



### Definitions and Terms

Average:	See Mean
Data:	Data are the values or measurements that you take in your experiments.
Degrees of Freedom:	Abbreviated df, and it is the number of variables that are free to change or free to be selected in a statistical calculation. For example, if you have $a+b+c+d+e+f+g=100$ , there are 7 variables in that equation, but 6 of them are independent variables and 1 of them is a dependent variable. The values of a, b, c, d, e, and f can be anything you like, but that means there is one and only one number to select for g that makes the calculation true. So in this question although there are 7 variables, you only have 6 degrees of freedom (only 6 numbers can be anything you like), the 7th must be one and only one number to make the equation be true. In Statistics, a sample size of n would have n-1 degrees of freedom. If we have 10 data values, and the mean (average) is 9, we know that the sum of the total data values is 90. 9 of the data values could be anything they want, but the 10th value can only be 1 possible number to make the sum total be 90, so even though there are 10 data values, there are $10-1=9$ degrees of freedom.
Descriptive Statistics:	The analysis of the collected data that will describe or show the results in a meaningful way, such as charts, graphs, and tables along with a summary of the results. Descriptive statistics include mean, median, mode, as well as more complex items such as range, quartiles, standard deviation, and variance.
Hypothesis:	A statement that is used to describe what you intend to show with your data. In Statistics, the Null Hypothesis is often stated. The Null Hypothesis is simply stating that there is no difference in the data of the groups that are being measured.
Inferential Statistics:	Making inferences or implications about the characteristics of an entire population based on a sample set of data.
Kurtosis:	A unitless measurement that describes whether the shape of the data distribution matches the Gaussian distribution. A Gaussian distribution has a kurtosis of 0. A flatter distribution has a negative kurtosis. A distribution more peaked than a Gaussian distribution has a positive kurtosis.
Mean:	The mean of a set of data is the average of the numerical data values.



**Definitions and Terms**

	<p>It is found by adding the data values together and dividing by the number of data values that are used.</p> <p>Example: What is the mean of the data values 10, 8, 6, 5, 2, 2, 2, 1, 0? There are 9 data values (called n), they add to 36  <math>(10+8+6+5+2+2+2+1+0)</math> The mean (or average) is <math>36/9 = 4</math></p>
Median:	<p>The median of the data is the numerical value or data point in the middle, when the data set is arranged in order.</p> <p>Example: What is the median of the data values 10, 8, 6, 5, 2, 2, 2, 1, 0? Write the data in order from largest to smallest, the median is the middle value when n (the number of data values) is odd and its the arithmetic average of the middle two numbers when n is even. In this case <math>n=9</math> and median = 2 Example: What is the median of the data values 10, 5, 5, 3, 2, 2, 1, 0? Write the data again largest to smallest, since <math>n=8</math>, the middle two values are 3, and 2 we our median is <math>(3+2)/2 = 2.5</math></p>
Mode:	<p>The mode is the numerical value that appears most frequently (and more than once) in the data set.</p> <p>Example: What is the mode of the data values 10, 8, 6, 5, 2, 2, 2, 1, 0? From the data set we see that the value 2 appears most often, so the mode = 2.</p> <p>It is possible to have more than one mode, when two data values are the same number of times and appear more than any other data value. This is called Bi-modal. If there are three numbers that are all a mode, it is tri-modal.</p> <p>A data set where each data value only appears once does not have a mode.</p>
Normal Distribution:	<p>The normal distribution depends on two factors - the mean and the standard deviation. The mean of the distribution determines the location of the center of the graph, and the standard deviation determines the height of the graph. When the standard deviation is large, the curve is short and wide; when the standard deviation is small, the curve is tall and narrow. All normal distributions look like a symmetric, bell-shaped curve.</p>
Null Hypothesis:	<p>The Null Hypothesis is a statement which indicates that you expect to find no difference in your measurement groups, indicating that the observations from your data occur purely from chance. In Statistics,</p>



### Definitions and Terms

	the Null Hypothesis is proposed and hopes that your data supports REJECTING the null hypothesis and thus the observations results do not occur from pure chance.
Population:	The population is a complete collection of data that is being studied or analyzed, and it contains all subjects of interest.
Sample Size:	The sample size is the number of data points in your analysis, and is referred to as n
Skewness:	A unitless measurement that describes the symmetry of your distribution. A symmetrical distribution has a skewness of 0. A non-symmetrical distribution that has a long tail to the right has a positive skewness. A non-symmetrical distribution that has a long tail to the left has a negative skewness.
Standard Deviation:	The square root of the Variance.
Statistic:	A data value or single measurement from a larger sample.
Statistical Significance:	This is the likelihood or the probability that a finding or result is caused by something other than just chance.
Statistics:	The collection, analysis, interpretation, and presentation of numerical or qualitative data.
Variables:	There are two types of variables - Dependent and Independent Variables. An Independent variable can be anything you want, the dependent variable will change based on your independent variable. For example, if you have $x+8=y$ , then x is your Independent variable, it can be anything you want it to be. y is the dependent variable and is determined by the value you select of x.
Variance:	Common measure of the spread of the data distribution. Variance is a measure of dispersion. It is the average squared distance between the mean and each item in the population or in the sample.