How to make a Histogram with Excel

Histograms displaying frequencies of occurrence of the different observations in a data set are commonly used in the display of statistical analyses. Microsoft Excel does not have a built in Histogram chart type to properly display this type of histograms, but you can create your own custom Histograms displaying frequencies of occurrence. This tutorial shows how to make histograms in all modern versions of Excel.

Histograms – Using the Frequency function in Excel

To start with, it is usually a good idea to scan your data and get a feel for its overall range (it is thus better to calculate it since the beginning, as shown in the tutorial in DataAnalysisSession1.xls). For the data in data1.txt, the range is from 0.1 to 1.24. Next you will want to decide how fine you want the increment of your bins. The finer the increment, the more bins, and thus the more bars on your chart. For this example we have chosen a bin increment of 0.114 starting with 0.1. Depending on what you want to depict, you may want to show an empty bin above and/or below the extreme values of your samples to show the viewer that you are at the extremes of your data set. Type in these bin increments in a column next to your raw data (as an example, look at the sheet "histogram" in the tutorial in DataAnalysisSession1.xls):

	A	B
1	**urinary concentrations of copper in n = 40 children**	**Bin Limits**
2	0.7	0.1
3	0.45	0.214
4	0.72	0.328
5	0.3	0.442
6	1.16	0.556
7	0.69	0.67
8	0.83	0.784
9	0.74	0.898
10	1.24	1.012
11	0.77	1.126
12	0.65	1.24
13	0.76	
	.	
	.	
	.	
41	0.88	

Though you can manually count the number of measurements that fall within each of these bins, an easier way is to use the Excel function FREQUENCY. This function is a bit more complex than functions such as MEAN. The FREQUENCY function is an array function, returning values to a range of cells.

Highlight the range of cells which will hold the frequency counts (C2:C12). These will be all of the Frequency Count cells next to the bin increments.

	A	B	C
1	**urinary concentrations of copper in n = 40 children**	**Bin Limits**	**Frequency Count**
2	0.7	0.1	
3	0.45	0.214	
4	0.72	0.328	
5	0.3	0.442	
6	1.16	0.556	
7	0.69	0.67	
8	0.83	0.784	
9	0.74	0.898	
10	1.24	1.012	
11	0.77	1.126	
12	0.65	1.24	

Choose Insert>Function..., pick the Statistical Function category and scroll down in the box on the right and choose FREQUENCY as the Function name.
Use the dialogue box to enter the function. With the “Data_array” box selected, go to the spreadsheet page and highlight the data values (A2:A41). The dialogue box with "roll up" while you highlight these values and then "roll down" when you are done.
Repeat this process by selecting the “Bins_array” box and then go out the spreadsheet and highlight the bin limits cells (B2:B12).
Click OK. The completed formula is seen in the formula bar and the correct count value is seen in the Bin Limit 0.1 count cell (C2)

	A	B	C
1	**urinary concentrations of copper in n = 40 children**	**Bin Limits**	**Frequency Count**
2	0.7	0.1	1
3	0.45	0.214	
4	0.72	0.328	
5	0.3	0.442	
6	1.16	0.556	
7	0.69	0.67	
8	0.83	0.784	
9	0.74	0.898	
10	1.24	1.012	
11	0.77	1.126	
12	0.65	1.24	

What has not been done yet is to copy the array function down to the other Frequency Count cells. This is a bit different that typical cell copying:

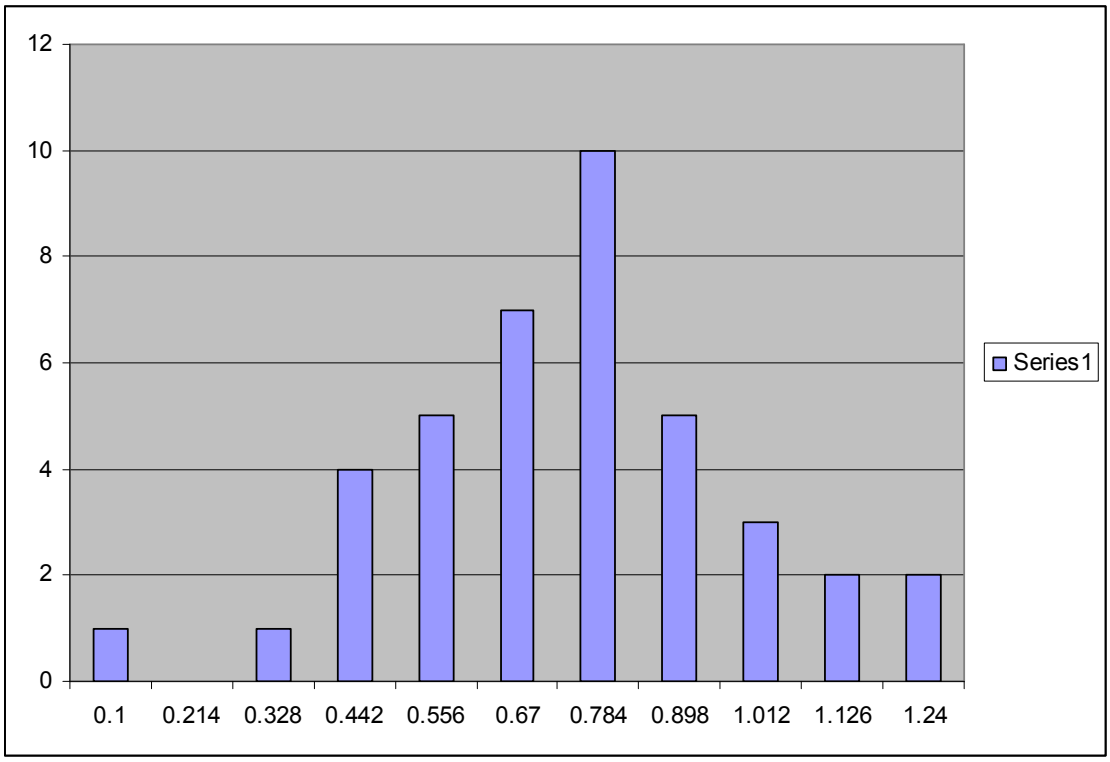
With the Frequency Count cells still highlighted (C2:C12), click on the FREQUENCY function into the formula bar (i.e., =FREQUENCY(A3:A26,C3:C8))
Propagate the function by typing Control-Shift-Enter on a PC.
The frequency values should now fill the cells next to the bin increments. Note that your first bin increment, 0.1, holds all the measurements at 0.1 and below. The next bin, 1.24, holds measurements from 1.126 to 1.24, and so on. The result should look like this:

	A	B	C
1	**urinary concentrations of copper in n = 40 children**	**Bin Limits**	**Frequency Count**
2	0.7	0.1	1
3	0.45	0.214	0
4	0.72	0.328	1
5	0.3	0.442	4
6	1.16	0.556	5
7	0.69	0.67	7
8	0.83	0.784	10
9	0.74	0.898	5
10	1.24	1.012	3
11	0.77	1.126	2
12	0.65	1.24	2

Creating a Histogram

You can now create a bar graph. Insert a Clustered Columns chart type. At step 2, select the "Series" window. With the "Values" box selected, go to the spreadsheet page and highlight the Frequency Count values (C2:C12). With the "Category (X) axis label" box selected, go to the spreadsheet page and highlight the Bin Limits values (B2:B12).

Your histogram is now ready!



You can make it prettier by adding a title, proper axis labels, etc.