

# Inferential statistics: standard deviation, variance, range



Ask Mish

and the formulas for the standard deviation and the variance are as follows:<sup>6</sup>

## The Standard Deviation for a Sample

$$\begin{aligned} S &= \sqrt{\frac{\text{Sum of squared deviations}}{\text{Number of data items} - 1}} \\ &= \sqrt{\frac{(X_1 - \bar{X})^2 + (X_2 - \bar{X})^2 + \dots + (X_n - \bar{X})^2}{n - 1}} \\ &= \sqrt{\frac{1}{n - 1} \sum_{i=1}^n (X_i - \bar{X})^2} \end{aligned}$$

## The Variance for a Sample

$$\text{Variance} = S^2 = \frac{1}{n - 1} \sum_{i=1}^n (X_i - \bar{X})^2$$

## DISPERSION IN STATISTICS

can be measured not only using S, but also variance and range:

S=standard deviation

Variance

Range = max. value - min. value

in the left, the extended formulas for calculating S and variance for a sample (in case you need)

Standard deviation is used for calculating confidence intervals