Linear Interpolation with Excel

Bill Menke, July 2016

It can be done, but it's not pretty! Here's how I do it, using an algorithm that I modified from:

www.blueleafsoftware.com/Products/Dagra/LinearInterpolationExcel.php#Excel

First, cell definitions, corresponding to the figure below.

Columns A and B are the uninterpolated (X,Y) pairs.

Cell D1 is just a title and is the character string "Dx"

Cell D2 is the interpolation step size that you want

Cell D3 is just a title and is the character string "Old N"

Cell D4 is the number of rows of uninterpolated data

Columns E and F are the interpolated (X, Y) values.

To set column E, type into Cell E1 the formula

= A1

and paste into Cell E2 the formula

=E1+$D$2

and then fill the column down (starting from row 2) to the desired length. The last value must be smaller (though possibly only very slightly smaller) than the last X value in Column A.

To set column F, paste into Cell F1 the formula

=FORECAST(E1,OFFSET(INDIRECT("$B$1:B"&$D$4),MATCH(E1,INDIRECT("$A$1:A"&$D$4),1)-1,0,2),OFFSET(INDIRECT("$A$1:A"&$D$4),MATCH(E1,INDIRECT("$A$1:A"&$D$4),1)-1,0,2))

(yeah, I know, messy!) and then fill the column down (starting from row 1) to the same length as Column E. The column should fill in as the interpolated values.

excel_interpolator

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	1	1		Dx	1	1		Bill Menke's Excel Interpolator, July 2016								
2	2.2	2		0.605	1.605	1.504167		modified from www.blueleafsoftware.com/Products/Dagra/LinearInterpolationExcel.php#Excel								
3	4.2	3		Old N	2.21	2.005		Instructions								
4	6.2	4		8	2.815	2.3075		1. Paste uninterpolated (X,Y) data into columns (A,B)								
5	8.1	3			3.42	2.61		2. Change cell D4 to the number of uninterpolated data pairs								
6	10.9	2			4.025	2.9125		3. Change cell D2 to the interpolation step size you desire								
7	13.2	1			4.63	3.215		4. Fill down column E of New X's from row 2 to however long you need								
8	15	0			5.235	3.5175		(but last X value must be less than last uninterpolated X)								
9					5.84	3.82		5. Fill down column F of New Y's from row 1 to the same length as column E								
10					6.445	3.871053										
11					7.05	3.552632										
12					7.655	3.234211										
13					8.26	2.942857										
14					8.865	2.726786										
15					9.47	2.510714										
16					10.075	2.294643										
17					10.68	2.078571										
18					11.285	1.832609										
19					11.89	1.569565										
20					12.495	1.306522										
21					13.1	1.043478										
22					13.705	0.719444										
23					14.31	0.383333										
24					14.915	0.047222										
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