Linearna interpolacija

Pogosto potrebujemo vrednost neke fizikalne količine pri dani temperaturi, na voljo pa imamo samo tabelo te količine pri različnih temperaturah. Težava nastopi, če 'naše' temperature ni v tabeli.

Tedaj uporabimo t.i. *interpolacijo* po eni izmed metod, kot so linearna, polinomska ali kubični spline.

Linearna interpolacija je najenostavnejša med vsemi in deluje med dvema znanima točkama T1(x1,y1) in T2(x2,y2). 'Naš' x mora biti med x1 in x2.

Enačba premice skozi ti dve točki se glasi:

V Excelu je vgrajena funkcija FORECAST(x; znani_y; znani_x), ki nam vrne vrednost y, izračunano po zgornji enačbi.

http://office.microsoft.com/en-us/excel-help/forecast-HP005209096.aspx?CTT=5&origin=HP005204211

Če je točk več kot 2, FORECAST izračuna premico z linearno regresijo.

FORECAST

Calculates, or predicts, a future value by using existing values. The predicted value is a y-value for a given x-value. The known values are existing x-values and y-values, and the new value is predicted by using linear regression. You can use this function to predict future sales, inventory requirements, or consumer trends.

Syntax

FORECAST(x,known_y's,known_x's)

X   is the data point for which you want to predict a value.

Known_y's   is the dependent array or range of data.

Known_x's   is the independent array or range of data.

Remarks

- If x is nonnumeric, FORECAST returns the #VALUE! error value.
- If known_y's and known_x's are empty or contain a different number of data points, FORECAST returns the #N/A error value.
- If the variance of known_x's equals zero, then FORECAST returns the #DIV/0! error value.
- The equation for FORECAST is a+bx, where:

$$a = \bar{y} - b\bar{x}$$

and:

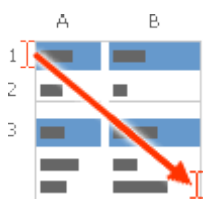$$b = \frac{\sum (x - \bar{x})(y - \bar{y})}{\sum (x - \bar{x})^2}$$

and where x and y are the sample means AVERAGE(known_x's) and AVERAGE(known y's).

Example

The example may be easier to understand if you copy it to a blank worksheet.

- Create a blank workbook or worksheet.
- Select the example in the Help topic.

Do not select the row or column headers.

Selecting an example from Help

- Press CTRL+C.
- In the worksheet, select cell A1, and press CTRL+V.
- To switch between viewing the results and viewing the formulas that return the results, press CTRL+` (grave accent), or on the **Formulas** tab, in the **Formula Auditing** group, click the **Show Formulas** button.

	A	B
	Known Y	**Known X**
1	6	20
2	7	28
3	9	31
4	15	38
5	21	40
6	**Formula**	**Description (Result)**
	=FORECAST(30,A2:A6,B2:B6)	Predicts a value for y given an x value of 30 (10.60725)