

Week 6: Data

Try these exercises now, do not use a calculator, and try to solve the exercises without help

Formulae: Mean, $\bar{x} = \frac{\sum x}{n}$, Variance = $\frac{\sum (x-\bar{x})^2}{n} = \frac{1}{n}(\sum x^2 - n\bar{x}^2)$ Standard deviation = $\sqrt{\text{variance}}$

OR for a sample, Mean, $\bar{X} = \frac{\sum fx}{\sum f}$, Variance = $\frac{\sum f(x-\bar{x})^2}{\sum f} = \frac{1}{n}(\sum fx^2 - n\bar{x}^2)$

For samples, divide by $n - 1$ rather than n , to give an unbiased estimate for the variance and sd.

Also:

Median = $\frac{n+1}{2}$ th term (when arranged in size order)

Lower quartile = median of the lower half of the data,

Upper quartile = median of the upper half of the data.

Interquartile range = Upper quartile - Lower quartile.

1. In a science experiment, six students each measured the acceleration due to gravity and their results (in ms^{-2}) were 9.9, 9.7, 9.7, 8.3, 10.1, 10.0. Calculate the mean and explain whether you think this is a good measure of average in this context. (from Foundations of Advanced Mathematics, page 117)
2. For the following data calculate the mean, the median, upper and lower quartiles, inter-quartile range and illustrate in a boxplot. (Extra for those who have already met these concepts: calculate the variance and standard deviation).

Height (cm)

149	160	155	153	142	158	145	150	157	139	158	148
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Given the distribution, suggest what group of people are these data likely to refer to?

3. For the following data calculate the mean, the median, upper and lower quartiles, inter-quartile range and illustrate in a histogram. (Extra for those who have already met these concepts: calculate the variance and standard deviation).

Pulse	Frequency
<50	1
50 - 59	5
60 - 69	34
70 - 79	27
80 - 89	15
90 - 99	9
100+	1
Total	92

According to the NHS, most adults have a resting heart rate of 60 to 100 beats per minute. It says: The fitter you are, the lower your resting heart rate is likely to be. For example, athletes may have a resting heart rate of 40 to 60 bpm or lower. Is the data above consistent with this comment? Explain.