

# OSD2025 Quarto demo with knitr engine

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## Add a heading in your document

This is a sentence with some **bold text**, *italic text*, `code`, and a [link](#).



Figure 1: The Quarto logo

See Figure 1 for the Quarto logo.

Equation 1 gives the formula for the population mean:

$$\mu = \frac{\sum x}{N} \quad (1)$$

Section shows how to add R or Python code chunks.

The palmerpenguins package was developed by Horst, Hill, and Gorman (2020). We will create a document using Quarto (Allaire et al. 2025) and R (R Core Team 2024) or Python (Van Rossum and Drake 2009).

This sentence ends with a footnote.<sup>1</sup>

## Add R/Python code chunks

### Add R code

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<sup>1</sup>This is an example footnote.

```
library(palmerpenguins) # for data
library(tidyverse)      # for data wrangling and visualization
library(knitr)          # for tables

ggplot(data = penguins,
       aes(x = flipper_length_mm,
           y = bill_length_mm)) +
  geom_point(aes(color = species,
                 shape = species))
```

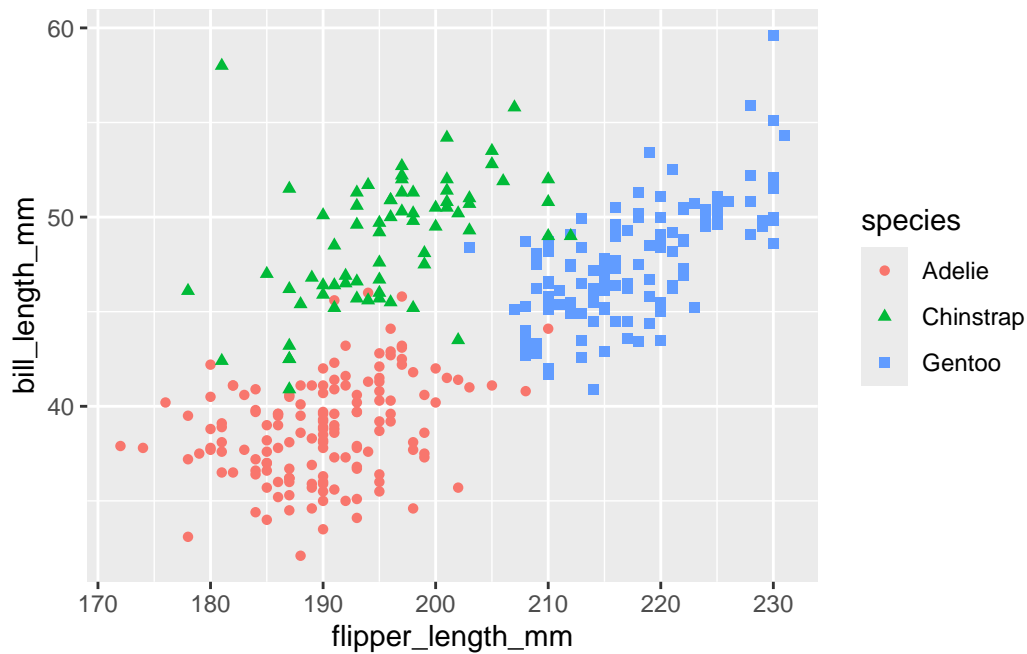


Figure 2: Scatterplot of flipper and bill lengths in R

### Add Python code

```
import numpy as np
import matplotlib.pyplot as plt
from palmerpenguins import load_penguins

penguins = load_penguins()

penguins['species_color'] = penguins['species']
```

```
penguins['species_color'].replace(['Adelie', 'Chinstrap', 'Gentoo'],
                                  ['red', 'green', 'blue'], inplace=True)

penguins.plot.scatter(x='flipper_length_mm',
                      y='bill_length_mm',
                      c='species_color')
```

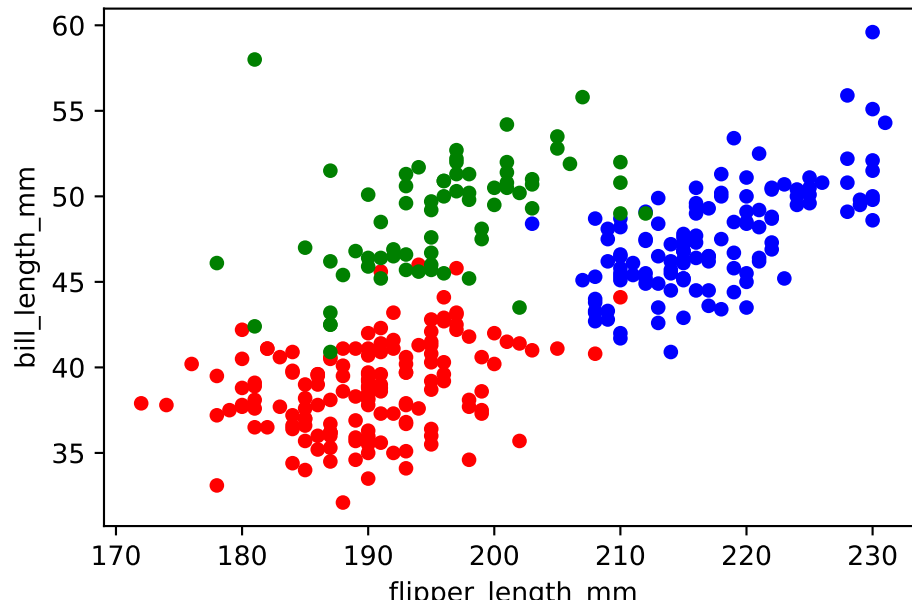


Figure 3: Scatterplot of flipper and bill lengths in Python

### Add inline code

The palmerpenguins package contains data for 344 penguins.

### Add tables

Table 1, Table 2, and Table 3 show different table options in Quarto.

### Markdown

```
| fruit | price |
|-----|-----|
| apple | 2.05  |
| pear  | 1.37  |
| orange| 3.09  |
```

```
: Fruit prices {#tbl-md .striped .hover}
```

Table 1: Fruit prices

fruit	price
apple	2.05
pear	1.37
orange	3.09

## R

```
penguins %>%
  group_by(species) %>%
  summarise(
    `Mean bill length` = mean(bill_length_mm, na.rm = T),
    `Min bill length` = min(bill_length_mm, na.rm = T),
    `Max bill length` = max(bill_length_mm, na.rm = T),
    `Mean flipper length` = mean(flipper_length_mm, na.rm = T),
    `Min flipper length` = min(flipper_length_mm, na.rm = T),
    `Max flipper length` = max(flipper_length_mm, na.rm = T),
    `Correlation, r` = cor(flipper_length_mm, bill_length_mm, use = "complete")
  ) %>%
  kable(digits = c(2, 2, 2, 2, 2, 2))
```

Table 2: Summary statistics for flipper and bill lengths

species	Mean bill length	Min bill length	Max bill length	Mean flipper length	Min flipper length	Max flipper length	Correlation, r
Adelie	38.79	32.1	46.0	189.95	172	210	0.33
Chinstrap	48.83	40.9	58.0	195.82	178	212	0.47
Gentoo	47.50	40.9	59.6	217.19	203	231	0.66

## Python

```
from tabulate import tabulate
from IPython.display import Markdown

# Convert to markdown table
Markdown(tabulate(penguins[["species", "island",
                           "bill_length_mm",
                           "flipper_length_mm"]].head(),
                  headers='keys', tablefmt='github'))
```

Table 3: First rows of penguins dataframe

	species	island	bill_length_mm	flipper_length_mm
0	Adelie	Torgersen	39.1	181
1	Adelie	Torgersen	39.5	186
2	Adelie	Torgersen	40.3	195
3	Adelie	Torgersen	nan	nan
4	Adelie	Torgersen	36.7	193

## References

- Allaire, J. J., Charles Teague, Carlos Scheidegger, Yihui Xie, Christophe Dervieux, and Gordon Woodhull. 2025. “Quarto.” <https://doi.org/10.5281/zenodo.5960048>.
- Horst, Allison M, Alison Presmanes Hill, and Kristen B Gorman. 2020. *Allison-horst/Palmerpenguins: V0.1.0*. Zenodo. <https://doi.org/10.5281/ZENODO.3960218>.
- R Core Team. 2024. *R: A Language and Environment for Statistical Computing*. Vienna, Austria: R Foundation for Statistical Computing. <https://www.R-project.org/>.
- Van Rossum, Guido, and Fred L. Drake. 2009. *Python 3 Reference Manual*. Scotts Valley, CA: CreateSpace.