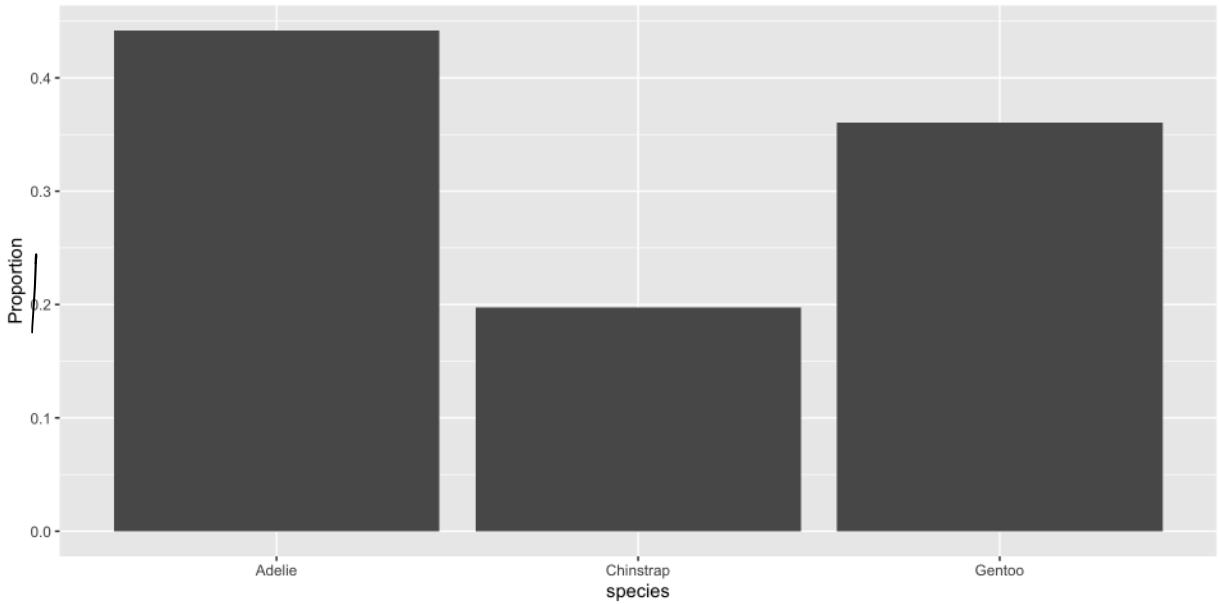
Bar charts with proportions

- `after_stat()` indicates the aesthetic mapping is performed after statistical transformation
- Use `after_stat(count)` to access the `stat_count()` called by `geom_bar()`

```
1 penguins |>
2   ggplot(aes(x = species)) +
3   geom_bar(aes(y = after_stat(count) / sum(after_stat(count)))) +
4   labs(y = "Proportion")
```



Compute and display the proportions directly

- Use `group_by()`, `summarize()`, and `mutate()` in a pipeline to compute then display the proportions directly
- Need to indicate we are displaying the `y` axis as given, i.e., the identity function

```
penguins |>
  group_by(species) |>
  summarize(count = n(), .groups = "drop") |>
  mutate(total = sum(count),
         prop = count / total) |>
  ggplot(aes(x = species)) +
  geom_bar(aes(y = prop), stat = "identity")
```

Useful to order categories by frequency with `forcats`

```
penguins |>
  group_by(species) |>
  summarize(count = n(), .groups = "drop") |>
  mutate(total = sum(count),
         prop = count / total,
         se = sqrt(prop * (1 - prop) / total),
         lower = prop - 2 * se,
         upper = prop + 2 * se,
         species = fct_reorder(species, prop)) |>
  ggplot(aes(x = species)) +
  geom_bar(aes(y = prop), stat = "identity") +
  geom_errorbar(aes(ymin = lower, ymax = upper),
                color = "red")
```

Useful to order categories by frequency with `forcats`