Bar charts

```r
library(tidyverse)
penguins |>
  ggplot(aes(x = species)) +
  geom_bar()
```


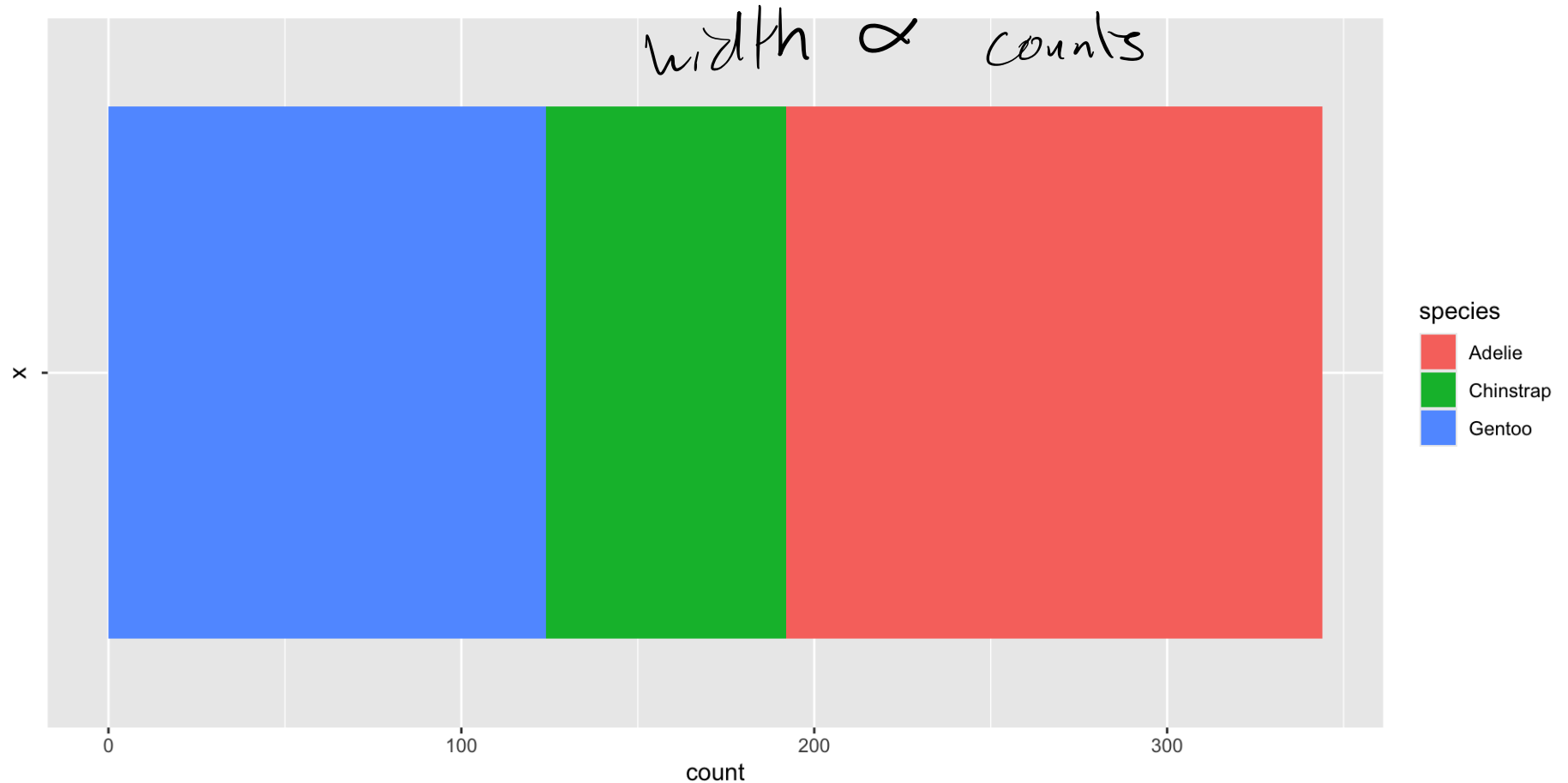
height $\propto$ Counts (proportions)
width $\propto$ 1

Spine charts - height version

```
1  penguins |>
2    ggplot(aes(fill = species, x = "")) +
3    geom_bar()
```


height ∝ counts
width ∝ nothing
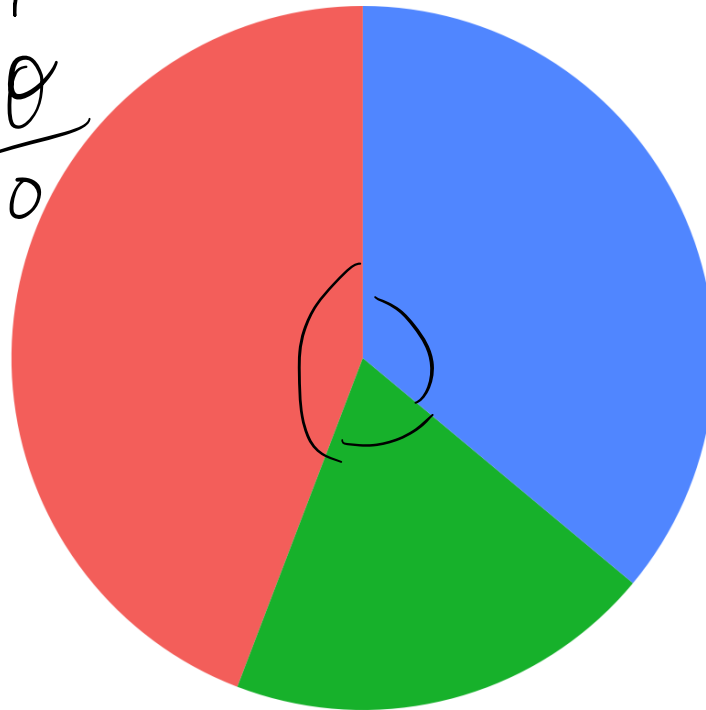
Spine charts - width version

```
1  penguins |>
2    ggplot(aes(fill = species, x = "")) +
3    geom_bar() +
4    coord_flip()
```

So you want to make pie charts...

```
1  penguins |>
2    ggplot(aes(fill = species, x = "")) +
3    geom_bar(aes(y = after_stat(count))) +
4    coord_polar(theta = "y") +
5    theme_void()
```

Total area = πr^2

Slice area: $\dfrac{\pi r^2 \cdot \theta}{360}$

$\theta \propto$ counts
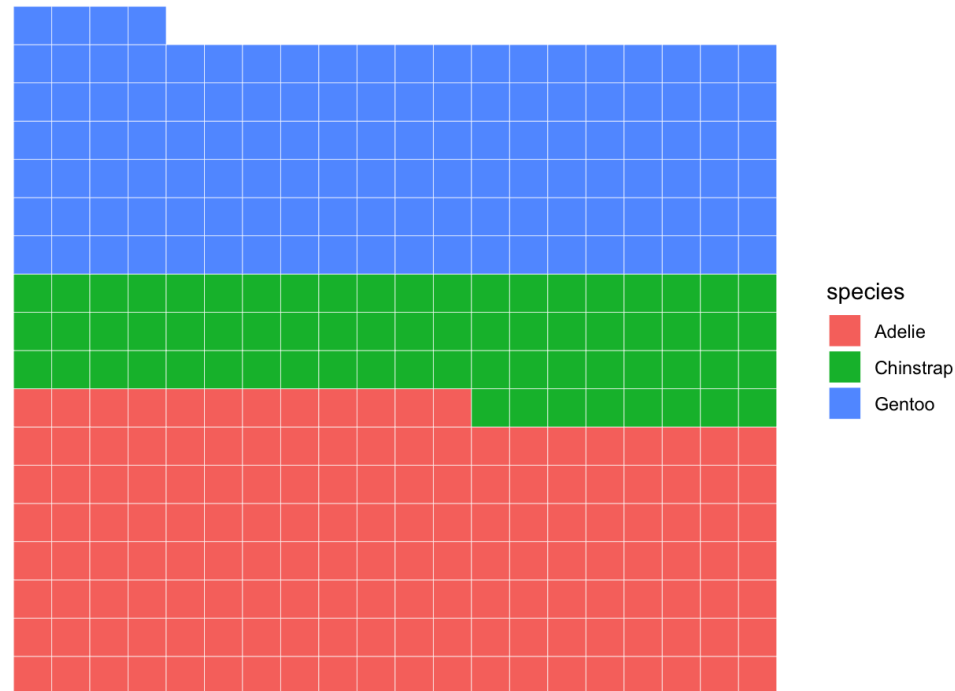
$r \propto 1$

radius

species
- Adelie
- Chinstrap
- Gentoo

Waffle charts **are cooler anyway...**

```
1  library(waffle)
2  penguins |>
3    group_by(species) |>
4    summarize(count = n(), .groups = "drop") |>
5    ggplot(aes(fill = species, values = count)) +
6    geom_waffle(n_rows = 20, color = "white", flip = TRUE) +
7    coord_equal() +
8    theme_void()
```

Rose diagrams

```
1  penguins |>
2    ggplot(aes(x = species)) +
3    geom_bar(fill = "darkblue") +
4    coord_polar() +
5    scale_y_sqrt()
```

$$\theta \propto 1$$

$$\text{Area} \propto r^2 \cdot \theta \propto (\text{counts})^2$$

if $r = \text{count}$

$$r = \sqrt{\text{count}}$$

$$\Rightarrow \text{Area} \propto \text{counts}$$