How do I use the POISSON.DIST function in Excel?

Authored by

stats writer

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The POISSON.DIST function in Excel is a statistical function that allows users to calculate the probability of a certain number of events occurring within a given time frame, based on a known average rate of occurrence. It is commonly used in data analysis and forecasting. To use this function, users must provide the required arguments such as the number of events, the average rate, and whether the distribution is cumulative or not. The function will then return the probability value, which can be used in further calculations or displayed in a cell. The POISSON.DIST function is a useful tool for analyzing and predicting data, making it a valuable feature in Excel for users in various industries.

Returns the Poisson distribution. A common application of the Poisson distribution is predicting the number of events over a specific time, such as the number of cars arriving at a toll plaza in 1 minute.

Syntax

POISSON.DIST(x,mean,cumulative)

The POISSON.DIST function syntax has the following arguments:

X Required. The number of events.

Mean Required. The expected numeric value.

Cumulative Required. A logical value that determines the form of the probability distribution returned. If cumulative is TRUE, POISSON.DIST returns the cumulative Poisson probability that the number of random events occurring will be between zero and x inclusive; if FALSE, it returns the Poisson probability mass function that the number of events occurring will be exactly x.

Remarks

If x is not an integer, it is truncated.

If x or mean is nonnumeric, POISSON.DIST returns the #VALUE! error value.

If x < 0, POISSON.DIST returns the #NUM! error value.

If mean < 0, POISSON.DIST returns the #NUM! error value.

POISSON.DIST is calculated as follows.

For cumulative = FALSE:

For cumulative = TRUE:

$$CUMPOISSON = \sum_{k=0}^{x} \frac{e^{-\lambda} \lambda^{k}}{k!}$$

Example

Copy the example data in the following table, and paste it in cell A1 of a new Excel worksheet. For formulas to show results, select them, press F2, and then press Enter. If you need to, you can adjust the column widths to see all the data.

Data	**Description**	
2	Number of events	
5	Expected mean	
Formula	**Description**	**Result**
=POISSON.DIST(A2,A3,TRUE)	Cumulative Poisson probability with the arguments specified in A2 and A3.	0.124652
=POISSON.DIST(A2,A3,FALSE)	Poisson probability mass function with the arguments specified in A2 and A3.	0.084224