

1.8 Measures of Central Tendency

Necessary Definitions:

- Mean**
- the average
 - add the data values, then divide by the # of data values
- Median**
- the middle value of the data
 - order the data from smallest to largest then choose the one in the middle
 - if there are 2 values in the middle, take their average
- Mode**
- the value that occurs most often
 - there can be more than one (a tie!!)

Mar 2-11:39 AM

Think about.... (Don't Copy)

Two car salesman are competing for a mid-year bonus. The owner of the dealership wants to asses the better competitor. The data below shows the monthly sales for both. Who is the better salesman?

	16	26	28	28	31	32
Rahim	16	28	22	28	28	31
Johann	34	30	24	26	29	26
	24	26	26	29	30	34

- ★ - looking at the average...
 - Rahim's is $161/6 = 26.8$. He sells, on average, 26.8/month.
 - Johann's average is $169/6 = 28.2$.
 - By this calculation, Johann sells more cars a month.

- If you look more closely, Rahim is more likely to sell 28 cars in a month and Johann is more likely to sell 26 cars, because these are their middle number of sales.

- It is important to do many calculations before you make a conclusion. These are measures of central tendency....

Oct 12-7:30 PM

Ex 1: The average age of players on a baseball team is listed below.

~~22~~ ~~27~~ ~~41~~ ~~28~~ ~~33~~ ~~39~~ 22 27 55 31

a) Calculate the mean, median and mode of the data. Answer: ★

$22 + 27 + 41 + 28 + 33 + 39 + 22 + 27 + 55 + 31$
 total = 325
 mean = $\frac{\text{total}}{\text{number of players}}$
 $= \frac{325}{10}$
 $= 32.5$

Mean = 32.5
 Median = 29
 Mode = 22, 27

median
 22, 22, 27, 27, 28, 31, 33, 39, 41, 55
 $\hookrightarrow \frac{28+31}{2} = 29.5$

mode
 22, 27

b) Which measure of central tendency best describes the data?

Answer: ★ Median is best since there is an OUTLIER (55 year old) which is pulling/skewing the average up.

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Ex 2: The table below shows the responses from a survey about the # of siblings that someone has.

# of siblings	frequency
0	6
1	15
2	10
3	4
4	1

- a) How many people were surveyed? 36
 b) Determine the mean, median and modal interval.

mean = $\frac{\text{\# of Siblings} \times \text{frequency} + \text{\# of} \times \text{freq} \dots}{\text{total surveyed}}$
 $= \frac{6 \times 0 + 15 \times 1 + 10 \times 2 + 4 \times 3 + 1 \times 4}{36}$
 $= 1.4$

Median: 36 numbers,
 Need 18th & 19th
 both in "1 sibling"
 \therefore Median = 1

Mode: 1

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Ex 3: Jim collected donations for the local food bank and recorded the donations she received in the table below.

Donation (\$)	Frequency
[10-20)	36
[20-30)	6
[30-40)	2
[40-50)	1

a) How many people donated? 45

b) What is the median donation? $\frac{10-20}{2} \sim \$15$

c) What is the modal donation? $\frac{10-20}{2} \sim \$15$

d) What is the maximum possible range? $\frac{49.99-10}{1} = 39.99$

a) 45

b) lies at the 23rd position, therefore the median is \$10-20.

c) Modal donation is \$10-20.

d) \$40 (highest amount - lowest)

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SUMMARY:

All 3 measures of central tendency are good indicators of the trend in data, but sometimes one is a better choice than another to make a conclusion.

Mean - really good when the data is fairly close together.

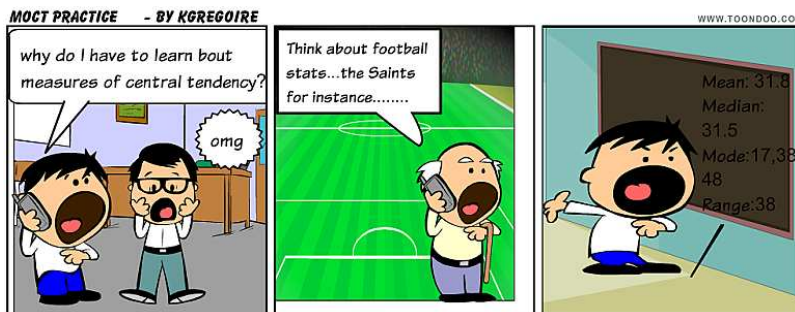
Median - good when there is an outlier (a number far away from the others)

Mode - good when the value of the # is the most important info (i.e. shoe size). Only choice with categorical data.

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Homework

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