

Math 21 – Pointers for Section 3.1

There are 3 measures of central tendency discussed in this section: mean, median, and mode. They are designed to point you towards a “typical value” that describes a set of data. We will go over how to calculate them, as well as how to recognize some of the shortcomings of each measure.

Mean

This is the number that we used to think of as the arithmetic average, but we don’t call it average because there are several different averages used throughout the semester. To find the mean, just add up all of the values and divide by how many there are.

Rounding: Always round the mean to 1 decimal place beyond the accuracy of the numbers you have.

If you are taking the mean of a population, use the symbol μ . (mu)

If you are taking the mean of a sample, use the symbol \bar{x} . (x-bar)

Median

The median is the value in the exact center of the data. To find the median

- Write the set of data in ascending order, from low to high.
- Divide the set into two equal sized groups.
- If there is a value left in the middle, that value is the median.
- If there is not a single value left between the two groups, take the mean of the middle two values.

If there are an odd number of values, the median will be the one value in the middle. If there are an even number of values, find the mean of the two center values.

Resistant?

A statistic is said to be resistant if adding one extreme value to a set of data does not significantly affect the calculation of that statistic.

The mean is not resistant, because adding an extreme value affects the sum of all the values, which in turn affects the mean itself.

The median is resistant because it focuses on central values, and would not use the new extreme value.

StatCrunch

You can calculate mean and median at the same time.

- Enter all of the data in one column, 1 value per line.
- Press the Stat button, and select Summary Stats > Columns
- Select the column containing your data.
- For Statistics, make sure that at least “Mean” and “Median” are selected. (They will usually be selected by default.)
- Click on Compute!

Mode

The mode is simply the value that *repeats* the most.

If two values are repeated the same number of times, they are both modes.

If no value is repeated, there is no mode.

Since this measure will not always be a typical value, we usually use it only for qualitative data.

StatCrunch will not find the mode for quantitative data, but if you have numerical data you can always create a frequency distribution/bar graph to find the mode. You could also create a stem and leaf display, which will make it easier to find repeated values.