“How can I use the TDIST function in Excel to calculate the probability of a t-statistic for a given set of data?”

Authored by

stats writer

July 1, 2024

The TDIST function in Excel is a statistical tool that can be used to calculate the probability of a t-statistic for a given set of data. This function is particularly useful in analyzing data sets with small sample sizes, where a t-test is often used to determine the significance of the results. By inputting the t-statistic and degrees of freedom into the TDIST function, users can obtain the probability of obtaining a t-value as extreme or more extreme than the one observed in their data. This can aid in making informed decisions and drawing conclusions from the data.

This article describes the formula syntax and usage of the **TDIST** function in Microsoft Excel.

Description

Returns the Percentage Points (probability) for the Student t-distribution where a numeric value (x) is a calculated value of t for which the Percentage Points are to be computed. The t-distribution is used in the hypothesis testing of small sample data sets. Use this function in place of a table of critical values for the t-distribution.

Important: This function has been replaced with one or more new functions that may provide improved accuracy and whose names better reflect their usage. Although this function is still available for backward compatibility, you should consider using the new functions from now on, because this function may not be available in future versions of Excel.

For more information about the new functions, see T.DIST.2T function and T.DIST.RT function.

Syntax

TDIST(x,deg_freedom,tails)

The TDIST function syntax has the following arguments:

X Required. The numeric value at which to evaluate the distribution.

Deg_freedom Required. An integer indicating the number of degrees of freedom.

Tails Required. Specifies the number of distribution tails to return. If Tails = 1, TDIST returns the one-tailed distribution. If Tails = 2, TDIST returns the two-tailed distribution.

Remarks

If any argument is non-numeric, TDIST returns the #VALUE! error value.

If Deg_freedom < 1, TDIST returns the #NUM! error value.

The Deg_freedom and Tails arguments are truncated to integers.

If Tails is any value other than 1 or 2, TDIST returns the #NUM! error value.

If x < 0, then TDIST returns the #NUM! error value.

If Tails = 1, TDIST is calculated as TDIST = P(X>x), where X is a random variable that follows the t-distribution. If Tails = 2, TDIST is calculated as TDIST = P(|X| > x) = P(X > x or X < -x).

Since x < 0 is not allowed, to use TDIST when x < 0, note that TDIST(-x,df,1) = 1 - TDIST(x,df,1) = P(X > -x) and TDIST(-x,df,2) = TDIST(x,df,2) = P(|X| > x).