Mean, Median and Mode
Practice Problems

3 — Central Tendency

3.1 Mean, Median and Mode

Definition 3.1 — Mean. The mean of a dataset is the numerical average and can be computed by dividing the sum of all the data points by the number of data points:

$$\bar{x} = \frac{\sum_{i=0}^{n} x_i}{n}$$

R The mean is heavily affected by outliers, therefore we say the mean is *not* a robust measurement.

Definition 3.2 — Median. The median of a dataset is the datapoint that is directly in the middle of the data set. If two numbers are in the middle then the median is the average of the two.

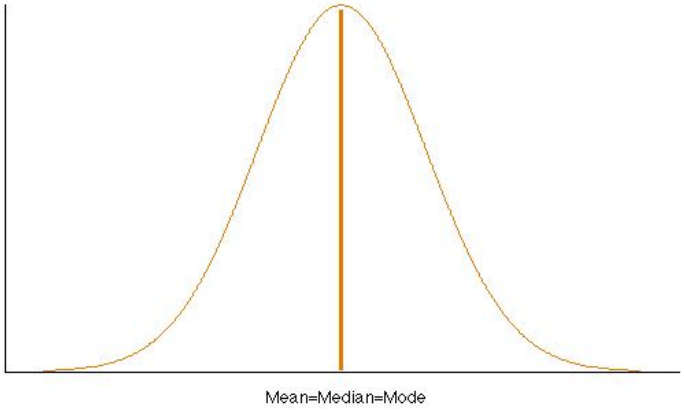
1. The data set is odd $n/2 =$ the position in the data set the middle value is
2. The data set is even $\frac{x_k + x_{k+1}}{n}$ gives the median for the two middle data points

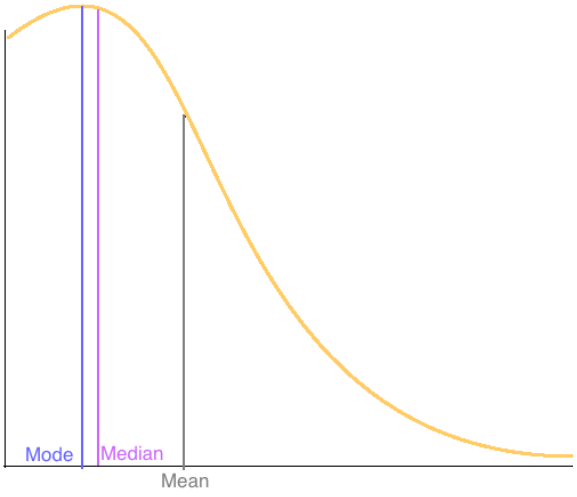
R The median is robust to outliers, therefore an outlier will not affect the value of the median.

Definition 3.3 — Mode. The mode of a dataset is the datapoint that occurs the most frequently in the data set.

R The mode is robust to outliers as well.

R In the normal distribution the mean = median = mode.





3.2 Practice Problems

Problem 3.1 Find the mean, median and mode of the data set

Problem 3.2 A secret club collects the following monthly income data from its members. Find the mean, median, and mode of these incomes. Which measure of center would best describe this distribution?

15	16	17
16	21	22
15	16	15
17	16	22
14	13	14
14	15	15
14	15	16
10	19	15
15	22	24
25	15	16

Table 3.1: Problem 1

$2500	$3000	$2900
$2650	$3225	$2700
$2740	$3000	$3400
$2500	$3100	$2700

Table 3.2: Incomes