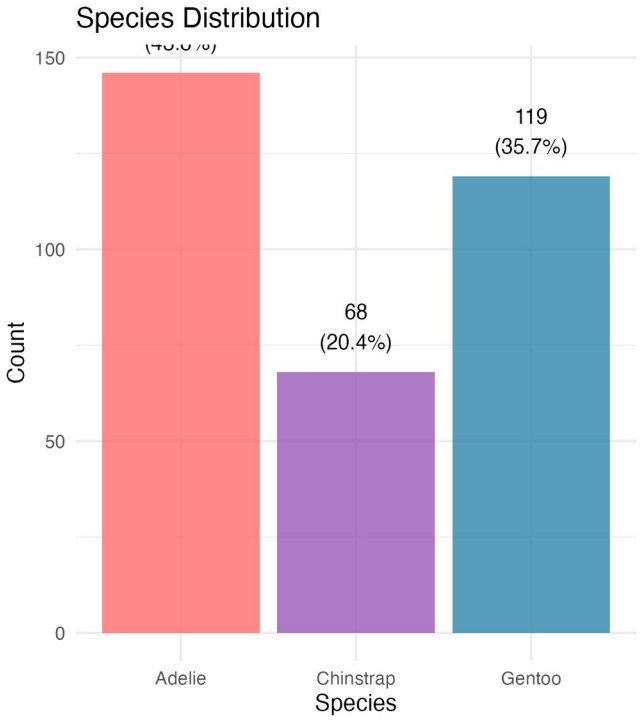
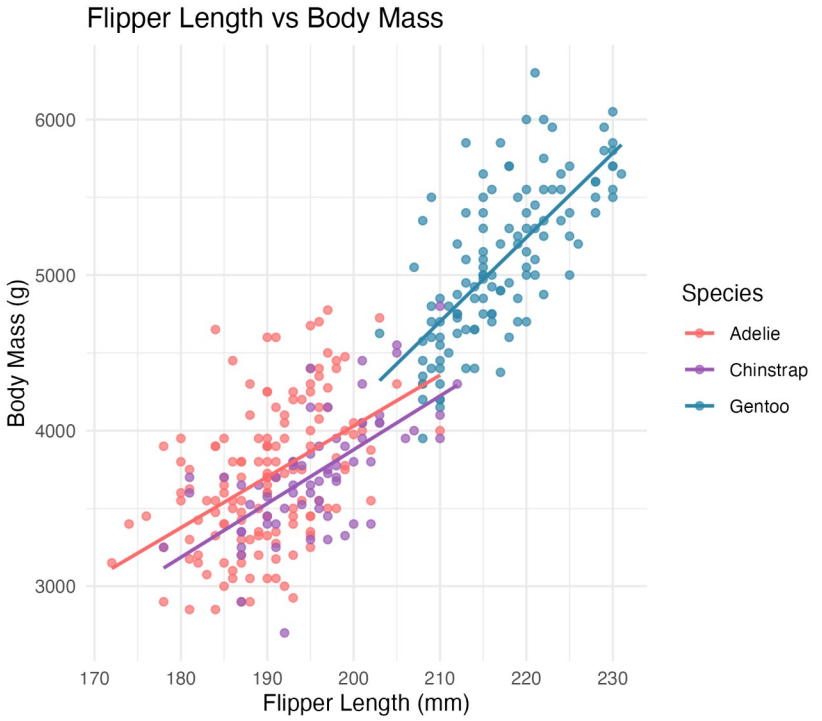
# Palmer Penguins Part 1

## Exploratory Data Analysis & Simple Regression

Can flipper length predict body mass?

# The Data: 333 Penguins, 3 Species

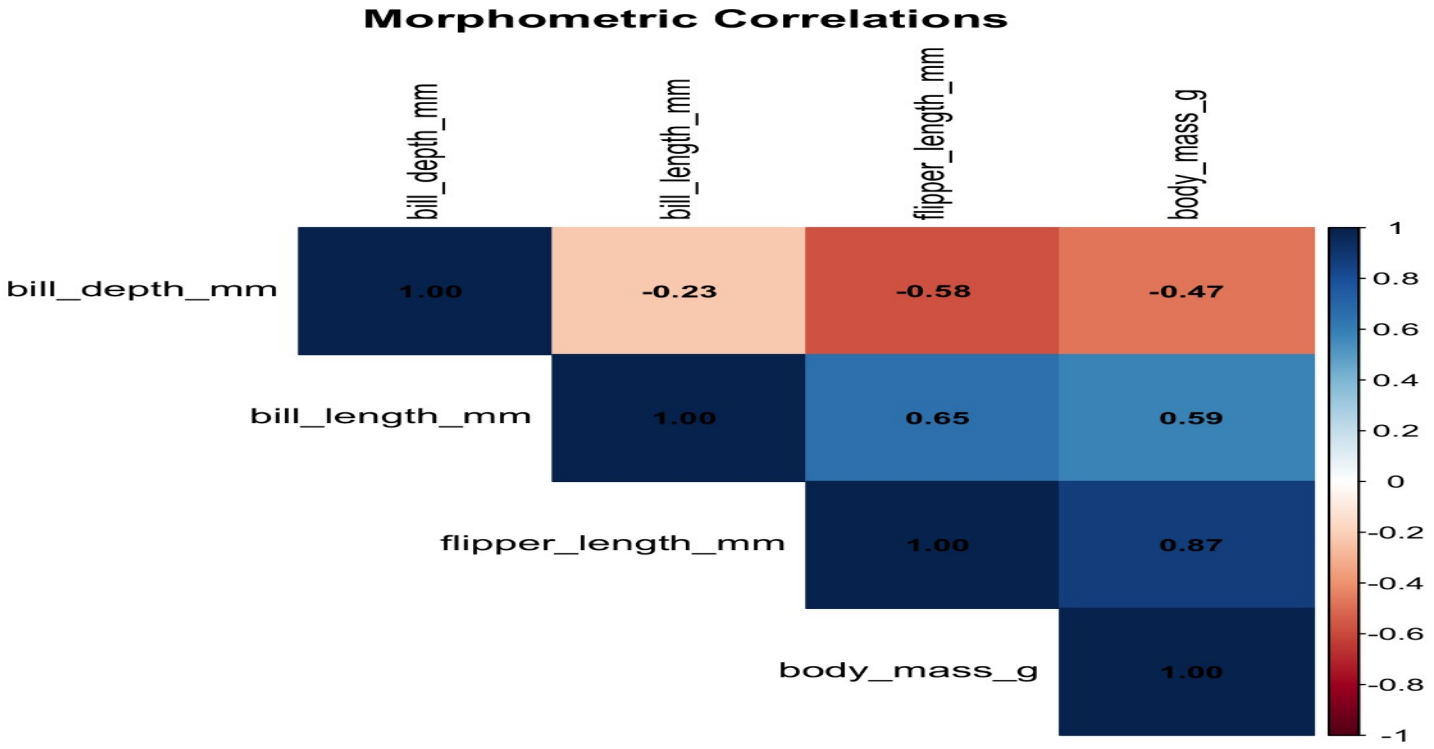



Adelie | Chinstrap | Gentoo

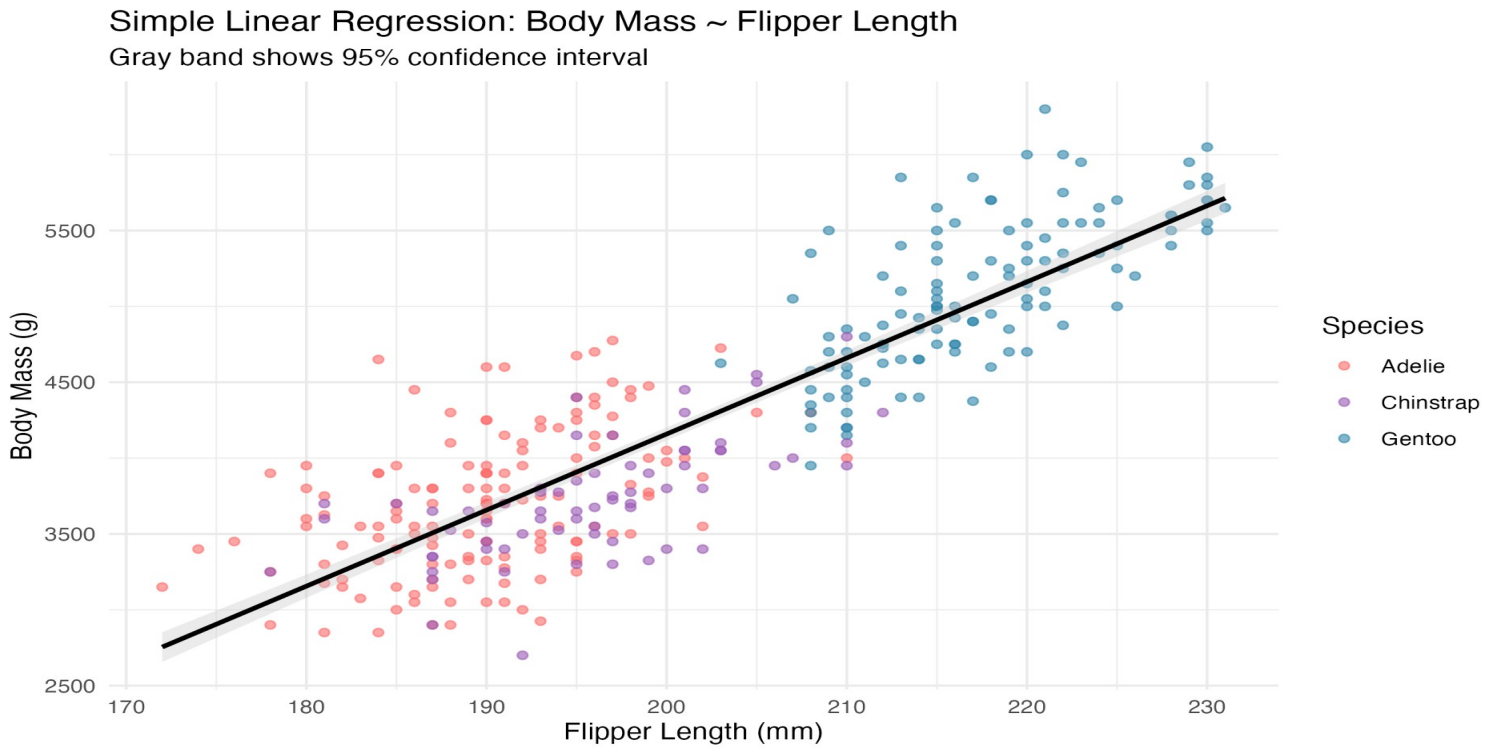
Correlation: r = 0.87

Strong relationship between flipper length and body mass



# Simple Linear Regression

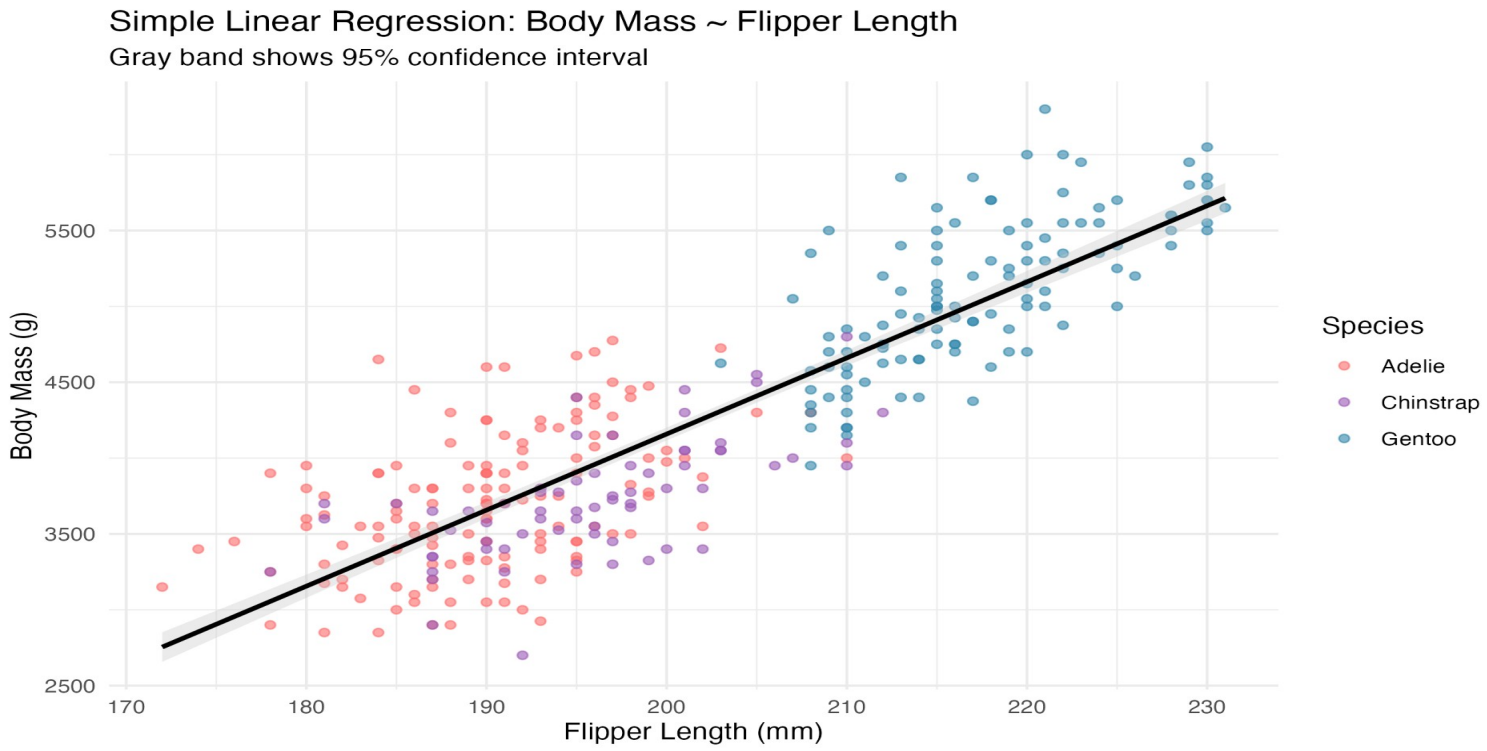
Body Mass = -5,781 + 49.7 × Flipper Length




$R^2 = 0.762$

# Making Predictions

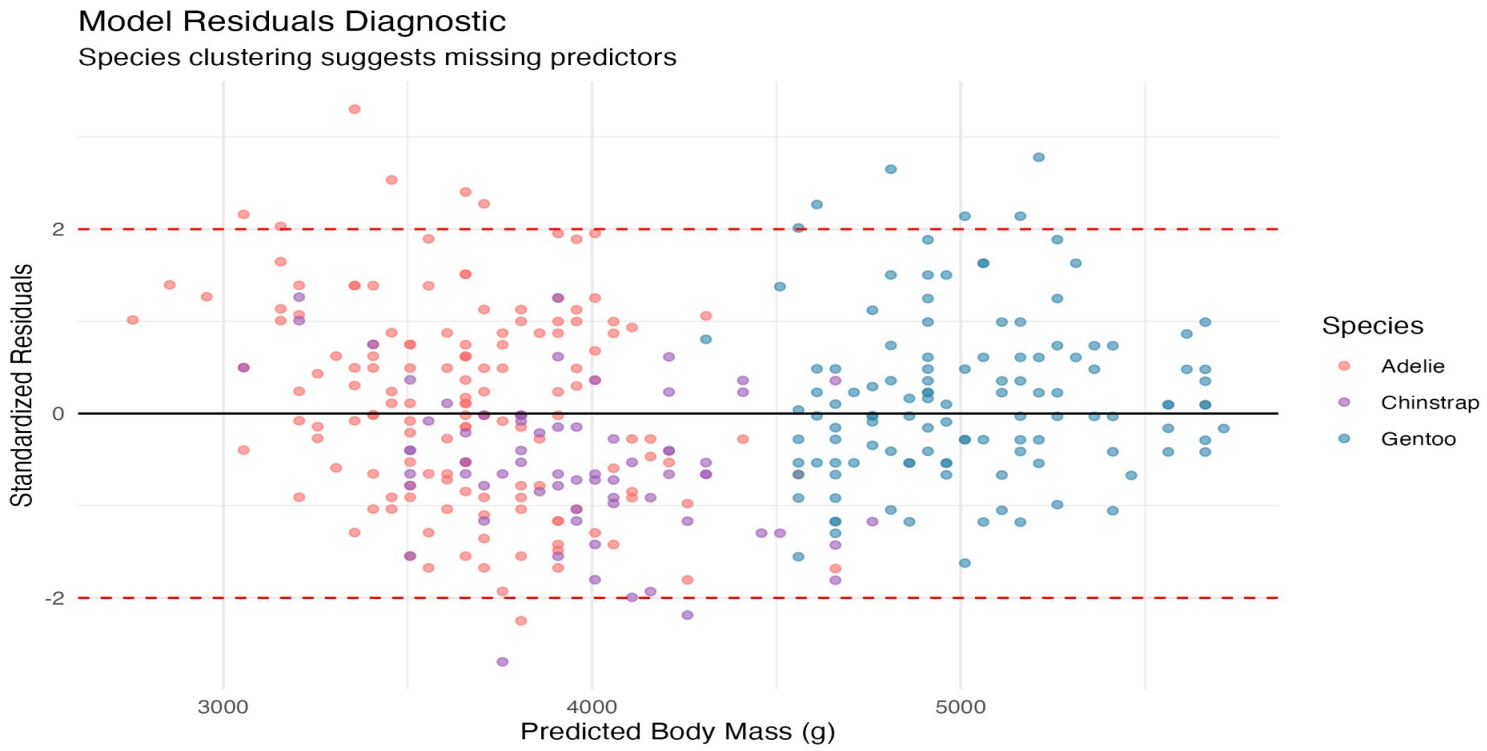
200mm flipper → ~4,100g body mass




Every 1mm of flipper ≈ 50g of body mass

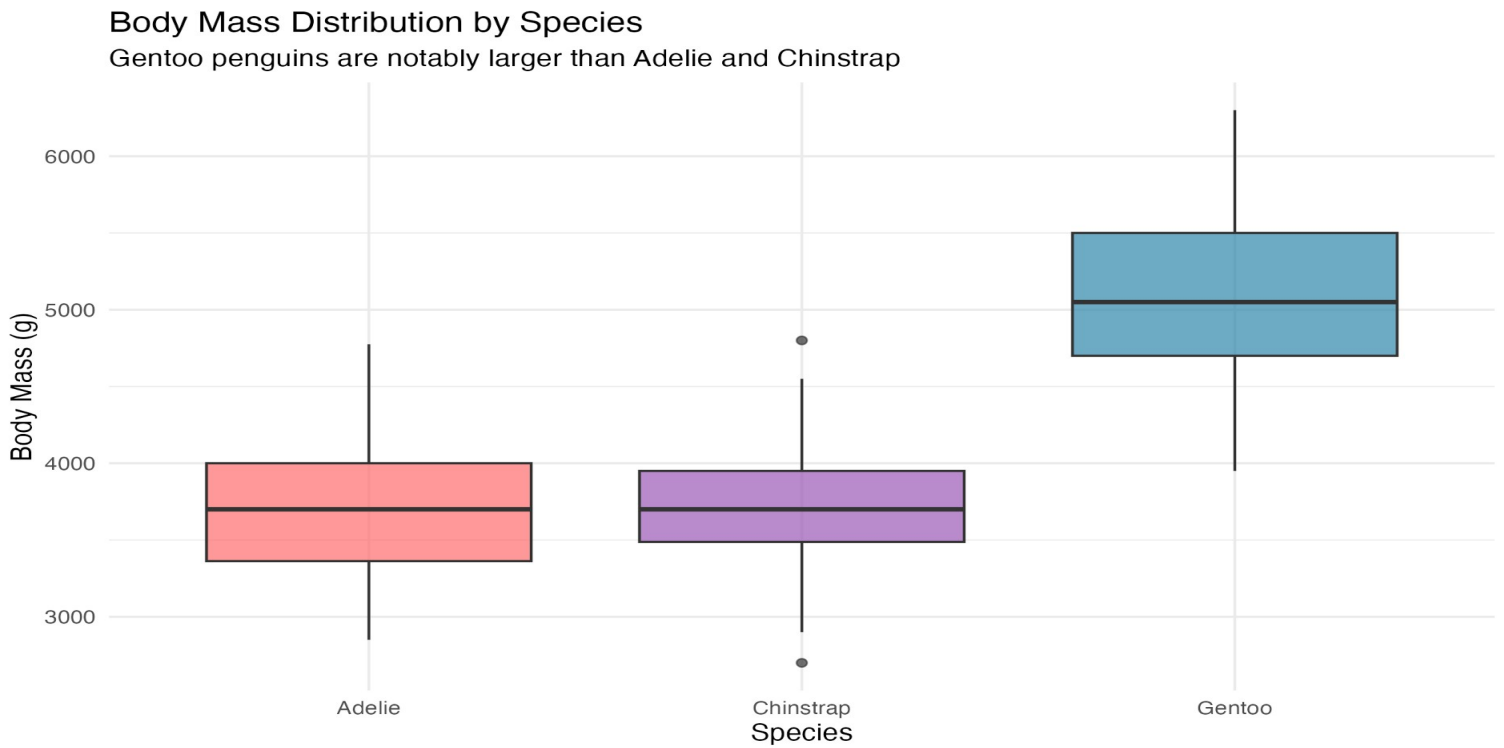
# The Problem: Species Clustering

## Residuals reveal what the model misses




## Species matters!

# Key Takeaways




76% variance explained, but species differences remain

Next: Part 2

Adding species to the model

$R^2$ jumps from 0.76 → 0.86+