



# AE 05: Waffle charts for visualizing proportions

## Suggested answers

APPLICATION EXERCISE

ANSWERS

MODIFIED

February 6, 2025

### Important

These are suggested answers. This document should be used as reference only, it's not designed to be an exhaustive key.

```
library(tidyverse)
library(palmerpenguins)
library(waffle)
library(viridis)

# fix seed value for reproducibility
set.seed(123)

theme_set(theme_void())
```

## Waffle charts

[{waffle}](#) provides a {ggplot2} implementation of waffle plots. The typical workflow consists of preparing the data by tabulating in advance and then plotting it with {ggplot2} and `geom_waffle()`.

## Basic waffle chart

**Demonstration:** Prepare the `penguins` data frame to visualize the number of penguins by species.

```
penguins |>
  count(species)
```

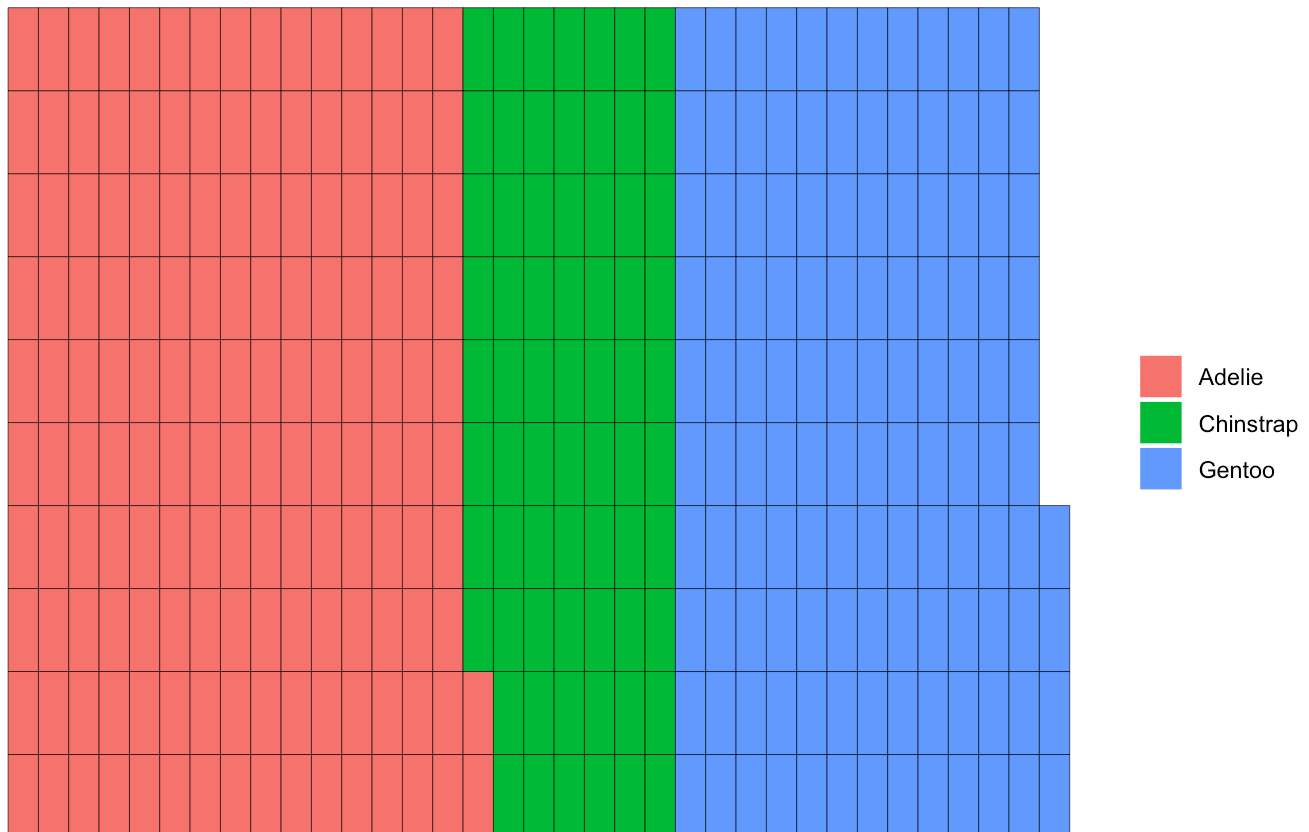
```
# A tibble: 3 × 2
  species      n
  <fct>    <int>
1 Adelie    152
```

```
2 Chinstrap    68
3 Gentoo       124
```

**Demonstration:** Use the prepared data to draw a basic color-coded waffle chart

```
penguins |>
  count(species) |>
  ggplot(mapping = aes(fill = species, values = n)) +
  geom_waffle() +
  labs(
    title = "Penguins by species",
    x = NULL, y = NULL, fill = NULL
  )
```

Penguins by species



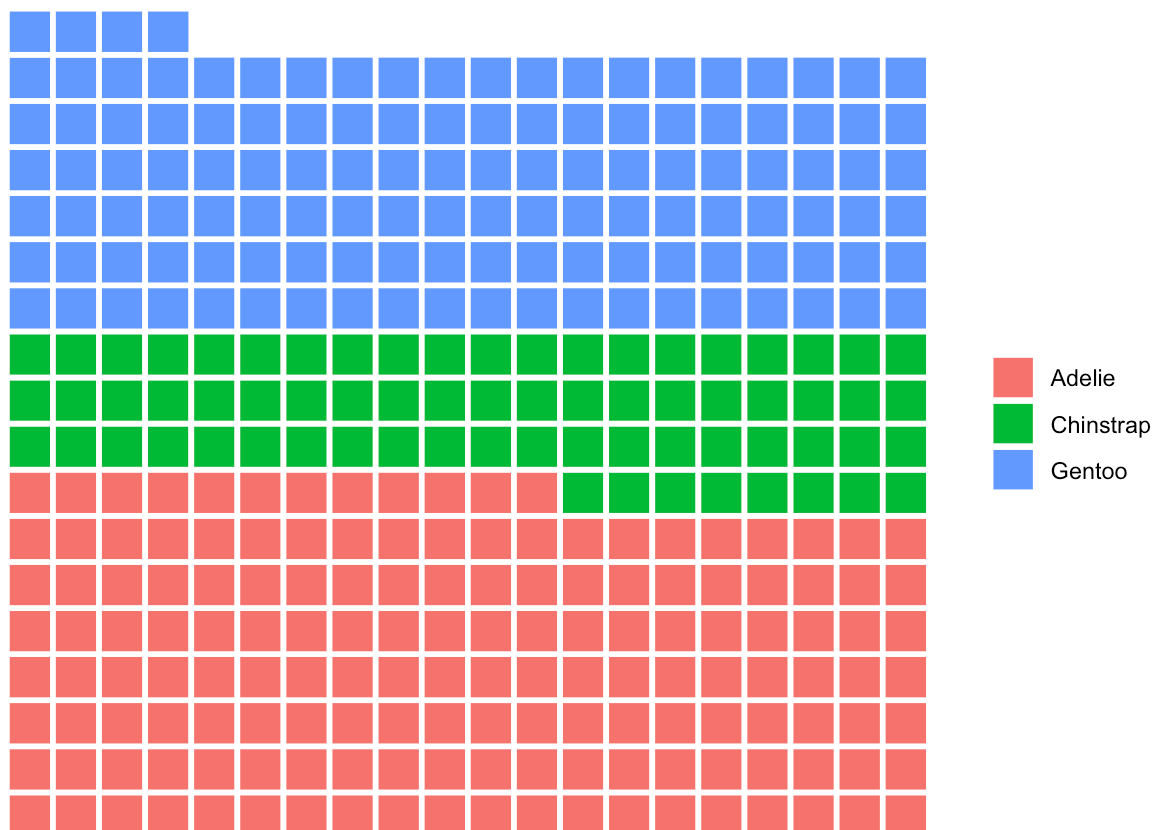
## Improve the waffle chart

**Your turn:** Adjust the waffle chart to use a fixed aspect ratio so the symbols are squares. Rotate the chart so the squares are stacked vertically.

```
penguins |>
  count(species) |>
```

```
ggplot(mapping = aes(fill = species, values = n)) +
  geom_waffle(
    n_rows = 20,
    size = 1,
    color = "white",
    flip = TRUE
  ) +
  labs(
    title = "Penguins by species",
    x = NULL, y = NULL, fill = NULL
  ) +
  coord_equal()
```

Penguins by species



**Demonstration:** {waffle} will draw all observations on the chart. For larger datasets, this is problematic. Instead, we might want to visualize the **proportion** of observations in each category. Use `geom_waffle()` to represent the data as **proportions** instead.

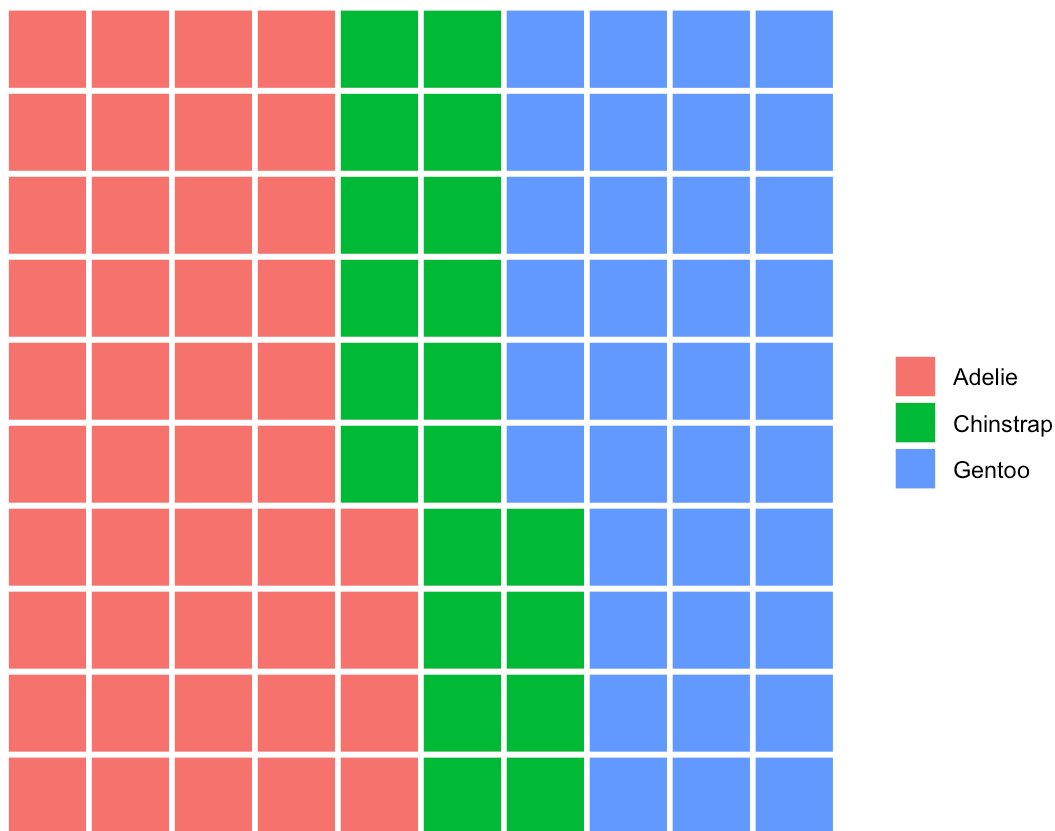
```
penguins |>
  count(species) |>
  ggplot(mapping = aes(fill = species, values = n)) +
  geom_waffle(
```

```

    size = 1,
    color = "white",
    make_proportional = TRUE
  ) +
  labs(
    title = "Penguins by species",
    x = NULL, y = NULL, fill = NULL
  ) +
  coord_equal()

```

Penguins by species



**Your turn:** Adjust the waffle chart to use a better color palette and move the legend to the top.

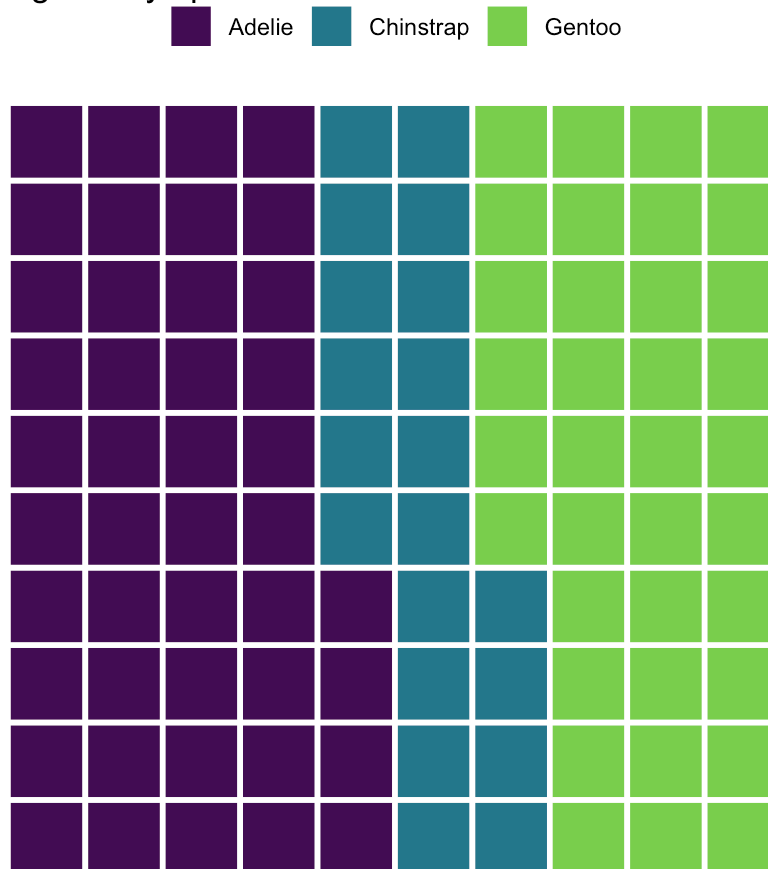
```

penguins |>
  count(species) |>
  ggplot(mapping = aes(fill = species, values = n)) +
  geom_waffle(
    size = 1,
    color = "white",
    make_proportional = TRUE
  ) +
  scale_fill_viridis_d(end = 0.8) +

```

```
labs(
  title = "Penguins by species",
  x = NULL, y = NULL, fill = NULL
) +
coord_equal() +
theme(legend.position = "top")
```

Penguins by species

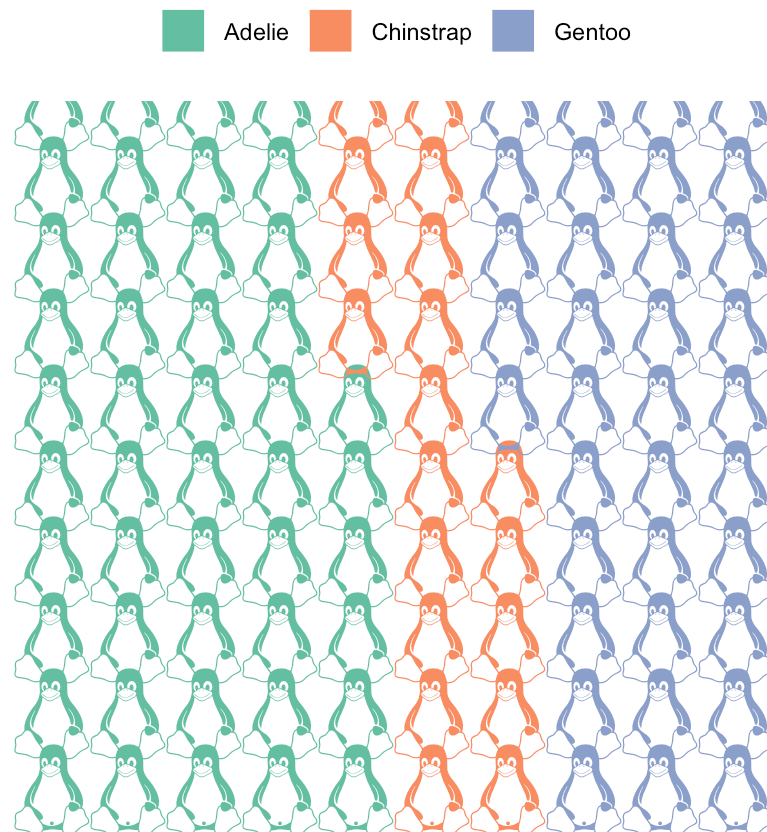


**Bonus:** Adjust the waffle chart to symbolize each penguin using a penguin symbol.

```
penguins |>
  # sample 100 rows since we cannot calculate proportions using this method
  slice_sample(n = 100) |>
  count(species) |>
  # use waffle() instead of ggplot()
  waffle(
    rows = 10,
    # get the linux logo for a penguin
    use_glyph = "linux",
    glyph_font_family = "FontAwesome5Brands-Regular"
  ) +
  labs(
```

```
title = "Penguins by species",  
x = NULL, y = NULL, fill = NULL  
) +  
theme(legend.position = "top")
```

## Penguins by species



### Session information

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