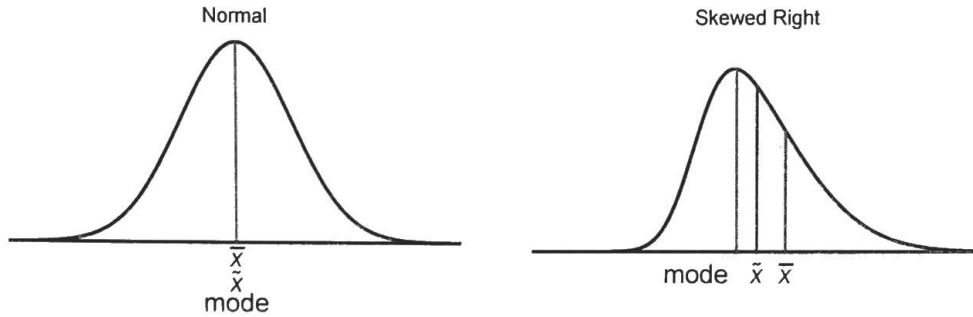


If we replace the 32 with 100 in the even n data set, {14, 17, 20, 26, 30, 100} the MR is 57, which is certainly NOT representative of a "typical" value.

Location of Mean, Median, Mode

If the data are symmetric and bell shaped, the mean, median and mode have the same value. For data that is skewed right, the mean is most affected by the extreme right values, then the median.



Example 1 Find the Mean, median, mode and midrange of the Exam 1 scores data set. Knowing the shape of the distribution, which measure of center is most representative of a typical score?

42 42 38 42 46 34 40 23 41 38
 39 46 50 49 45 46 36 52 34 43
 44 26 41 45 37

$\bar{x} = 40.76$
 $\tilde{x} = 42$
 mode = 42, 46

$$\bar{x} = \frac{\sum x}{n} = \frac{1019}{25} = 40.76$$

Since the distribution is skewed left, the mean may be pulled to the left too much. The median may be more appropriate.

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

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

Class Mark	f	am · f
22	1	22
27	1	27
32	2	64
37	5	185
42	8	336
47	6	282
52	2	104

$\Sigma = 1020$

$\bar{x} = \frac{1020}{25}$
 $\bar{x} = 40.8$ close to the raw data.

The mode is 42 with $n = 8$

The median is the 13th value which is in the class [40, 44], or the class mark of 42. So $\tilde{x} = 42$ is the best we can do.