Math-3A
Lesson 11-1

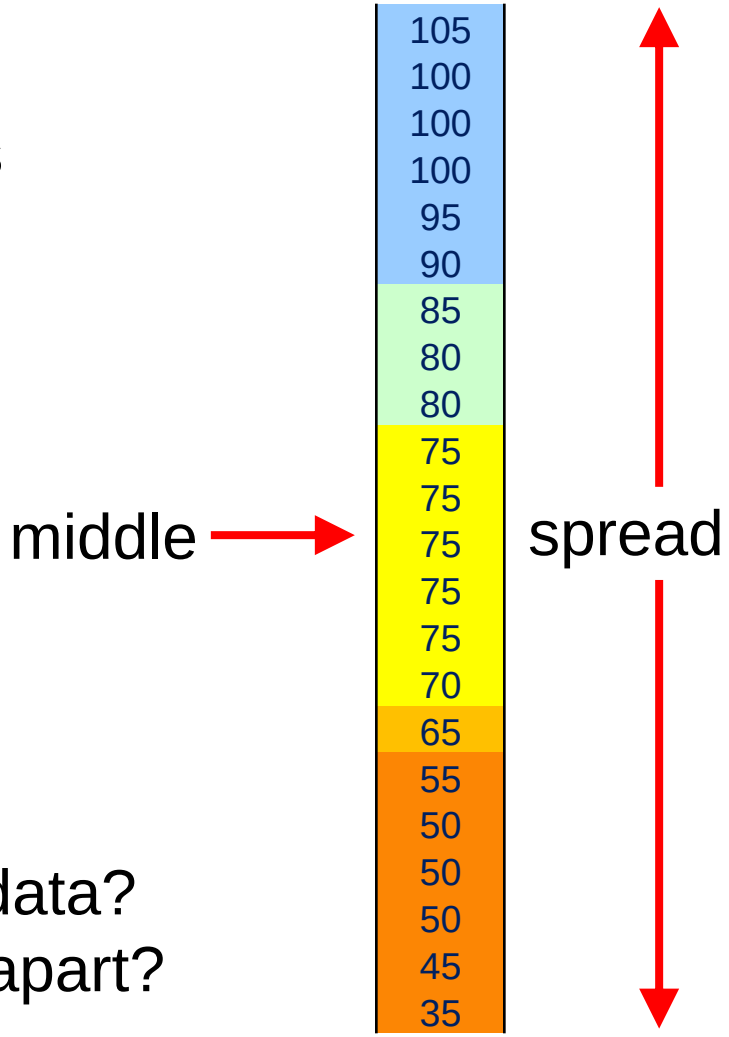
Statistics:
Measure of “Central Tendency”

Statistics: The numerical values used to summarize and compare sets of data.

Data: A collection of measurements of a certain type:

Examples:

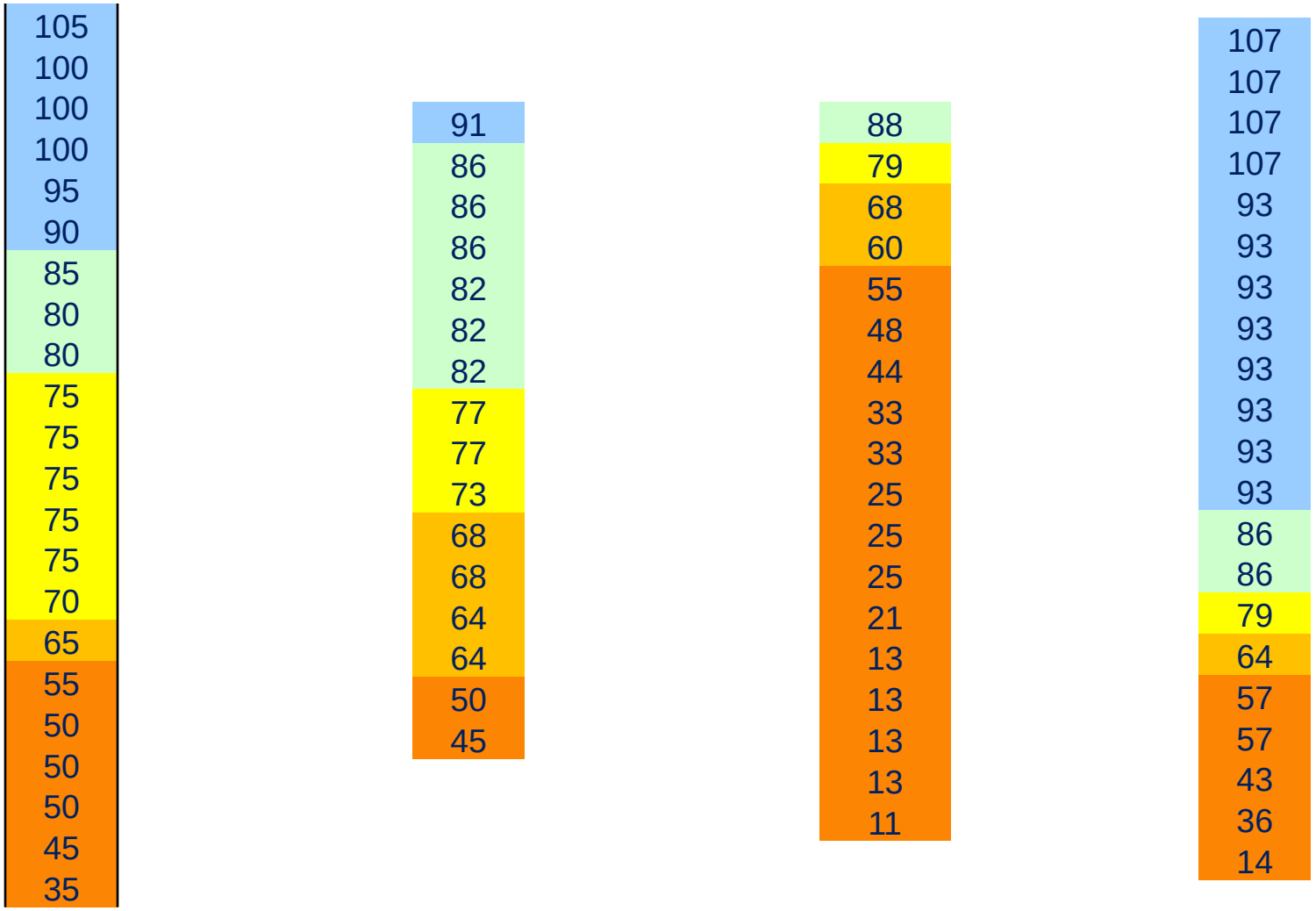
- Income
- Age
- Unit 6 Test Scores



Categories of Statistics:

- where is the middle of the data?
- how far is the data spread apart?

How can we find the “middle” of the data?



Measure of Central Tendency: a number used to represent the "center" or "middle" of the data set.

Mean is a measure of central tendency.

Mean: what you would normally call the "average".

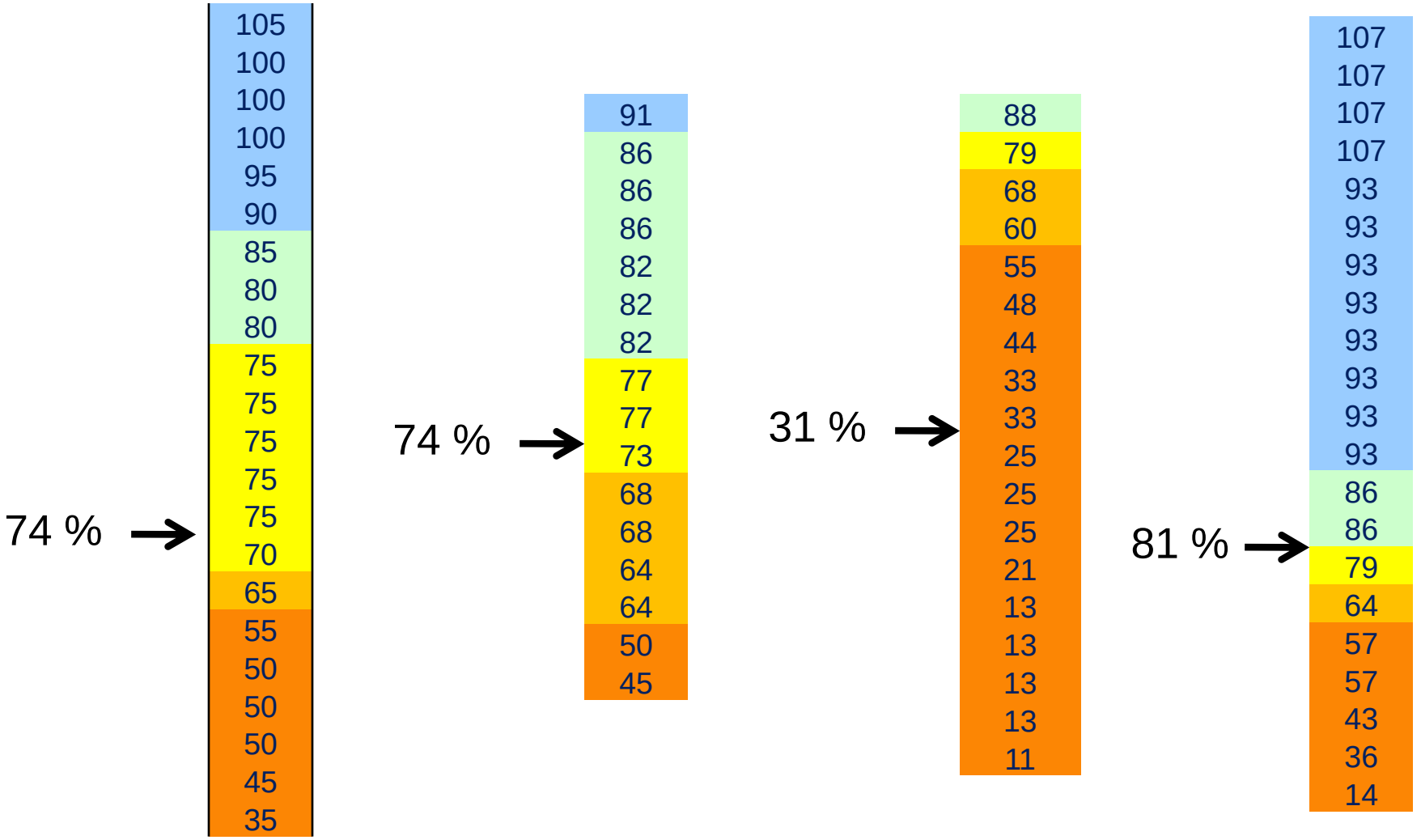
Add all the data together then divide by the number of data points.

$$Mean = \frac{x_1 + x_2 + \ldots + x_n}{n} \qquad \bar{x} = \frac{x_1 + x_2 + \ldots + x_n}{n}$$

"x-bar"

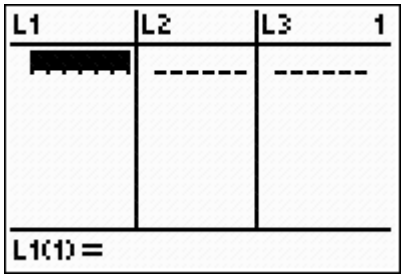
Grades for 4 different tests.

Mean (average) grade for each:

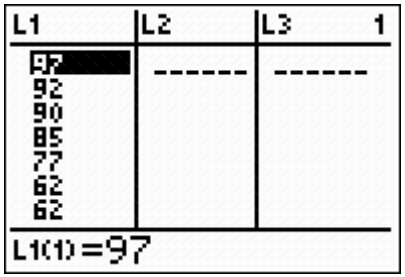


Let's use the calculator

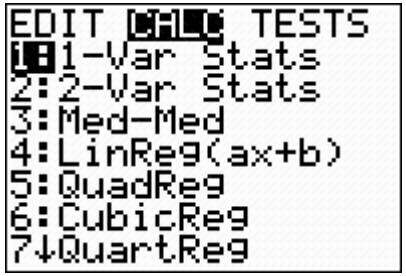
Enter the data into a list
→ "Stat" then "edit" option.



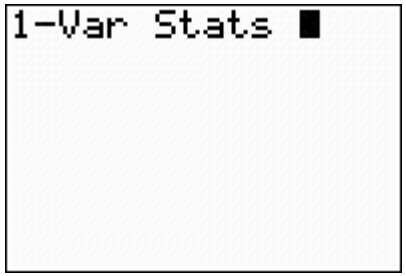
Enter the data into list "L1".



"stat" then scroll over to "calc"



Option 1: 1-var stats then "enter"

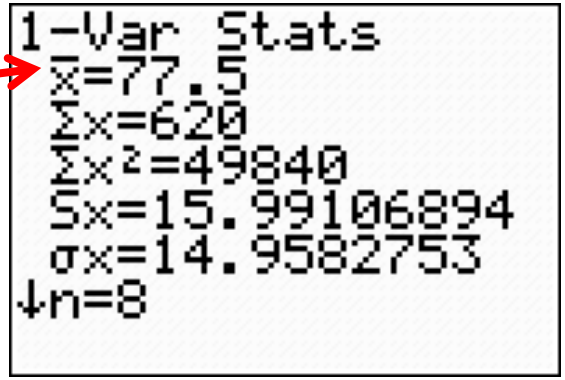


Find the mean of the following data.

{ 2, 3, 5, 7, 9, 11}

$$\bar{x} = \frac{2+3+5+7+9+11}{6} = 6.17$$

Mean:



Median: the number that is the middle number of the data set.

median: half of the data points are above this value and half are below this value.

Odd number of data: 4, 6, 8, 10, 12

Even number of data: 3, 4, 6, 8, 10, 12

For an even number of data, take the mean of the numbers above and below the middle position.

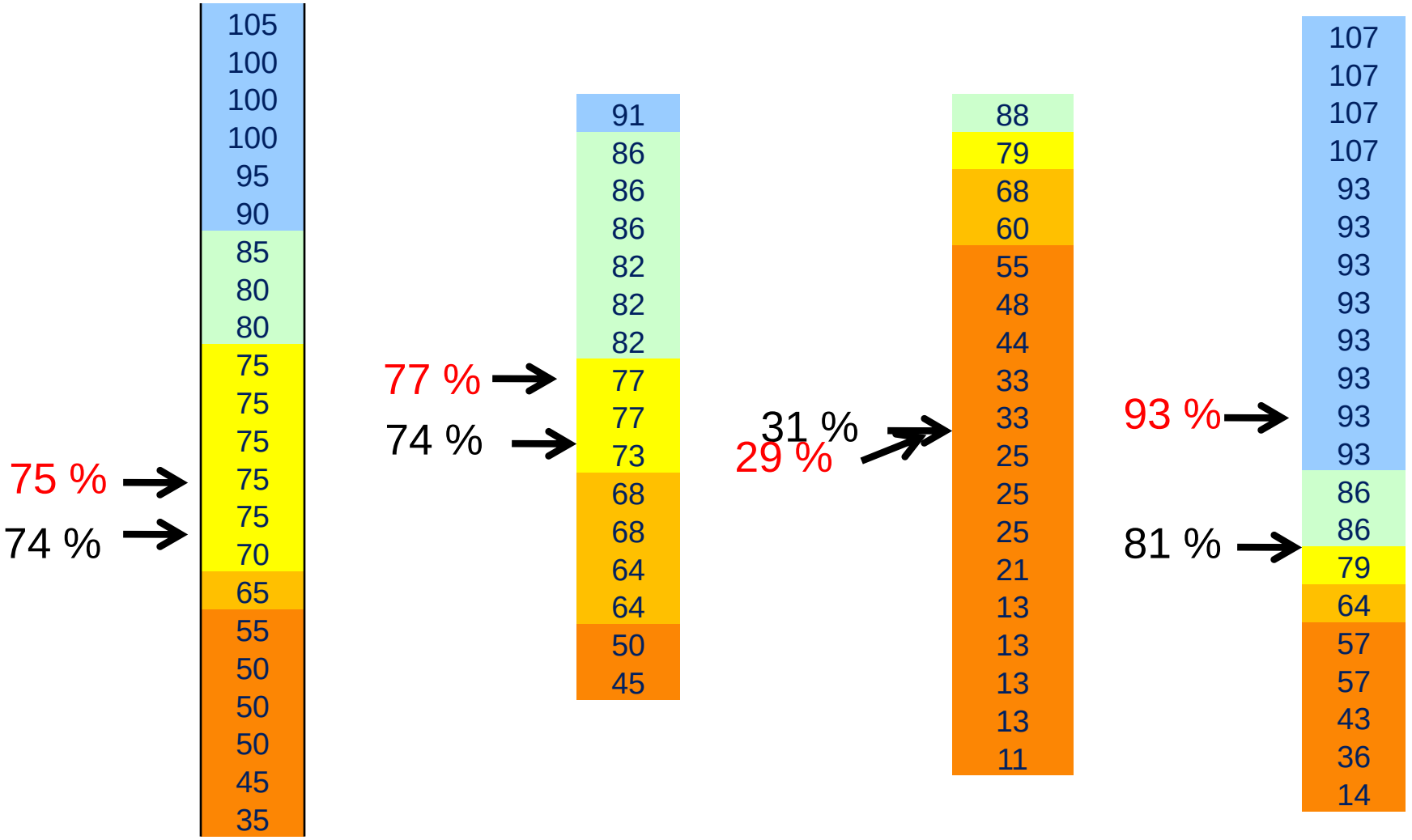
→ median = 7

Utah Median Family Income by Family Size

# People	Median Income
1 Earner	$45,724
Family Size	
2 People	$51,583
3 People	$58,285
4 People	$65,397

Average grade for each:

Median grade for each:



Mode: the number in the data set that occurs most frequently.

Data set: 1, 2, 4, 4, 6, 8, 8, 8, 10, 12

Frequency of occurrence: 4 (occurs 2 times),
8 (occurs 3 times),
all the rest (occur only once)

Mode = 8

Mode: the number in the data set that occurs most frequently.

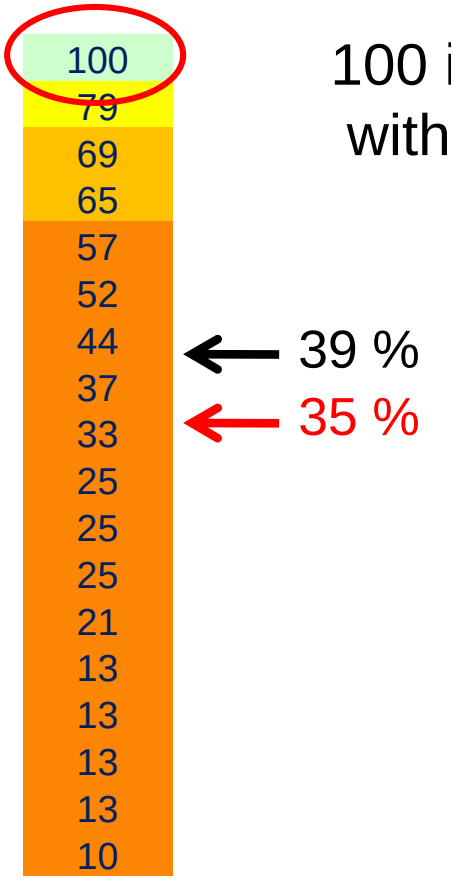
Data set: 1, 2, 4, 4, 6, 8, 8, 10, 12

Frequency of occurrence: 4 (occurs 2 times),
8 (occurs 2 times),
all the rest (occur only once)

Mode = 4 and 8

Outlier: A data point that is much greater or much lower than most of the other data points.

Outliers tend to give misleading impression about a data set.



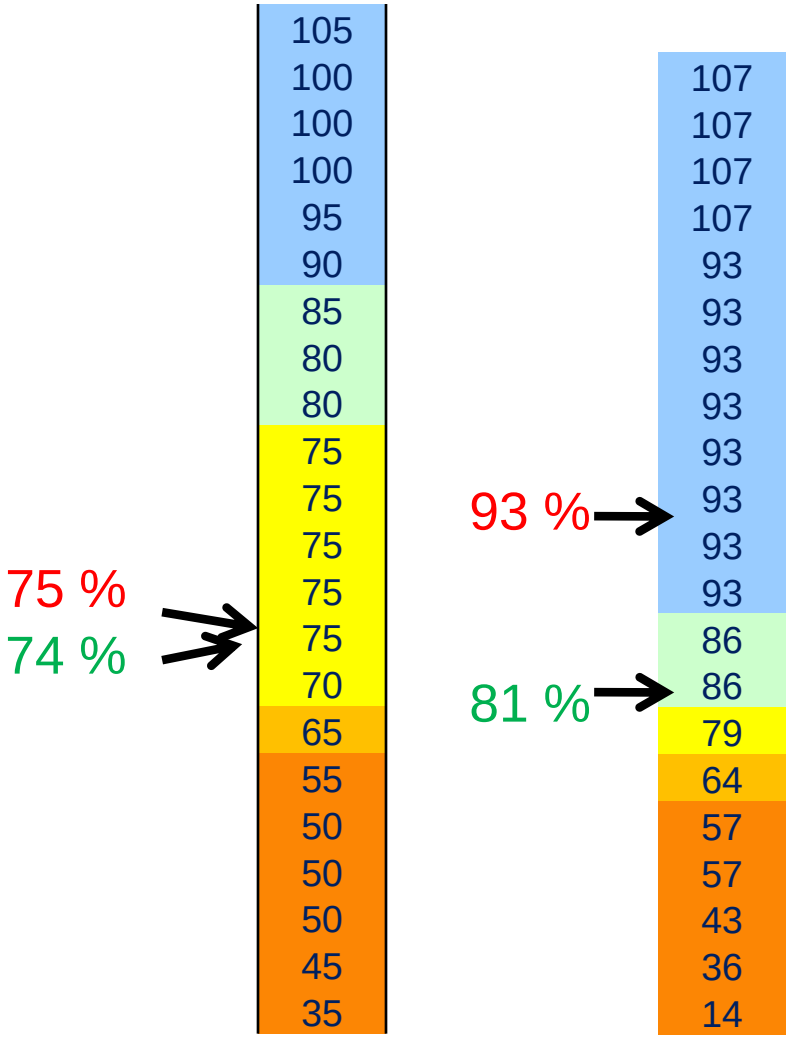
100 is 21 points above 79. All other points are within 10 points of the adjacent data point.

If we “throw out” the outlier (it not being a representative grade for this test/group) see how the mean is effected.

Average grade:

Median grade:

When you compare the mean with the median, you can see if the data is “skewed”



The mean is very sensitive to outliers (as it factors in their magnitude),

while the median is resistant to outliers."

Measure of Central Tendency: a statistic used to represent the “center” or “middle” of the data set.

mean — the average of the data measurements.

the difference between the greatest and least data point.

median — the middle number in the data set.

mode — the data point that occurs most frequently in the data set.