

MISSOURI S&T MISSOURI UNIVERSITY OF SCIENCE AND TECHNOLOGY

Chapter 1

Descriptive Statistics

- 1.1 Populations, Samples, and Processes
- 1.2 Pictorial and Tabular Methods in Descriptive Statistics**
- 1.3 Measures of Location
- 1.4 Measures of Variability

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8

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Stem-and-Leaf Displays

1. Select one or more leading digits for the stem values. The trailing digits become the leaves.
2. List possible stem values in a vertical column.
3. Record the leaf for every observation beside the corresponding stem value.
4. Indicate the units for stems and leaves someplace in the display.

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9

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Example

US beer production (in millions of barrels) for different quarters during 1975 – 1982:

32, 47, 48, 34, 35, 46, 47, 33, 37, 51, 49, 33, 40, 52, 51, 39, 42, 56, 55, 43, 45, 57, 57, 43, 45, 58, 57, 44, 49, 56, 54, 50.

Draw a **stem-and-leaf display** and a **dotplot**.

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10

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Numerical Data Sets (Discrete)

- **(absolute) frequency**: number of times that value occurs in the data set
- **relative frequency**: (number of times value occurs) over (number of observations in the data set)
- **percentage**: relative frequency times 100
- **frequency distribution**: tabulation of frequencies

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11

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Histogram for Discrete Data

1. Determine the frequency and relative frequency for each value.
2. Mark possible values on a horizontal scale.
3. Above each value, draw a rectangle whose height is the relative frequency of that value.

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12

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Example

In 50 families we determine the number of children per family.

12 with no child, 17 with one child, 9 with two children, 6 with three children, 4 with four children, 2 with five children.

Draw a **histogram**.

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13

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Histogram for Continuous Data: Equal Class Widths

1. Determine the frequency and relative frequency for each class.
2. Mark the class boundaries on a horizontal measurement axis.
3. Above each class interval, draw a rectangle whose height is the corresponding relative frequency.

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14

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Example

Lifetimes (in hours) of 50 power units of the same type are measured in classes with borders 0, 200, 400, 600, 800, 1000, 1200, 1400.

Frequencies: 8, 10, 10, 4, 6, 11, 1.

Draw a histogram.

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15

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Histogram for Continuous Data: Unequal Class Widths

1. Determine the frequency and relative frequency for each class.
2. Mark the class boundaries on a horizontal measurement axis.
3. Above each class interval, draw a rectangle whose height is the relative frequency of the class divided by the class width (= density).

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16

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Example

Lifetimes (in hours) of 50 power units of the same type are measured in classes with borders 0, 200, 400, 600, 1000, 1400.

Frequencies are the same as in the previous example.

Draw a histogram.

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17

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Shapes of Histograms

- symmetric unimodal
- bimodal
- positively skewed
- negatively skewed

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18