and `fig-height` is small. In the above example, the plot size is 11×3 .

Main Column Figures

Besides margin and full width figures, you can of course also include figures constrained to the main column. This is the default type of figures in the LaTeX/HTML output.

```

```{r}
#| label: fig-main
#| fig-cap: "A figure in the main column."
ggplot(diamonds, aes(cut, price)) + geom_boxplot()
```

```

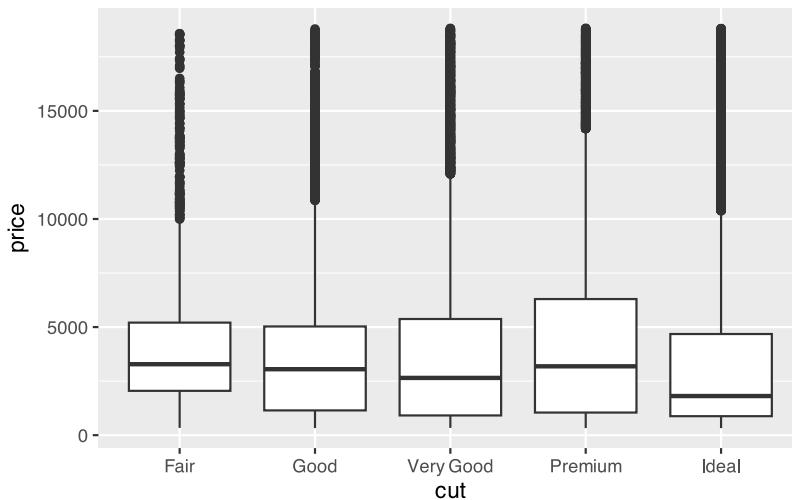


Figure 4. A figure in the main column.

Margin Captions

When you include a figure constrained to the main column, you can choose to place the figure's caption in the margin by using the `cap-location` chunk option. For example:

```
``{r}
#| label: fig-main-margin-cap
#| fig-cap: "A figure with a longer caption. The figure
appears in the main column, but the caption is placed in the
margin. Captions can even contain elements like a citation
such as @xie2018."
#| cap-location: margin
ggplot(diamonds, aes(cut, price)) + geom_boxplot()
``
```

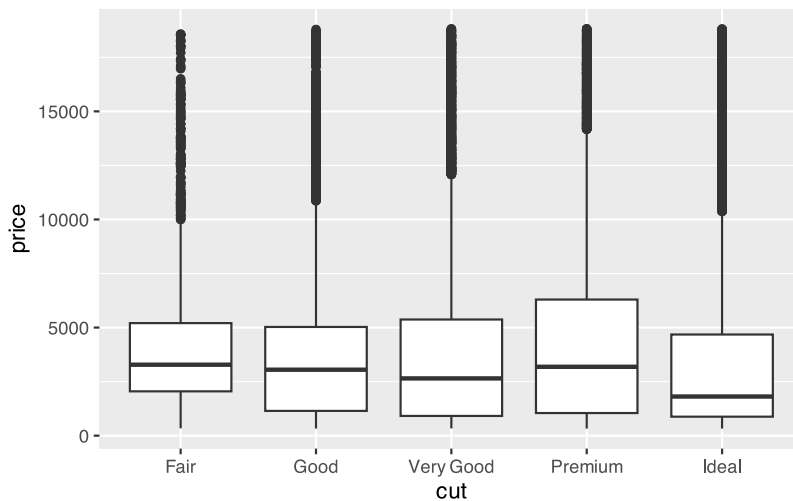


Figure 5. A figure with a longer caption. The figure appears in the main column, but the caption is placed in the margin. Captions can even contain elements like a citation such as (Xie, Allaire, and Grolemund 2018) .

Xie, Yihui, J. J. Allaire, and Garrett Grolemund. 2018. Tufte Handouts. In *R Markdown: The Definitive Guide*, 137–146. Chapman, Hall/CRC. <https://doi.org/10.1201/9781138359444-6>

Sidenotes

One of the most prominent and distinctive features of this style is the extensive use of sidenotes. There is a wide margin to provide ample room for sidenotes and small figures. Any use of a footnote will automatically be converted to a sidenote.

This is a span that has the class `column-margin` which places it in the margin without the sidenote mark. If you'd like to place ancillary information in the margin without the sidenote mark (the

superscript number), you can use apply the `column-margin` class to the element.

References

References can be displayed as margin notes for HTML output. For example, we can cite R here (R Core Team 2021).

R Core Team. 2021. R: A Language and Environment for Statistical Computing

i Note

This feature depends upon `link-citations` to locate and place references in the margin. This is enabled by default, but if you disable `link-citations` then references in the HTML output will be placed at the end of the output document as they normally are.

Tables

You can use the `kable()` function from the **knitr** package to format tables that integrate well with the rest of the Tufte handout style. The table captions are placed in the margin like figures in the HTML output.

```
```\r}
#| tbl-cap-location: margin
knitr::kable(
 mtcars[1:6, 1:6], caption = 'A subset of mtcars.'
)
```
```

Table 1. A subset of mtcars.

| | 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 |
| Valiant | 18.1 | 6 | 225 | 105 | 2.76 | 3.460 |

Responsiveness

The HTML page layout is responsive- as the page width shrinks, elements will automatically adjust their position. Elements that appear in the margins will move inline with the content and elements that span the body and margin will automatically span only the body.

More Examples

The rest of this document consists of a few test cases to make sure everything still works well in slightly more complicated scenarios. First we generate two plots in one figure environment with the chunk option `fig-show: hold`:

```
``{r}
#| label: fig-two-together
#| fig-cap: "Two plots in one figure environment."
#| fig-show: hold
#| warning: false
#| cap-location: margin
p <- ggplot(mtcars2, aes(hp, mpg, color = am)) +
  geom_point()
p
p + geom_smooth()
``
```

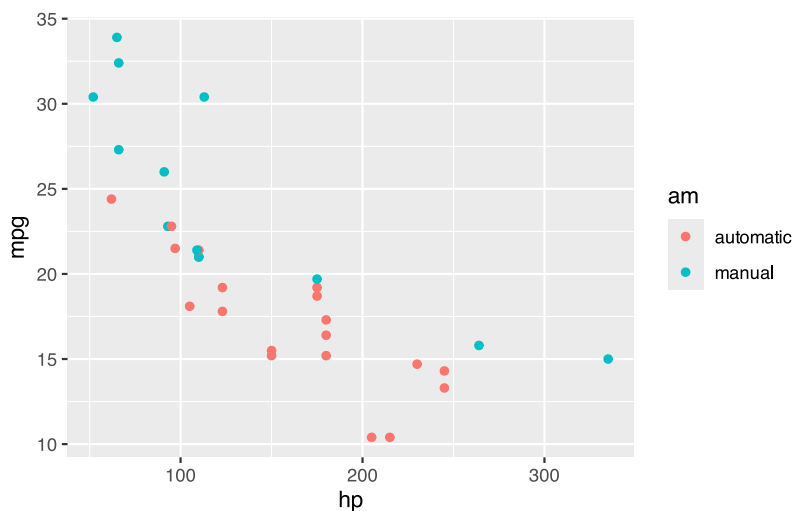


Figure 6. Two plots in one figure environment.

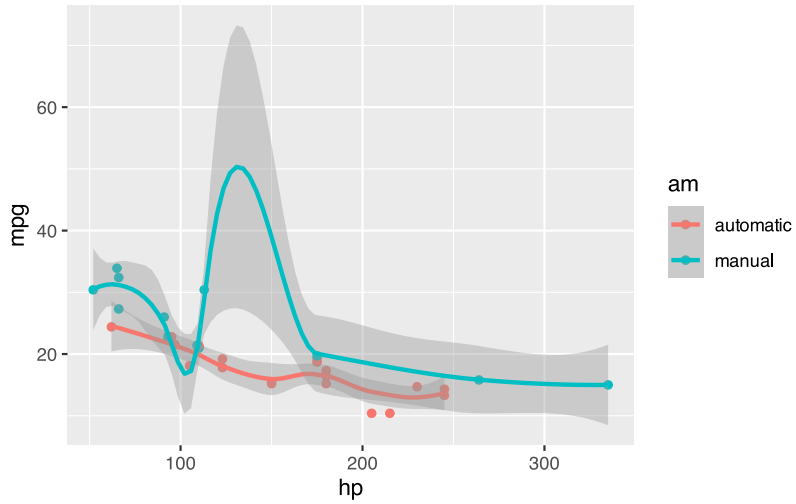


Figure 7. Two plots in one figure environment.

Then two plots in separate figure environments (the code is identical to the previous code chunk, but the chunk option is the default `fig-show: asis now`):

```
```{r fig-two-separate, ref.label='fig-two-together',
fig.cap=sprintf("Two plots in separate figure environments
(the %s plot).", c("first", "second")), message=FALSE}
#| cap-location: margin
p <- ggplot(mtcars2, aes(hp, mpg, color = am)) +
 geom_point()
p
p + geom_smooth()
```
```

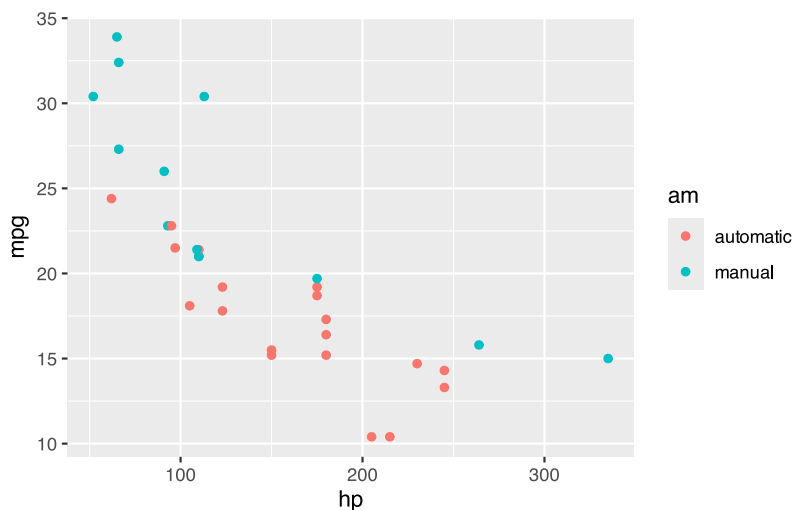


Figure 8. Two plots in separate figure environments (the first plot).

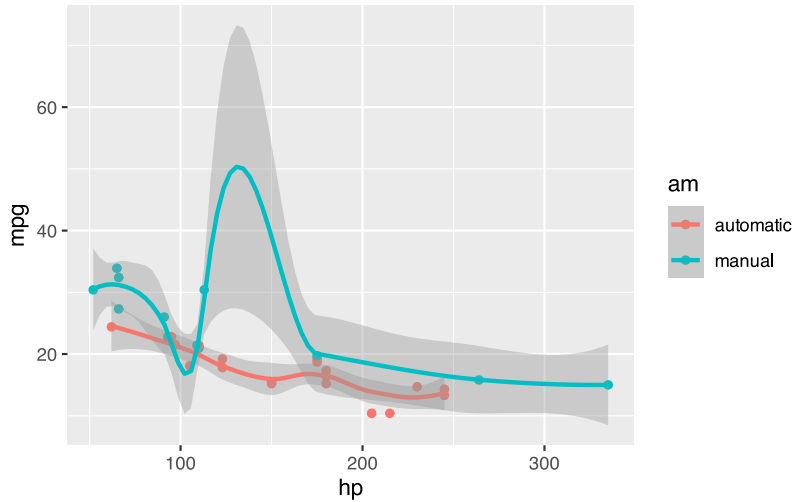


Figure 9. Two plots in separate figure environments (the second plot).

You may have noticed that the two figures have different captions, and that is because we used a character vector of length 2 for the chunk option `fig.cap` (something like `fig.cap = c('first plot', 'second plot')`).

💡 Using R within Chunk Options

If you wish to use raw R expressions as part of the chunk options (like above), then you need to define those in the `tag=value` format within the curly brackets `{r label, tag=value}` instead of the `tag: value` YAML syntax on a new line starting with the hashpipe `#|`. The former approach is documented on [knitr's website](#) while the latter is explained in [Quarto's documentation](#).

Next we show multiple plots in margin figures. Similarly, two plots in the same figure environment in the margin:

Then two plots from the same code chunk placed in different figure environments:

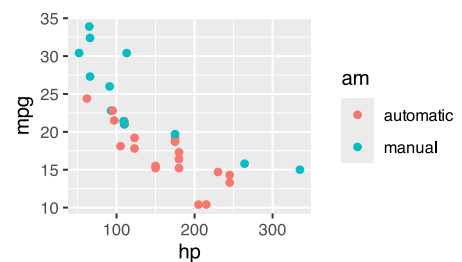
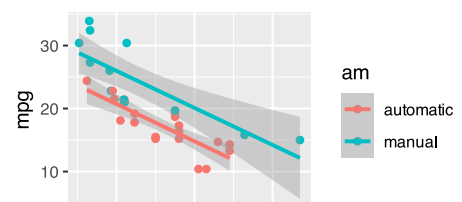


Figure 10. Two plots in one figure environment in the margin.



| Sepal.Length | Sepal.Width | Petal.Length | Petal.Width |
|--------------|-------------|--------------|-------------|
| 5.1 | 3.5 | 1.4 | 0.2 |
| 4.9 | 3.0 | 1.4 | 0.2 |
| 4.7 | 3.2 | 1.3 | 0.2 |
| 4.6 | 3.1 | 1.5 | 0.2 |
| 5.0 | 3.6 | 1.4 | 0.2 |
| 5.4 | 3.9 | 1.7 | 0.4 |
| 4.6 | 3.4 | 1.4 | 0.3 |
| 5.0 | 3.4 | 1.5 | 0.2 |
| 4.4 | 2.9 | 1.4 | 0.2 |
| 4.9 | 3.1 | 1.5 | 0.1 |
| 5.4 | 3.7 | 1.5 | 0.2 |
| 4.8 | 3.4 | 1.6 | 0.2 |
| 4.8 | 3.0 | 1.4 | 0.1 |

| Sepal.Length | Sepal.Width | Petal.Length | Petal.Width |
|--------------|-------------|--------------|-------------|
| 5.1 | 3.5 | 1.4 | 0.2 |
| 4.9 | 3.0 | 1.4 | 0.2 |
| 4.7 | 3.2 | 1.3 | 0.2 |
| 4.6 | 3.1 | 1.5 | 0.2 |
| 5.0 | 3.6 | 1.4 | 0.2 |
| 5.4 | 3.9 | 1.7 | 0.4 |
| 4.6 | 3.4 | 1.4 | 0.3 |
| 5.0 | 3.4 | 1.5 | 0.2 |
| 4.4 | 2.9 | 1.4 | 0.2 |
| 4.9 | 3.1 | 1.5 | 0.1 |
| 5.4 | 3.7 | 1.5 | 0.2 |

We blended some tables in the above code chunk only as *placeholders* to make sure there is enough vertical space among the margin figures, otherwise they will be stacked tightly together. For a practical document, you should not insert too many margin figures consecutively and make the margin crowded.

You do not have to assign captions to figures. We show three figures with no captions below in the margin, in the main column, and in full width, respectively.

```
``{r}
#| warning: false
```

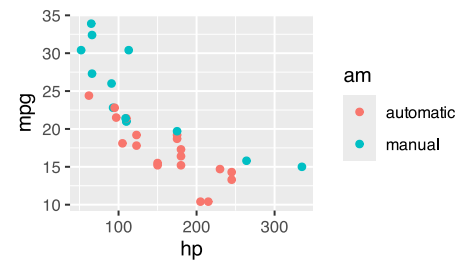


Figure 12. Two plots in separate figure environments in the margin

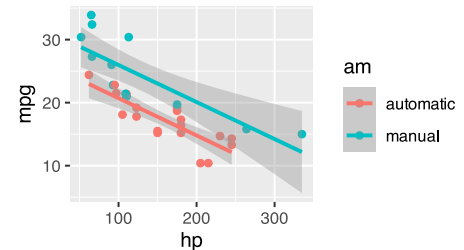
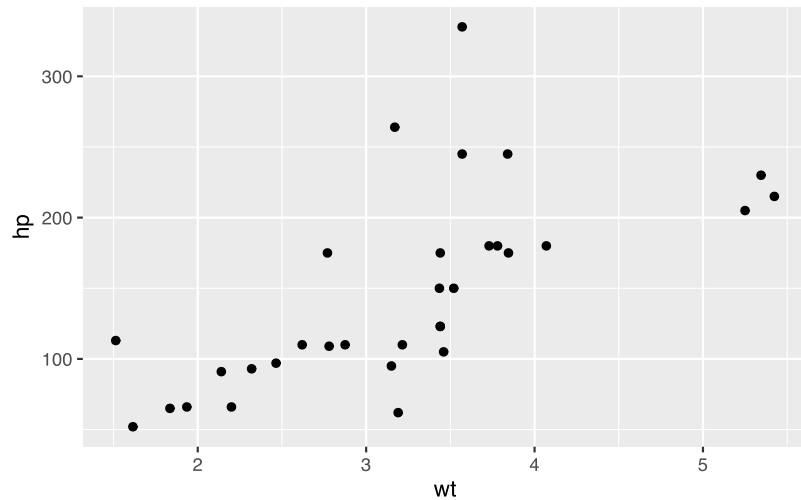


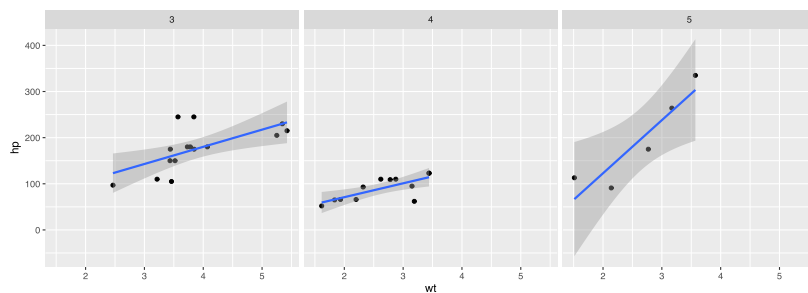
Figure 13. Two plots in separate figure environments in the margin

```
``{r}
#| fig-width: 3.5
#| fig-height: 2
#| column: margin
# a boxplot of weight vs
transmission; this figure
# will be placed in the margin
ggplot(mtcars2, aes(am, wt)) +
  geom_boxplot() +
  coord_flip()
``
```

```
# a figure in the main column
p <- ggplot(mtcars, aes(wt, hp)) + geom_point()
p
````
```



```
````{r}
#| fig-width: 11
#| fig-height: 4
#| column: page-right
#| warning: false
# a fullwidth figure
p + geom_smooth(method = 'lm') + facet_grid(~ gear)
````
```



## Some Notes on Page Layout

To see the Quarto markdown source of this example document, you may follow [this link to Github](#).

## Bibliography

R Core Team. 2021. R: A Language and Environment for Statistical Computing

Xie, Yihui, J. J. Allaire, and Garrett Grolemund. 2018. Tufte Handouts. In *R Markdown: The Definitive Guide*, 137–146. Chapman, Hall/CRC. <https://doi.org/10.1201/9781138359444-6>