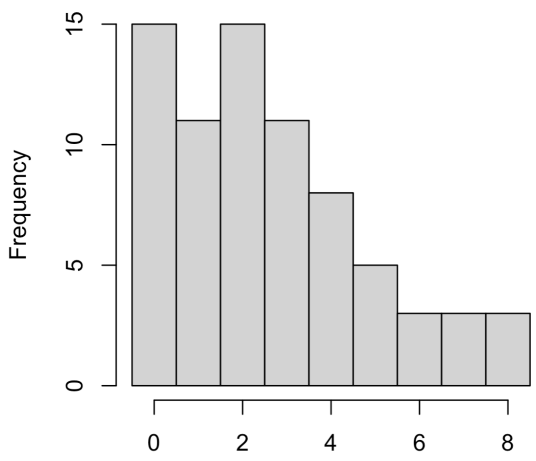
Chapter 3 Exam Prep: Visualizing Data

Statypus Insight: Learning to See

On the exam, you won't be drawing histograms from scratch. You will be handed a completed graph and asked to extract the "story" the data is telling. This requires you to look past the bars and see the patterns.

Raw Exam Output:
We all know that fruit is good for us. Many of us don't eat enough. The figure below is a histogram of the number of servings of fruit per day claimed by 74 seventeen-year-old girls in a study in Pennsylvania.



1A. What percent of these girls ate six or more servings per day?

1B. How many of these girls ate fewer than two servings per day?

Bill the Statypus says: Structural Rigor check! When you look at the center, don't just pick a random bar. Find the "balancing point" of the graph. For the spread, identify the minimum and maximum possible values based on the axis.

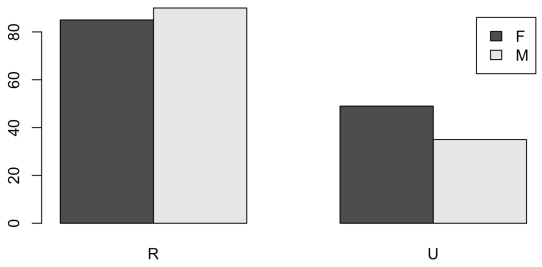
Sally the Statypus says: Vocabulary Alert! Use the Statypus Standards. Is it unimodal or bimodal? Is it symmetric or skewed? If you see a "tail" stretching toward the higher weights, what does that tell you about the skewness?

Your Turn (Draft your answers here):

CHAPTER 3

Raw Exam Output:

A researcher is studying the impact of river dams on platypus populations. The following side-by-side bar plot was generated in R to compare the distribution of `Sex` across `Regulated` and `Unregulated` rivers.



Exam Question 3:
Based on the side-by-side bar plot above, does there appear to be a relationship between river regulation and the sex ratio of the platypus population? Justify your answer by comparing the bars.

Bill the Statypus says: Don't get lost! The x-axis tells you the river type, and the individual bars within those groups show you the counts for each sex. To see a "relationship," you are looking for a change in the *balance* of the bars as you move from one river type to the other.

Sally the Statypus says: The exam is asking if the distribution of one variable appears to *depend* on the other. If the bars in the "Regulated" group look roughly equal, but the bars in the "Unregulated" group show a clear majority for one sex, that is your evidence for a relationship!

Your Turn (Write your justification in complete sentences):

Raw Exam Question:
Below is a stem-and-leaf plot of the number of eggs found in 20 different platypus nests.

```
1 | 2 2 3 5
2 | 0 1 1 1 4 6 8 9
3 | 2 2 4 5 7
4 | 1 3 8
Key: 1 | 2 = 12 eggs
```

Exam Question 2: A) How many nests contained exactly 21 eggs?
B) What was the maximum number of eggs found in a single nest?
C) Describe the shape of this distribution.

Bill the Statypus says: Read the Key! If the key said "1 | 2 = 1.2 eggs," your answers would be completely different. Always anchor your extraction in the units provided.

Sally the Statypus says: Don't be fooled by the vertical orientation! If you tilt your head to the right, a stem-and-leaf plot is just a histogram made out of numbers. The "long" rows of leaves are your tallest bars.

Your Turn (Answer A, B, and C):

Seneca the Statypus: The Power of the Tail

In the world of graphs, the tail is the rudder. It directs the mean and reveals the underlying bias of the data. To master Chapter 3 is to learn how to see where the data is being pulled, and why.