

MAT 142: College Mathematics

Lecture Notes: Chapter 15 (Part 1)

15.1: Organizing and Visualizing Data

Definitions:

- 1. Statistics**
- 2. Data**
- 3. Population**
- 4. Sample**
- 5. Bias**

Frequency Distribution

Example: The principal of a grade school has asked the faculty members to report how many students in each of their classes has called in sick due to a recent flu outbreak. The data is listed below:

4, 10, 12, 9, 10, 4, 1, 8, 9, 14, 4, 11, 13, 9, 15, 3, 5, 8, 11, 10, 7, 8, 6, 12

A. Table

B. Histogram (Bar Graph)

C. Stem and Leaf Diagram

Example: The following are the number of home runs hit by the home run champions in the National League for the years 1975 to 1989 and for 1990 to 2004.

1975 – 1989: 38, 38, 52, 40, 48, 48, 31, 37, 40, 36, 37, 37, 49, 39, 47

1990 – 2004: 40, 38, 35, 46, 43, 40, 47, 49, 70, 65, 50, 73, 49, 47, 48

Compare these home run records using both simple and double stem and leaf displays.

15.2: Measures of Central Tendency

A. Mean, Median and Mode

Mean:

Median:

Mode:

Example: A sample of college students were asked how many vehicles their immediate family owned. They reported the numbers below:

1, 18, 4, 3, 3, 4, 1, 2, 2, 2, 4, 1, 3, 2, 3

Find the mean, median and mode of the data – choose the “best” measure of center and explain why it was chosen.

Example: Assume that your Psychology class grade is based solely on your exam score average. You currently have the following scores: 84, 91, 67, and 77. You would like to earn a B (80% or better) in the course, so what score do you need on the last exam?

B. Five Number Summary and Box-and-Whisker Plots:

Minimum:

Maximum:

Median:

First Quartile:

Third Quartile:

Example: The following are the number of home runs hit by the home run champions in the National League for the years 1975 to 1989 and for 1990 to 2004.

1975 – 1989: 38, 38, 52, 40, 48, 48, 31, 37, 40, 36, 37, 37, 49, 39, 47

1990 – 2004: 40, 38, 35, 46, 43, 40, 47, 49, 70, 65, 50, 73, 49, 47, 48

Create a box-and-whisker plot for each group of years and compare them.

Are there any outliers? 1.5 IQR Criterion

15.3: Measures of Dispersion

Range:

Deviation from the Mean:

Standard Deviation:

Variance:

Coefficient of Variation:

Example: The table below gives the annual incomes for eight families, in thousands of dollars. Find the measures of dispersion and find the standard deviation.

Family	A	B	C	D	E	F	G	H
Income (in thousands)	47	48	50	49	51	35	44	63

Range:

Mean:

Standard Deviation and Variance:

Number	Deviation from Mean	Deviation Squared
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Example: The table below gives the ages of 16 World War II veterans who are attending a reunion commemorating the Normandy invasion. Find the mean and standard deviation for this data.

Age	82	83	84	86	93	95
Frequency	4	2	4	2	3	1

Mean:

Standard Deviation and Variance:

Age **Deviation from Mean** **Deviation Squared**