## Introduction

This document demonstrates the use of a number of these 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 [@xie2018]. 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. Quarto[1] supports most of the layout techniques that are used in the Tufte handout style for both HTML and LaTeX/PDF output.

```
---
title: "An Example Using the Tufte Style"
author: "John Smith"
format:
  html: default
  pdf: default

# places footnotes and cited sources in the margin
# other layout options (for example placing a
# figure in the margin)  will be set on per element
# in examples below
reference-location: margin
---
```

These layout features are designed with two important goals in mind:

1. To produce both PDF and HTML output with similar styles from the same Quarto document;
2. To provide simple syntax to write elements of the Tufte style such as side notes and margin figures. If you'd like a figure placed in the margin, just set the option `fig-column: margin` for your code chunk, and we will take care of the details for you[2].

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

[2] You never need to think about `\begin{marginfigure}` or `<span class="marginfigure">`; the LaTeX and HTML code under the hood

If you have any feature requests or find bugs in this capabilities, please do not hesitate to file them to https://github.com/quarto-dev/quarto-cli/issues.

# Figures

## Margin Figures

Images and graphics play an integral role in Tufte's work. To place figures in the margin you can use the **Quarto** chunk option `column: margin`. For example:

```
library(ggplot2)
mtcars2 <- mtcars
mtcars2$am <- factor(
  mtcars$am, labels = c('automatic', 'manual')
)
ggplot(mtcars2, aes(hp, mpg, color = am)) +
  geom_point() + geom_smooth() +
  theme(legend.position = 'bottom')
```

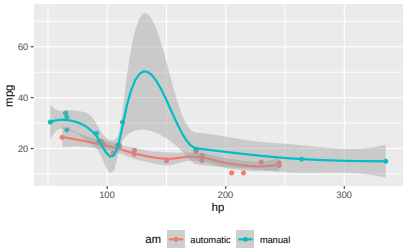


Figure 1: MPG vs horsepower, colored by transmission.

Note the use of the `fig-cap` chunk option to provide a figure caption. You can adjust the proportions of figures using the `fig-width` and `fig-height` chunk options. These are specified in inches, and will be automatically scaled down to fit within the handout margin.

## Arbitrary Margin Content

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

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

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

may be complicated, but you never need to learn or write such code.

## Full Width Figures

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

```
ggplot(diamonds, aes(carat, price)) + geom_smooth() +
  facet_grid(~ cut)
```

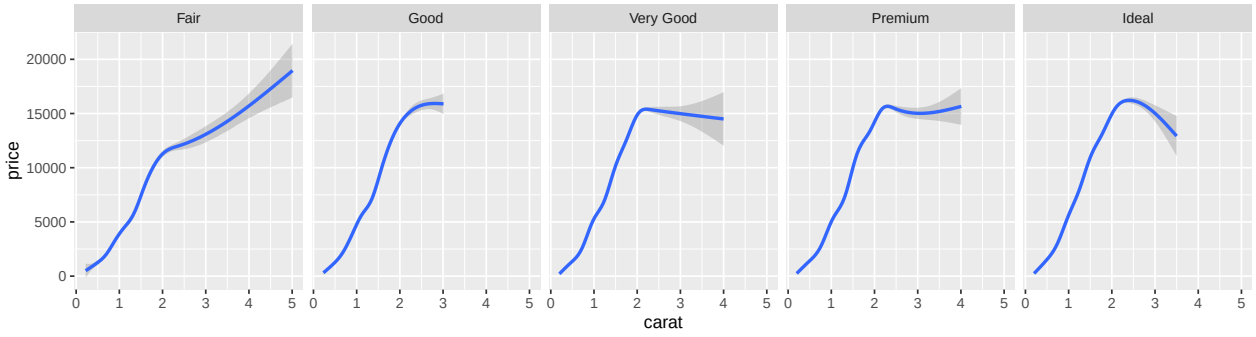


Figure 2: A full width figure.

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 $11 \times 3$.

## 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:

## 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.

```
ggplot(diamonds, aes(cut, price)) + geom_boxplot()
```

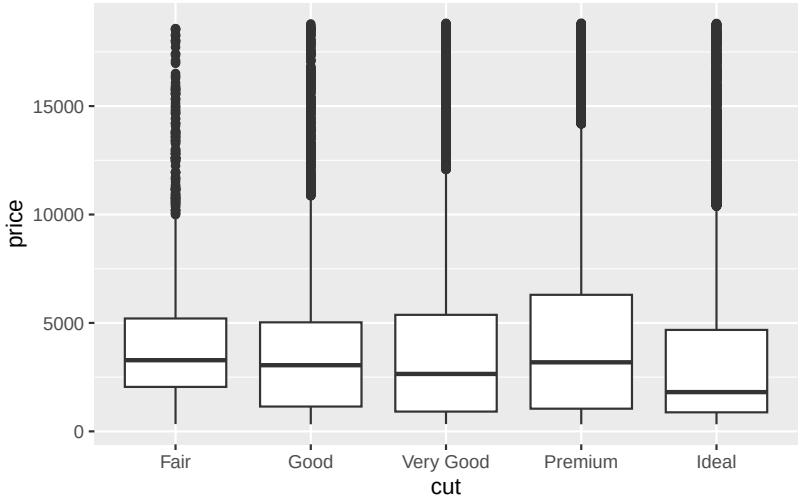


Figure 3: A figure in the main column.

## 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:

```
ggplot(diamonds, aes(cut, price)) + geom_boxplot()
```

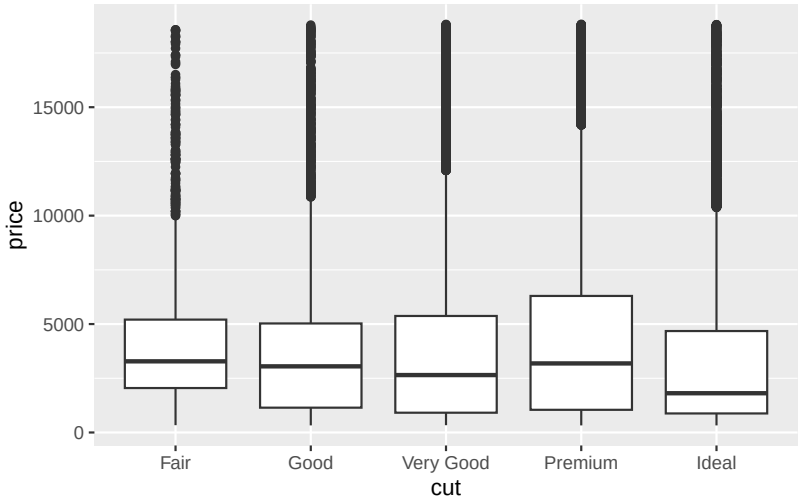


Figure 4: A figure with a longer caption. The figure appears in the main column, but the caption is placed in the margin. Caption can even contain elements like a citation such as @xie2018.

## 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.

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.

This is a span that has the class `column-margin` which places it in the margin without the sidenote mark.

## References

References can be displayed as margin notes for HTML output. For example, we can cite R here [@R-base].

> **i** 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.