Lesson 3 - Median

So far we have looked at how to calculate **range, mean,** and **mode**. Each one has their own use in statistics. The last calculated value we are going to investigate, **median**, also has a specific purpose.

Range: This value is useful since you know where the values in your data set exist. If we were surveying people to determine if they like a particular tv show or not, it would be useful to know the age range when calculating the results.

Mean: Mean or average is useful since it will tell you what the average amount is based on ALL of the numbers. If you have some very low and/or very high numbers, average helps you normalize your data set.

Mode: Since mode tells you how often values come up in a data set, it is useful since it can tell you the most and least common values. This could be useful if you are trying to determine the most or least common (or popular) options from a list (such as colour, age, clothing size…etc).

Median: Median is going to give you a result that is usually very similar to mean. Median requires you to find the **middle value** in your data set. This is sometimes more useful than mean since mean can be skewed by having a series of very large or very small numbers.

Calculating Median: In order to calculate median, the first thing we need to do it take a data set and put the numbers in order of smallest to largest or largest to smallest. The median is the number that is in the very middle.

For Example: Look at the following data set showing the height of students.

132cm	141cm	128cm	142cm	160cm	155cm	137cm	144cm	122cm	165cm
146cm	152cm	138cm	126cm	164cm	151cm	138cm	145cm	156cm	

If we take all the values and put them in order of largest to smallest we get:

165cm, 164cm, 160cm, 156cm, 155cm, 152cm, 151cm, 146cm, 145cm, (144cm), 142cm, 141cm, 138cm, 138cm, 137cm, 132cm, 128cm, 126cm, 122cm

There are 19 numbers, so the middle number will be the   number

Therefore the Median of the data set is

What is there an even number of data?

| 132cm | 141cm | 128cm | 142cm | 160cm | 155cm | 137cm | 144cm | 122cm | 165cm |
| 146cm | 152cm | 138cm | 126cm | 164cm | 151cm | 138cm | 145cm | 156cm | 120cm |

If we put all the numbers in order we get:

165cm, 164cm, 160cm, 156cm, 155cm, 152cm, 151cm, 146cm, 145cm, 144cm, 142cm, 141cm, 138cm, 138cm, 137cm, 132cm, 128cm, 126cm, 122cm, 120cm

In this case, since there is an even number of data, we need to take the average of the two middle numbers. We just have to make sure there is an even number of numbers to the left and to the right of data we choose.

In this case, the two middle numbers are   and   . We know this since there are exactly 9 numbers to the left and 9 numbers to the right of these two.

Therefore the median is

The following chart shows the populations of Canada's capital cities. Determine which city has the median population.

City	Population
Victoria	85,792
Edmonton	932,546
Regina	215,106
Winnipeg	705,244
Toronto	2,731,571
Quebec City	531,902
Fredericton	58,220
St.John	108,860
Halifax	403,131
Charlottetown	36,094
Whitehorse	25,085
Yellowknife	19,569
Iqaluit	7,740

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Since St.John lies in the middle of the data set, it has the median population.