Measures of spread

Monday, 25 February 2019 5:40 PM

By the end of the lesson I would hope that you have the knowledge and understanding for the following points:

- Know what it means to be a measure of spread
- Know the three different types of Measures of Spread
  - Range
  - IQR (measure of spread of the middle 50% of the data around the median)
  - Standard Deviation (measure of spread around the mean)
- Know what it means to be an outlier

RECAP:

In a previous lesson I spent time looking at the difference between the range and Interquartile Range.
We found that for data with no outliers, the range was a good measure of spread. It showed how spread out around a central value the data was.

However, when there were outliers, this made the range really bad at being a measure of spread.

Hence, we came up with the idea of the Interquartile Range.
We looked at ways of being able to look at the spread without including outliers.

Hence, the IQR looks at the spread of the middle 50% of the data centered around the median.

RECAP: Finding the IQR

To find the IQR we need a set of data.
This data needs to be placed in order.
We then need to split the data into halves and find the middle value (**median)**
And then halve again. Find the middles of the middles otherwise known as the **Upper Quartile** and **Lower Quartile**.
Hence, splitting it into quarters.

Remember: inter**QUARTILE** tells you to split the data into quarters.

Once we have the **Upper Quartile (Q_3)** and the **Lower Quartile (Q_1)** we subtract them to find the IQR.

Example:
Extracted from the Cambridge Essentials Textbook Series

The following data values are the results for a school mathematics test.

67 96 62 85 73 56 79 19 76 23 68 89 81

a) *List the data in order, from smallest to largest.*
b) *Find the range.*
c) *Find:*
   i. *the median (Q2)*
   ii. *the lower quartile (Q1)*
   iii. *the upper quartile (Q3)*
   iv. *the interquartile range (IQR)*

Example 2:
Extracted from the Cambridge Essentials Textbook Series

Here is a set of measurements, collected by measuring the lengths, in metres, of 10 long-jump attempts.

6.7 9.2 8.3 5.1 7.9 8.4 9.0 8.2 8.8 7.1

a) *List the data in order, from smallest to largest.*
b) *Find the range.*
c) *Find:*
   i. *the median (Q2)*
   ii. *the lower quartile (Q1)*
   iii. *the upper quartile (Q3)*
   iv. *the interquartile range (IQR)*
d) *Interpret the IQR.*

5.1 6.7 7.1 7.9 8.2 8.3 8.4 8.8 9.0 9.2

ii. 7.1
iii. 8.8

Range = 9.2 − 5.1
= 4.1

IQR = 8.8 − 7.1
= 1.7 m

Median = $\frac{8.20 + 8.30}{2}$ = 8.25

The middle 50% of my data/jumps has a range of 1.7 m