Types of Data

1. A class survey asked each respondent to report the following information: gender; birth date; SAT score; undergraduate major; time spent studying per week; interest level in the course; number of pairs of shoes; cups of coffee consumed per week; number of websites visited per day; and political party.

   (a) Which of the variables measured by the survey are categorical/qualitative?

   (b) Which of the variables measured by the survey are numerical/quantitative?

2. What type of variable is the answer to the phone prompt "Enter '1' for English, '2' for Spanish."? Why?

3. Each Yelp restaurant includes a star rating (1–5). What type of variable is the star rating?
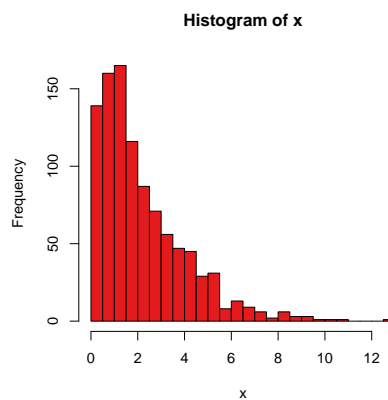
Measures of Central Tendency

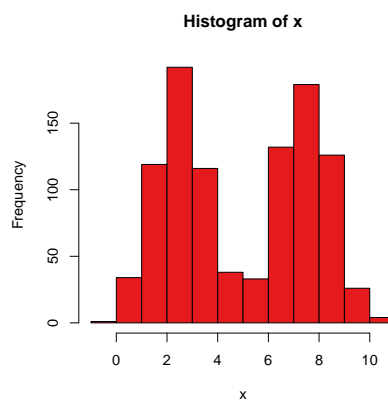4. Here are some histograms. Estimate the mean and median of the data.

    (a) Symmetric and mound-shaped data.

    Histogram of x

    (b) Skewed data.

    Histogram of x

    (c) Bimodal data.

    Histogram of x
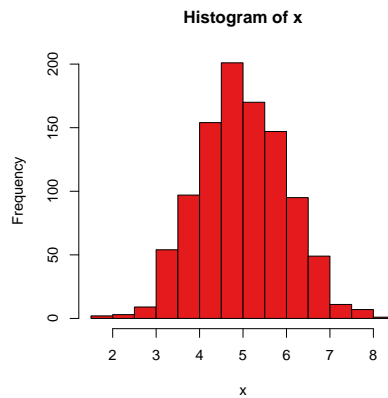
5. For the examples (a)–(c) of the previous problem, which is appropriate, the mean or the median?

Standard Deviation and The Empirical Rule

6. Forty-three respondents to a Stern MBA class survey reported their GMAT scores. The mean score was 710, and the standard deviation was 35. What can you say about the range of scores reported? Assume that the distribution of reported scores is symmetric and mound-shaped.

7. Forty-seven respondents from a Stern MBA class survey reported their expected starting salaries. The mean reported expected starting salary was $120K$ and the standard deviation was $25K$.

   (a) Complete the following statement with appropriate values for X and Y: "Approximately 95% of the survey respondents have expected starting salaries between X and Y."

   (b) What assumptions do you need to make for the statement in (a) to be correct? Do you think these assumptions are plausible? How could you check this?

   (c) What can we do if the assumptions needed in part (b) are not satisfied?

z-scores

8. Your company has an annual profit of $60MM with a standard deviation of $5MM. Assume that the distribution of your annual profits is symmetric and mound-shaped.

   (a) Would it be unusual for your company to have an annual profit of $52MM?

   (b) Would it be unusual for your company to have an annual profit of $83MM?

9. Forty-seven respondents from a Stern MBA class survey reported their expected starting salaries. The histogram of these responses was approximately bell-shaped. The mean and standard deviation (in $1K/year) was $\bar{x} = 120$ and $s = 25$. How many standard deviations above or below the mean are the following values?

   (a) A starting salary of $200K.

   (b) A starting salary of $100K.

   (c) A starting salary of $170K.

10. In the previous problem, which of the values are unusual?