

Exploring Data with Graphs and Numerical Summaries | 2

2.2 Describe Data Using Graphical Summaries

Aug 8-9:13 AM

### Learning Objectives

- Understand distributions
- Graph categorical data: bar graphs and pie charts
- Graph quantitative data: dot plot, stem-leaf, and histogram
- Construct histograms
- Interpret histograms
- Display data over time: time plots

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### Distribution

- Tells possible values of data as well as the occurrence of those values (frequency or relative frequency)
- Represented in
  - Tables
  - Graphs or Charts

Grade	Percent Score	Raw Score	Frequency	Percent
A	90.00 - 100.00	87.50 - 100.00	1	5.00
B	80.00 - 89.99	80.00 - 87.50	7	35.00
C	70.00 - 79.99	62.50 - 79.99	4	20.00
D	60.00 - 69.99	45.00 - 62.50	4	20.00
F	0.00 - 59.99	0.00 - 44.99	2	10.00

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### Graphs for Categorical Variables

Use pie charts and bar graphs to summarize categorical variables

- **Pie Chart:** A circle having a "slice of pie" for each category
- **Bar Graph:** A graph that displays a vertical bar for each category

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### Pie Charts

- Summarize categorical variable
- Drawn as circle where each category is a slice
- The size of each slice is proportional to the percentage in that category

Source	U.S. Percentage
Coal	51
Hydropower	6
Natural gas	16
Nuclear	21
Petroleum	3
Other	3
Total	100

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### Bar Graphs

- Summarizes categorical variable
- Bar height represents counts or percentages
- Easier to compare categories with bar graph than with pie chart
- Called **Pareto Charts** when ordered from tallest to shortest

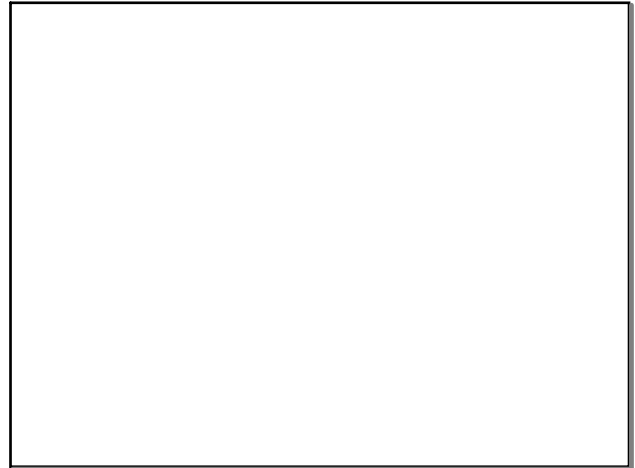
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- 2.12 **France is most popular holiday spot:** Which countries are most frequently visited by tourists from other countries? The table shows results according to *Travel and Leisure* magazine (2005).
- a. Is country visited a categorical or a quantitative variable?
  - b. In creating a bar graph of these data, would it be most sensible to list the countries alphabetically, or in the form of a Pareto chart? Explain.
  - c. Does either a dot plot or stem-and-leaf plot make sense for these data? Explain.

Most Visited Countries, 2005	
Country	Number of Visits (millions)
France	77.0
China	53.4
Spain	51.8
United States	41.9
Italy	39.8
United Kingdom	24.2
Canada	20.1
Mexico	19.7

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