3.1 Measures of Center

"AVERAGE" → MEAN

12, 10, 15, 8, 7

$\bar{x} = \frac{\Sigma x}{n}$

$= \frac{12+10+15+8+7}{5}$

$= \frac{52}{5}$

$\bar{x} = 10.4$

$ 230,000
175,000
225,000
250,000
230,000
1,450,000
$\Sigma x = 2,560,000$

$\bar{x} = \frac{\Sigma x}{n}$

$= \frac{2560000}{6}$

$\bar{x} \approx 426,666.67$?!

Extreme outliers can affect the mean!

THE MEDIAN "middle"

7, 8, 10, 12, 15

M = 10

$\tilde{x} = 10$

7, 8, 10, 12, 15, 16

$\frac{10+12}{2}$

11

M = 11

7, 8, 10, 12, 15, 452

M = 11

HOUSE PRICES

175000, 225000, 230000, 230000, 250000, 1450000

M = 230000

MODE = 230,000

MODE → "most"

No mode

MODE = BLUE

MIDRANGE → "middle of the range" or middle value between the min & Max

12, 10, 15, 8, 7

↑ Max ↑ min

$MR = \frac{\min + \max}{2}$

$= \frac{7 + 15}{2}$

$= \frac{22}{2}$

$MR = 11$

$\bar{x} = 10.2$

$M = 10$

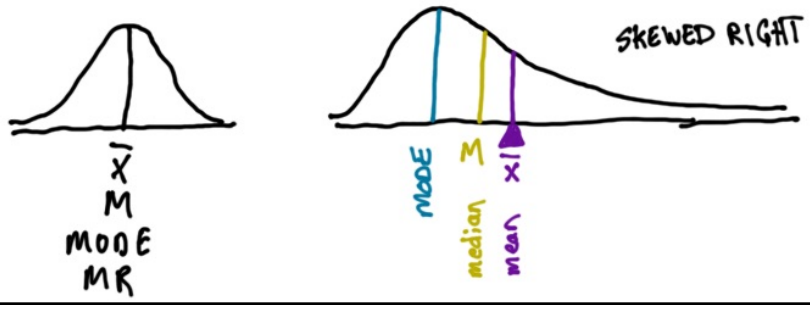
MODE = none

House Prices

$MR = \frac{175000 + 1950000}{2}$

$= \$812,500$ NOT TYPICAL!

LOCATION OF MEAN, MEDIAN, MODE, MIDRANGE



Example 2 Instead of having the raw data above, suppose we only had the summary data:

Score	f
20 – 24	1
25 – 29	1
30 – 34	2
35 – 39	5
40 – 44	8
45 – 49	6
50 – 54	2

Class mark	f
22	1
27	1
32	2
37	5
42	8
47	6
52	2

13th value

$MR = \frac{22 + 52}{2}$

$= 37$

Find the mean, median, and mode using the summary data and compare the values to example 1.

Mean

$\bar{x} = \frac{\Sigma cm \cdot f}{n}$

$= \frac{22 \cdot 1 + 27 \cdot 1 + 32 \cdot 2 + 37 \cdot 5 + 42 \cdot 8 + 47 \cdot 6 + 52 \cdot 2}{25}$

$= \frac{1020}{25}$

$\bar{x} = 40.8$

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$M = 42$

mode = 42

$MR = 37$