

# Statistics: Formula Sheet

Nick Maini

December 2022

## Range

$$Range = Max(X) - Min(X)$$

## Deviation

$$D_i = x_i - (\bar{x})$$

$$|D_i| = |x_i - (\bar{x})|$$

## Arithmetic mean

Population mean:

$$\mu = \frac{1}{N} \sum_{i=1}^N X_i$$

Sample mean:

$$\bar{x} = \frac{1}{n} \sum_{i=1}^N X_i$$

## Mean absolute deviation

Population mean absolute deviation

$$MAD_{\mu} = \frac{1}{N} \sum_{i=1}^N |x_i - \mu|^2$$

Sample mean absolute deviation

$$MAD_{\bar{x}} = \frac{1}{n} \sum_{i=1}^n |x_i - \bar{x}|^2$$

## Standard deviation

Population standard deviation:

$$\sigma = \sqrt{\frac{1}{N} \sum_{i=1}^N (x_i - \mu)^2}$$

Sample standard deviation:

$$s = \sqrt{\frac{1}{n-1} \sum_{i=1}^n (x_i - \bar{x})^2}$$

## Variance

Population variance

$$\sigma^2 = \frac{\sum_{i=1}^N (x_i - \mu)^2}{N}$$

Sample variance

$$s^2 = \frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n-1}$$