Unit 1 Day 2:
Freq. Distr./Graphs/Data Descriptions
(3-1) Measures of Central Tendency,
(2-3) Dot Plots
(2-3) Stem and Leaf Plots
(2-1) Grouped Frequency Distribution,
(2-2) Histogram

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Measures of Central Tendency: averages that tell about the middle of the numbers.

1. **MEAN** (a.k.a. arithmetic average) add up all the data values and divide by the number of data values.

notation: $\bar{X}$ or μ (Greek letter mu)
↑ Sample ↑ population

Rounding Rule: $\bar{X}$ should be rounded 1 decimal further than the data.

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2. **Median**: the midpoint of the data
How to find:
a. Arrange the data in order
b. Select middle
*If 2 numbers are in the middle take the average of those 2.

3. **The Mode**: the value that occurs most often.
*If no data occurs more often than any other, then the data has no mode. There can be more than one mode.

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Example: The following data represents the # of days off per year for a sample of individuals selected from 10 countries. Find the mean, median, and mode.

20, 26, 40, 36, 23, 42, 35, 24, 30, 24

20, 23, 24, 24, 26, 30, 35, 36, 40, 42

$\bar{X} = \frac{300}{10} = 30.0$

$\text{median} = \frac{26+30}{2} = 28$

mode = 24

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An extremely high or extremely low value can have an effect on the mean of the data. These extreme values are called **outliers**. In the cases when data has such values, usually the median is a better method to use.

EX: find mean, median, mode.

Staff Salary
Owner $50,000
Manager $20,000
Salesperson $12,000
Technician $9,000
Technician $9,000

$\bar{X} = 20,000$
median = 12,000
mode = 9,000

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Dotplot- graph in which the data value is plotted as a point above the horizontal axis

*Dotplots are used to show how the data is distributed and to see if there are any extremely high or low data values.

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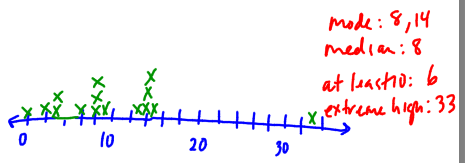
Example

The data show the number of homeruns for 15 of the cardinals players. Construct and analyze a dotplot for the data.

15, 14, 8, 13, 33, 14, 14, 8, 9, 8, 6, 3, 2, 3, 0



*Questions on note sheet

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III. Stem and Leaf

A **stem and leaf plot** is a data plot that uses part of the data value as the stem and part of the data value as the leaf to form groups or classes.

Stem-and-leaf plots are a method for showing the frequency with which certain classes of values occur.

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II. Stem and Leaf

Example

EX: Outpatient Cardiograms

At an outpatient testing center the number of cardiograms performed each day for 20 days is shown

25	31	20	32	13	14	43
57	23	36	32	33	32	44
52	44	51	45	32	02	

Step 1. Arrange the data in order:

mode: 32
median: 32.5
$\bar{x}$ = 35.4

Stem	Leaf
1	3 4 7
2	5
3	0 1 2 2 2 3 6
4	3 4 4 4 5
5	1 2 7

Step 2: Group the data bas the first digit. Write the f digits under "Stem"

Step 3: Plot the second number as the leaf (in order). You must represent every number, even the ones that repeat

*Questions on notesheet

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Grouped Frequency Distribution: a distribution used when the range of data is large.

Steps to create grouped frequency distribution:

1.) a. Determine the classes (usually given)
b. Find the high (H) and low (L) value
c. Find the range (H - L)
d. Find the width (R/# of classes) (round-up)
e. Select starting point. (usually lowest value)
f. Add width to the starting point to create next class. Repeat for the number of classes.
2.) Tally the info.
3.) Count the tallies (frequency)
4.) Find the cumulative frequency

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Example

The following data are the measured speeds in miles per hour of 30 charging elephants. Use 5 classes.

25 24 25 24 25 23 25 19 32 23
22 24 26 25 23 28 25 25 26 27
22 28 24 23 24 21 25 22 29 23

Grouped Frequency:

Class	Class boundaries	Tally	Frequency	Cumulative Frequency
19-21	18.5-21.5	II	2	2
22-24	21.5-24.5	𝍸 𝍸 III	13	15
25-27	24.5-27.5	𝍸 𝍸 I	11	26
28-30	27.5-30.5	III	3	29
31-33	30.5-33.5	I	1	30

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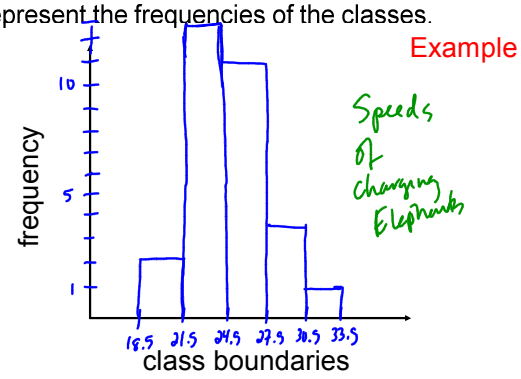
Histogram: graph that displays the data by using contiguous vertical bars of various heights to represent the frequencies of the classes.

Example



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Assignment:
WS Measures of central tendency, dot plots, stem and leaf plots

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