

## Symbols

$\mu$	Mean of population	$\sigma$	Standard deviation of population data
$\bar{x}$	Mean of sample	$s$	Standard deviation of sample
$\sigma^2$	Variance of population data	$N(\mu, \sigma^2)$	Normal distribution with specified $\mu$ and $\sigma^2$
$s^2$	Variance of sample data, unbiased		
$s_n^2$	Variance of sample data, biased		

## Definitions

First Quartile (Q1)	The median of all values lower than the population median
Third Quartile (Q3)	The median of all values higher than the population median
Interquartile Range (IQR)	The difference between the 3rd and 1st quartiles; <i>i.e.</i> , $Q3 - Q1$
Outlier	A data value that lies more than $1.5 \times \text{IQR}$ above Q3 or below Q1. The outlier is <i>extreme</i> if it lies more than $3 \times \text{IQR}$ from the closest Q and <i>mild</i> otherwise

## Normal Distribution

### To Calculate Standard Deviation

- Calculate the mean ( $\mu$ )
- Calculate the distance of each data value from the mean ( $\text{value} - \mu$ )  
This is the *deviation* of each data point
- Square each deviation
- Calculate the “unbiased average” of the squares by adding them up and dividing by  $n-1$ .  
This is the *variance* of the data ( $\sigma^2$ )
- Take the square root of the variance  
The result is the standard deviation

