EXPLORING, DISPLAYING, AND EXAMINING DATA
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Types of Data Analysis

• Exploratory data analysis
  – the data guide the choice of analysis--or a revision of the planned analysis

• Confirmatory data analysis
  – closer to classical statistical inference in its use of significance and confidence
  – may use information from a closely related data set or by validating findings through the gathering and analyzing of new data
Techniques to Display and Examine Distributions

- Frequency Table
- Visual Displays
  - Histograms
  - Stem-and-leaf display
  - Box-plot
- Crosstabulation of Variables
Techniques to Display and Examine Distributions

- Histograms
  - Display all intervals in a distribution, even without observed values
  - Examine the shape of the distribution for skewness, kurtosis, and the modal pattern
Techniques to Display and Examine Distributions (cont.)

• **Box-plot (box and whisker-plot)**
  – Rectangular plot encompasses 50% of the data values
    • Edges of the box (hinges)
  – Center line through the width of the box marks the median
  – Whiskers extend from the right and left hinges to the largest and smallest values
• Transformation
  – To improve interpretation and compatibility with other data sets
  – To enhance symmetry and stabilize spread
  – To improve linear relationships between and among variables
Improvement & Control Analysis

• Statistical process control
  – Uses statistical tools to analyze, monitor, and improve process performance
  – Total Quality Management
  – Control chart
    • Displays sequential measurements of a process together with a center line and control limits
      – Upper control limit
      – Lower control limit
Types of Control Charts

• Variables data
  (ratio or interval measurements)
  – X-bar
  – R-charts
  – s-charts
  – Pareto Diagrams
    • Bar chart whose percentages sum to 100 percent