Statistical formulas

		Formulas		
Statistics	Excel function	Sample	Freq. table	Interpretation
Mean $\bar{x}$	`AVERAGE(sample)`	$\frac{\sum x_i}{n}$	$\sum x_i f_i$	The value that best represent the values of the sample (except when there are outliers).
Median Me	`MEDIAN(sample)`			The value in the middle of the ordered sample. 50% of values of the sample are above and 50% below it.
Mode Mo	`MODE(sample)`			The most common value in the sample.
Minimum Min	`MIN(sample)`	$\min\{x_i\}$		The minimum value of the sample.
Maximum Max	`MAX(sample)`	$\max\{x_i\}$		The maximum value of the sample.
First quartile Q_1	`QUARTILE(sample,1)`			25% of the values of the sample are lower or equal to it.
Second quartile Q_2	`QUARTILE(sample,2)`			50% of the values of the sample are lower or equal to it.
Third quartile Q_3	`QUARTILE(sample,3)`			75% of the values of the sample are lower or equal to it.
Decile i D_i	`PERCENTILE(sample, i/10)`			$i * 10$% of the values of the sample are lower or equal to it.
Percentile i P_i	`PERCENTILE(sample, i/100)`			i% of the values of the sample are lower or equal to it.
Range	`MAX(sample)-MIN(sample)`	$Max - Min$	$Max - Min$	Measures the overall spread of the sample.
Interquartile Range IQR	`QUARTILE(sample,3)-QUARTILE(sample,1)`	$Q_3 - Q_1$	$Q_3 - Q_1$	Measures the spread of the 50% central values of the sample.
Variance s^2	`VAR.P(sample)`	$\frac{\sum(x_i - \bar{x})^2}{n}$	$\sum(x_i - \bar{x})^2 f_i$	Measures the average spread with respect to the mean in square units.
Standard deviation s	`STDEV.P(sample)`	$\sqrt{s^2}$	$\sqrt{s^2}$	Measures the average spread with respect to the mean in the units of the variable.
Coef. variation cv	`STDEV.P(sample)/ABS(AVERAGE(SAMPLE))`	$\frac{s}{\lvert\bar{x}\rvert}$	$\frac{s}{\lvert\bar{x}\rvert}$	Measures the relative spread with respect to the mean. It has no units. The lower the dispersion, the more representative is the mean.
Coef. skewness g_1	`SKEW(sample)`	$\sum\left(\frac{x_i - \bar{x}}{s}\right)^3$	$\sum\left(\frac{x_i - \bar{x}}{s}\right)^3 f_i$	Measures the asymmetry of the sample distribution ($g_1 = 0$ symmetry, $g_1 > 0$ right-skewed, $g_1 < 0$ left-skewed).
Coef. kurtosis g_2	`KURT(sample)`	$\sum\left(\frac{x_i - \bar{x}}{s}\right)^4 - 3$	$\sum\left(\frac{x_i - \bar{x}}{s}\right)^4 f_i - 3$	Measures the peakness or flatness of the sample distribution compared to a normal distribution ($g_2 = 0$ normal kurtosis, $g_1 > 0$ leptokurtic or peaked distribution, $g_1 < 0$ platykurtic or flat distribution).