Create Histogram using HISTOGRAM in Excel 2013

Milo Schield
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Demo and slides at: www.StatLit.org/pdf/
Excel2013-Create-Histogram-Using-HISTOGRAM-demo.pdf
Excel2013-Create-Histogram-Using-HISTOGRAM-slides.pdf

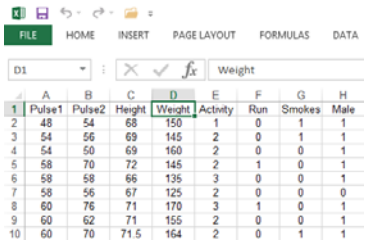
The Goal and Approach

Goal: Use Excel Toolpak HISTOGRAM command to summarize data and generate Excel histogram graph. Modify histogram to eliminate spaces between bars.

Excel 2013 has two ways to summarize continuous data:
1. Using functions: COUNTIF or FREQUENCY
2. Using a command: **Histogram** in Data Analysis

Compared to functions, the Toolpak command has
- One advantage: Easier/faster to create.
- Three disadvantages: Needs a manual update. Doesn't give ranges. Doesn't eliminate spaces between bars.

Use Excel Toolpak command: Create Histogram of Weight



	A	B	C	D	E	F	G	H
1	Pulse1	Pulse2	Height	Weight	Actnty	Run	Smokes	Male
2	48	54	68	150	1	0	1	1
3	54	56	69	145	2	0	1	1
4	54	50	69	160	2	0	0	1
5	58	70	72	145	2	1	0	1
6	58	58	66	135	3	0	0	1
7	58	56	67	125	2	0	0	0
8	60	76	71	170	3	1	0	1
9	60	62	71	155	2	0	0	1
10	60	70	71.5	164	2	0	1	1

Data at: www.StatLit.org/xls/Excel2013-Create-Histogram-Using-HISTOGRAM-Data.xlsx

Steps to Create a Histogram using HISTOGRAM command

A. Determine the number of bins and the bin width
B. Set bin maximums

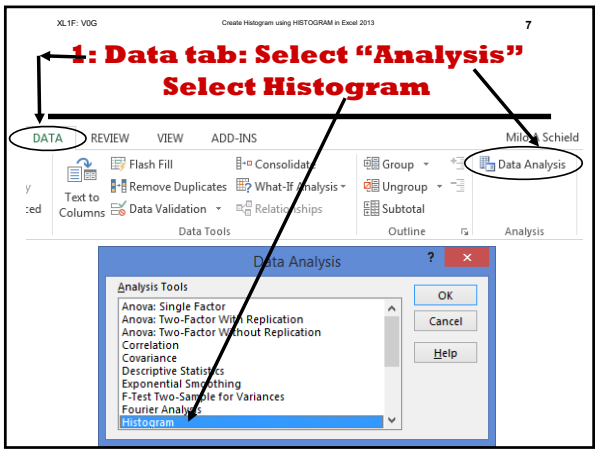
1. Use Data Analysis Toolpak. Select HISTOGRAM
2. Enter data into HISTOGRAM command to:
   - generate bin counts
   - generate an Excel Histogram
3. Eliminate gaps between bars in Excel Histogram Modify caption on the horizontal axis.

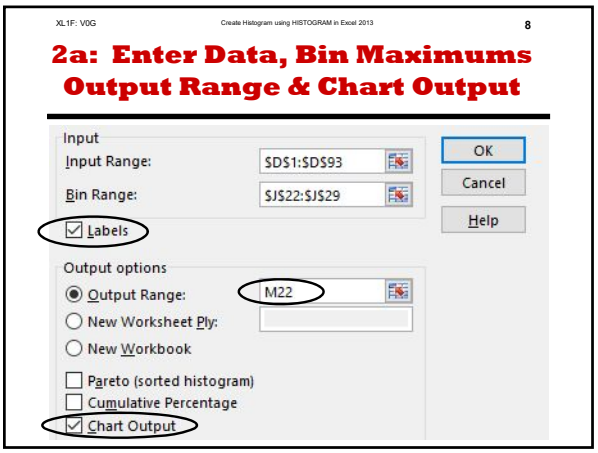
A: Determine bin # & width: Enter formulas as shown.

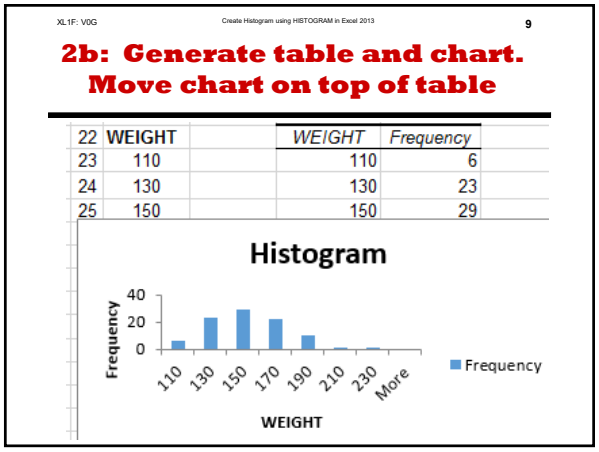
	J	K	L	M	N	O	P
2	Start:		Col D	Identify data to be summarized			
3			D2:D93	Identify range:			
4							
5							
6	Step A:	Determine # and width of bins			*Enter formulas & manual entry*		
7		# of data values		92	=COUNTA(D2:D93)		
8		# of bins (Calculated)		6.52	=LOG(M7,2)		
9		Select # bins (Manual entry)		7	Round up to an integer		
10							
11			Max	215	=MAX(D2:D93)		
12			Min	95	=MIN(D2:D93)		
13			Range	120	=M11-M12		
14		Bin Width (Calculated)		17.14	=M13/M9		
15		Select width (Manual entry)		20	Round # above to an integer		

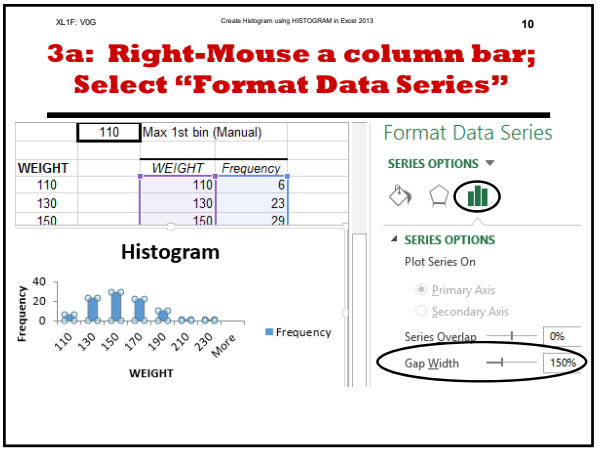
B: Enter 1st Bin Maximum; Generate Bin Maximums

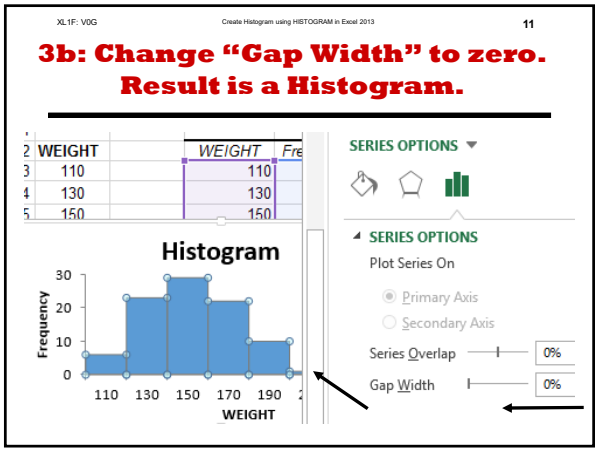
	J	K	L	M	N	O	P
17							
18	Step B:	Set bin maximum of first/lowest bin			*Enter formulas & manual entry*		
19		Max 1st bin (Calculated)		114	=M12+M15-1		
20		Max 1st bin (Manual entry)		110	Round down to nearest 5 or 10		
21							
22	**Bin Max**	*Enter formulas:*					
23	110	=M20					
24	130	=J23+M$15					
25	150	Pull J24 down to J29					
26	170						
27	190						
28	210						
29	230						
30							

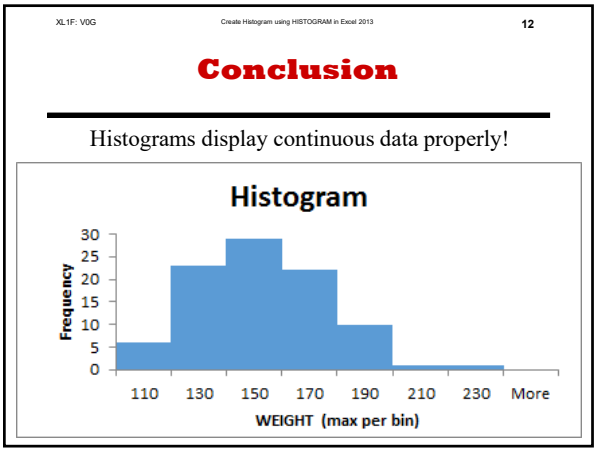

XL1F: V0G
Create Histogram using HISTOGRAM in Excel 2013
7
1: Data tab: Select "Analysis" Select Histogram
DATA
REVIEW
VIEW
ADD-INS
Data Analysis
Data Tools
Outline
Analysis
Data Analysis
Analysis Tools
Anova: Single Factor
Anova: Two-Factor With Replication
Anova: Two-Factor Without Replication
Correlation
Covariance
Descriptive Statistics
Exponential Smoothing
F-Test Two-Sample for Variances
Fourier Analysis
Histogram
OK
Cancel
Help


XL1F: V0G
Create Histogram using HISTOGRAM in Excel 2013
8
2a: Enter Data, Bin Maximums Output Range & Chart Output
Input
Input Range:
$D$1:$D$93
Bin Range:
$J$22:$J$29
Labels
Output options
Output Range:
M22
New Worksheet Ply:
New Workbook
Pareto (sorted histogram)
Cumulative Percentage
Chart Output
OK
Cancel
Help


XL1F: V0G
Create Histogram using HISTOGRAM in Excel 2013
9
2b: Generate table and chart. Move chart on top of table
WEIGHT
Frequency
110 6
130 23
150 29
Histogram
Frequency
WEIGHT
Frequency


XL1F: V0G
Create Histogram using HISTOGRAM in Excel 2013
10
3a: Right-Mouse a column bar; Select "Format Data Series"
Max 1st bin (Manual)
Histogram
Frequency
WEIGHT
Format Data Series
SERIES OPTIONS
Plot Series On
Primary Axis
Secondary Axis
Series Overlap
Gap Width


XL1F: V0G
Create Histogram using HISTOGRAM in Excel 2013
11
3b: Change "Gap Width" to zero. Result is a Histogram.
SERIES OPTIONS
Plot Series On
Primary Axis
Secondary Axis
Series Overlap
Gap Width
Histogram
Frequency
WEIGHT


XL1F: V0G
Create Histogram using HISTOGRAM in Excel 2013
12
Conclusion
Histograms display continuous data properly!
Histogram
Frequency
WEIGHT (max per bin)

Histogram versus Bar/Column Chart

A bar or column chart involves bars that are separated because the data is categorical (e.g., male/female) or discrete numeric (e.g., # of kids in family).

A histogram involves bars (horizontal or vertical) that can touch because the data is continuous numeric (e.g., heights or weights).

Ordinal data (e.g., small, medium, large) can be displayed either way: with separated or touching bars.

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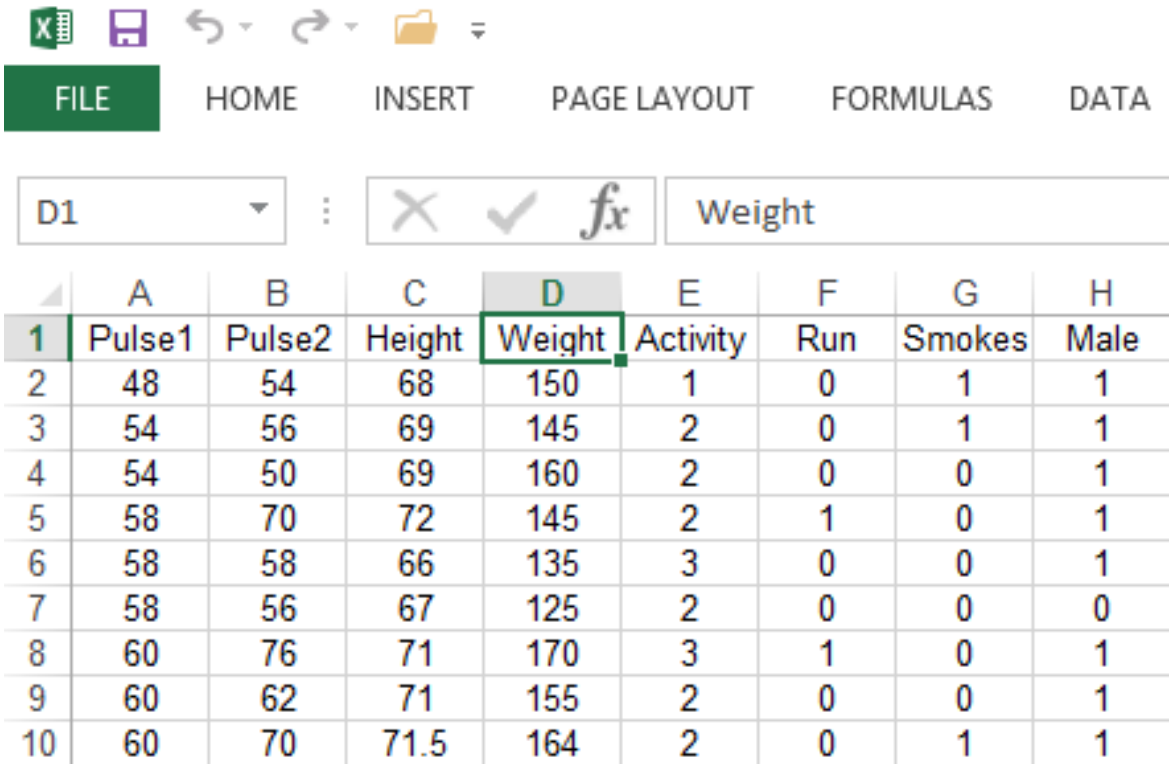
Use Excel Toolpak command: Create Histogram of Weight



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4									4
5									5
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9			Select # bins (Manual entry)		7	Round up to an integer			9
10									10
11				Max	215	=MAX(D2:D93)			11
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27	190						
28	210						
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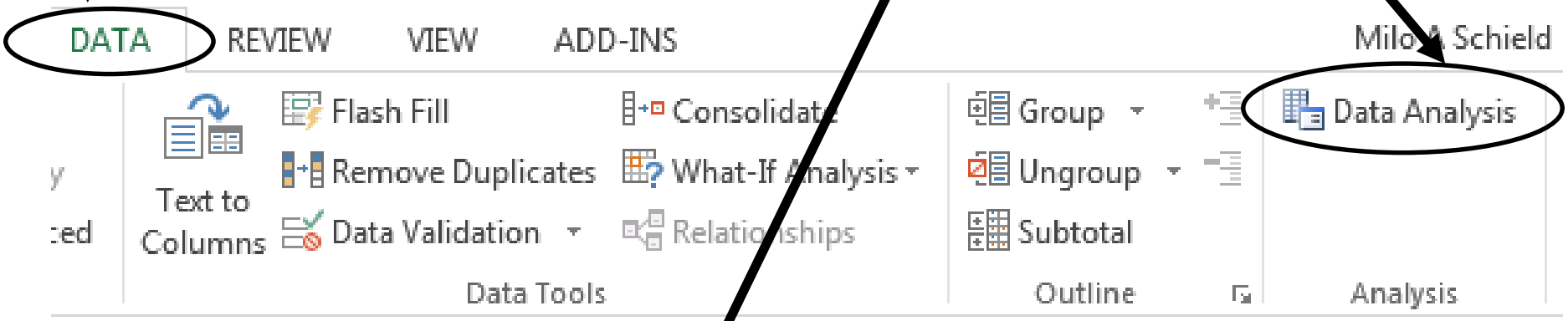
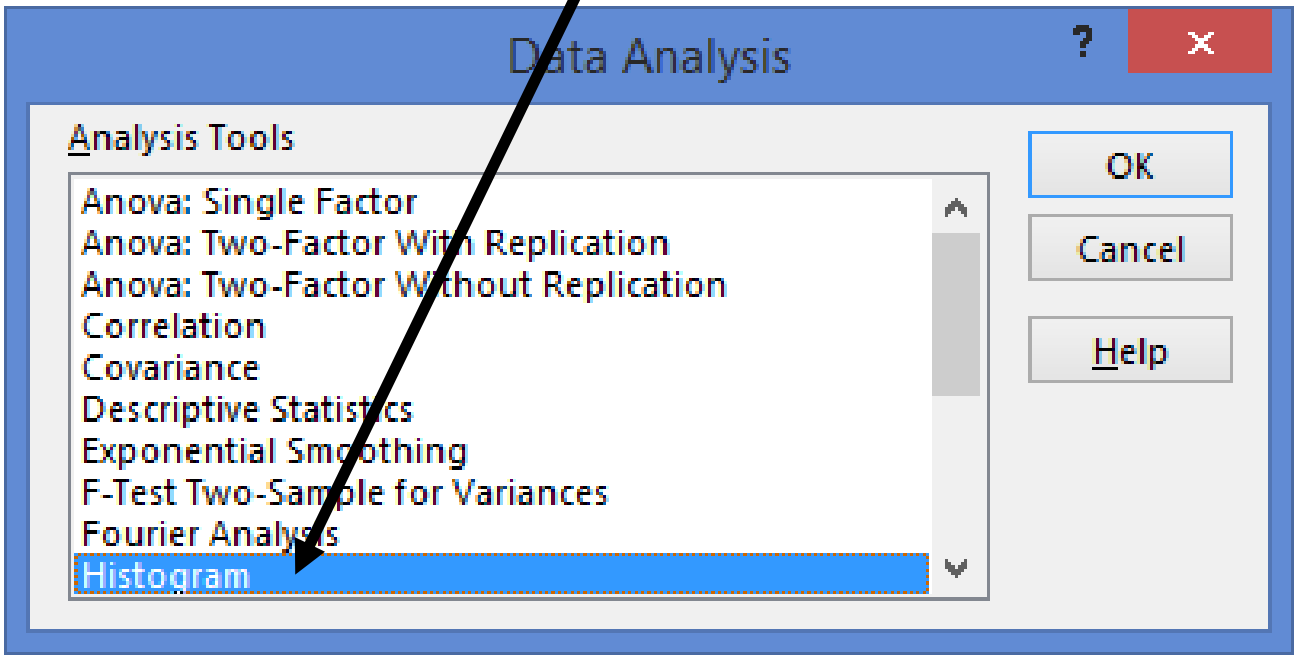
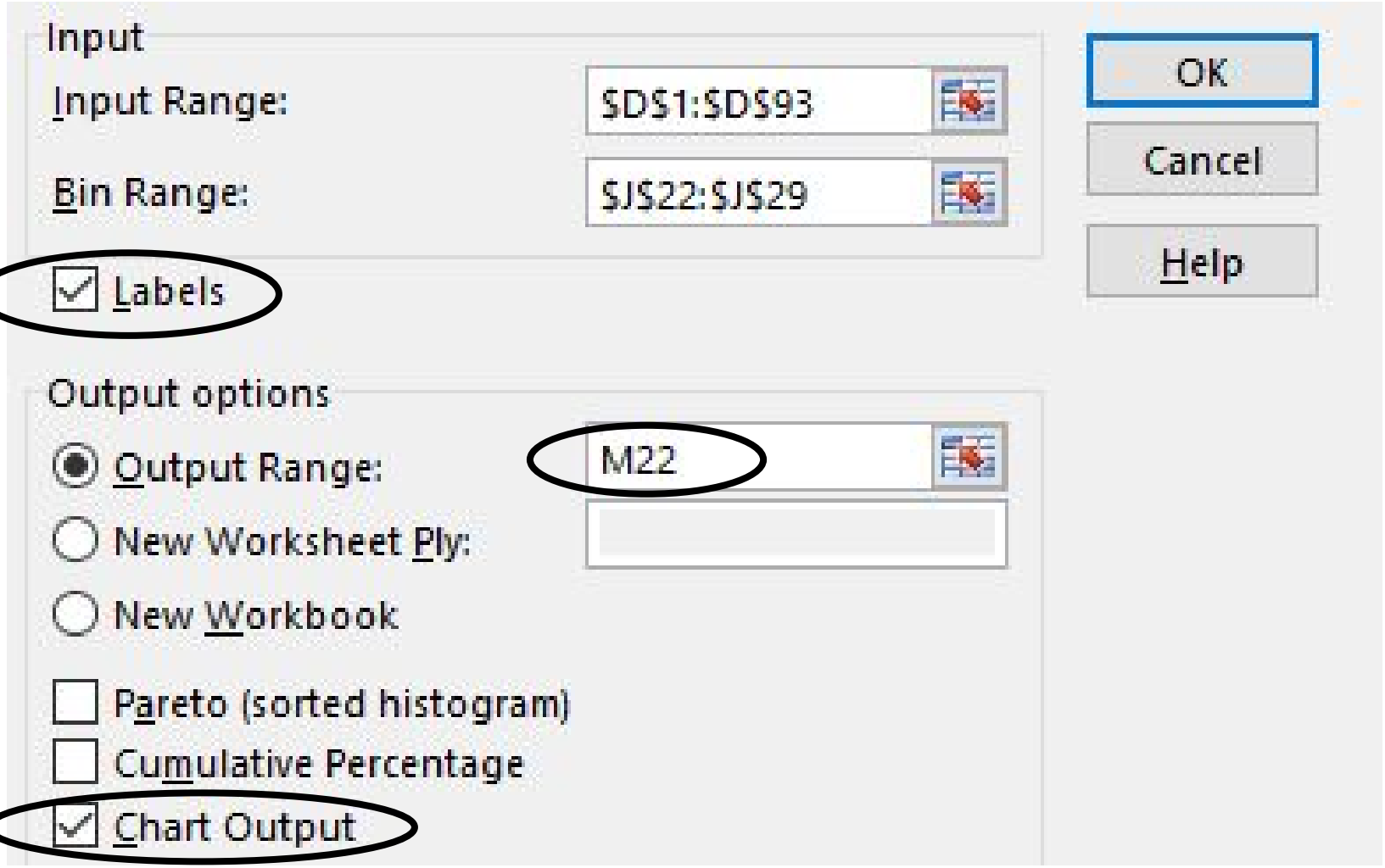
1: Data tab: Select "Analysis" Select Histogram



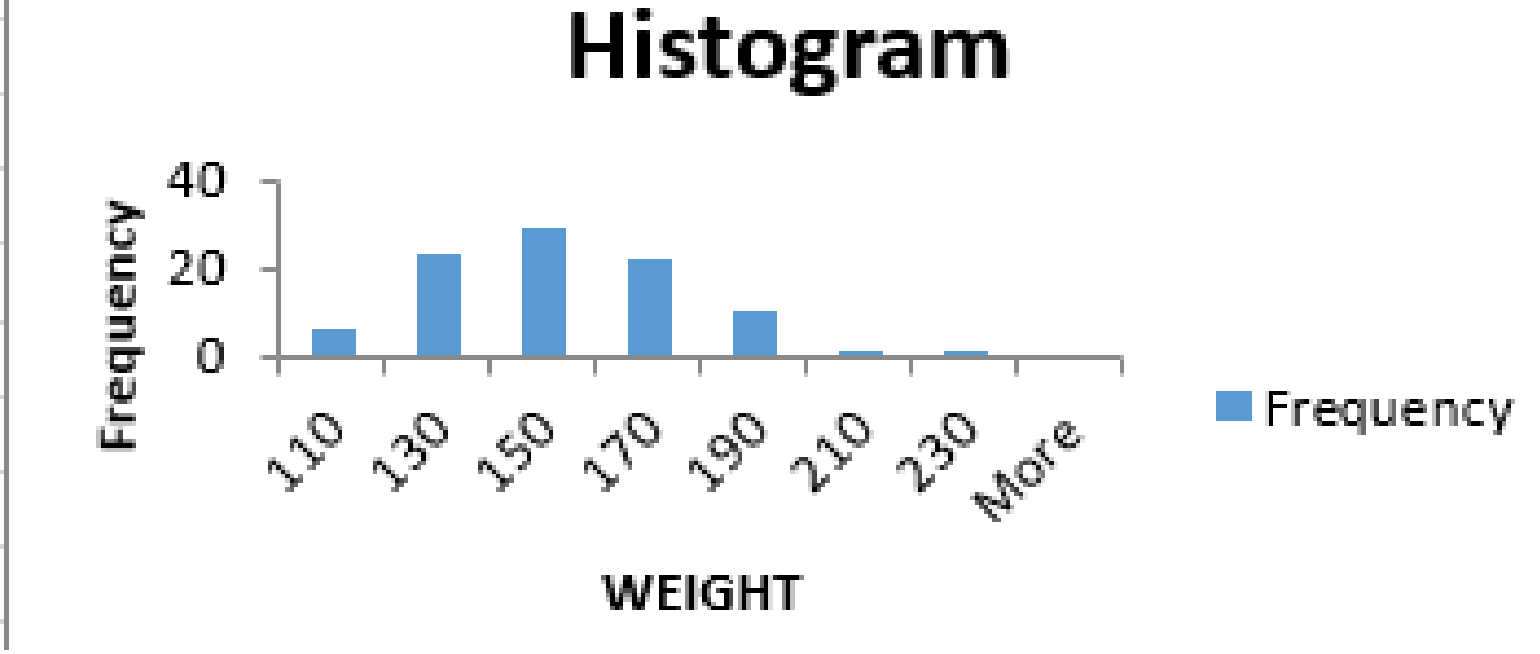


2a: Enter Data, Bin Maximums Output Range & Chart Output



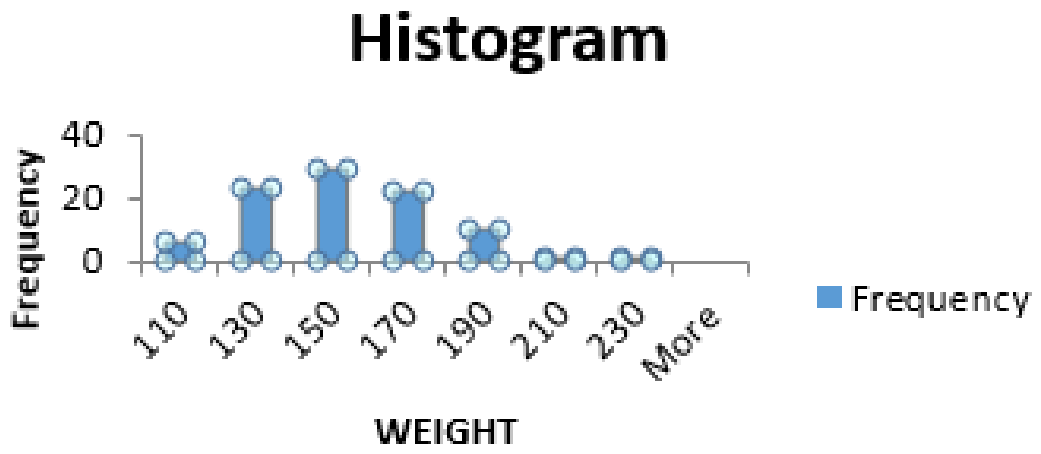
2b: Generate table and chart. Move chart on top of table

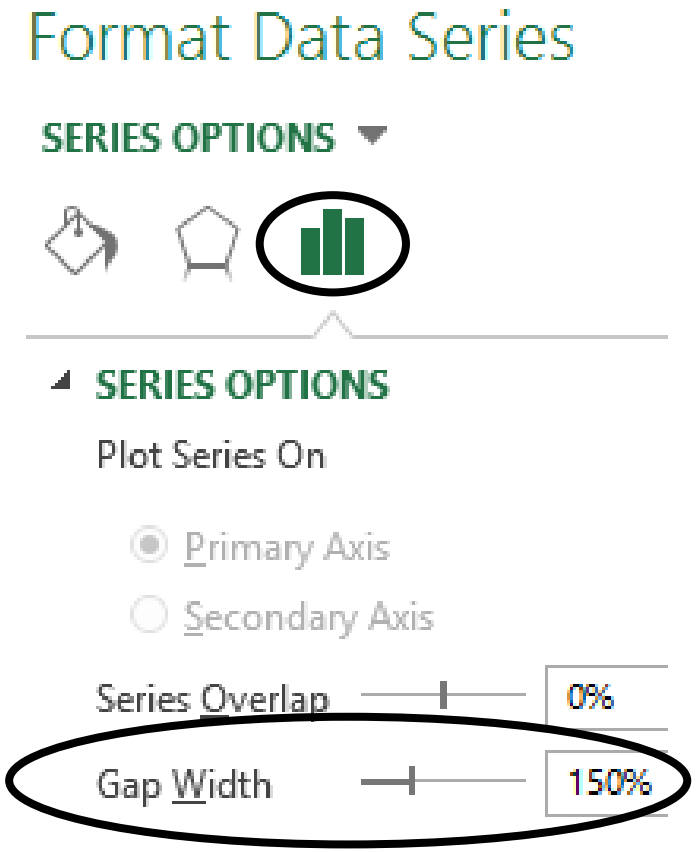
22	WEIGHT		*WEIGHT*	*Frequency*
23	110		110	6
24	130		130	23
25	150		150	29



3a: Right-Mouse a column bar; Select "Format Data Series"

	110	Max 1st bin (Manual)	
WEIGHT		*WEIGHT*	*Frequency*
110		110	6
130		130	23
150		150	29





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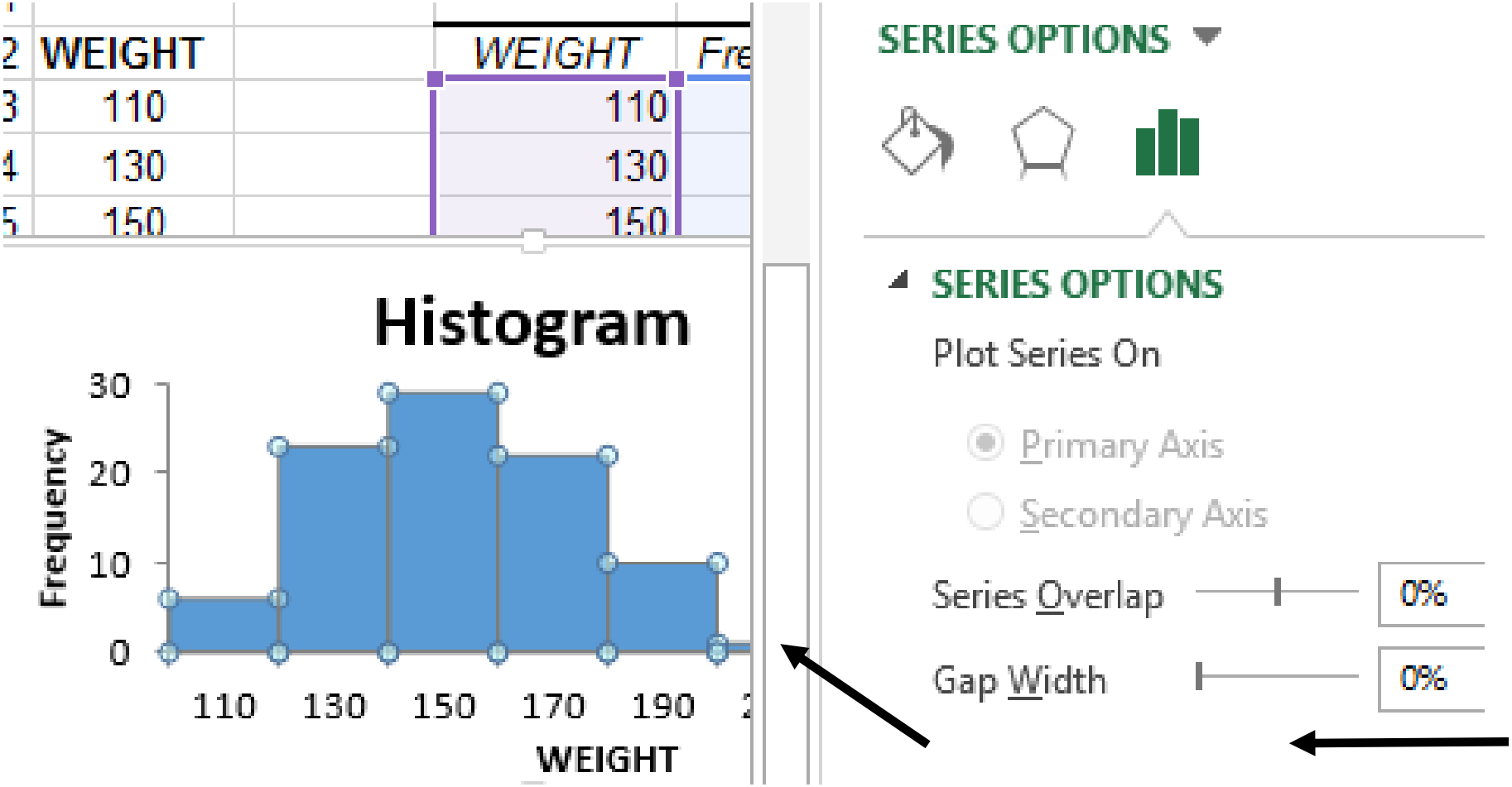
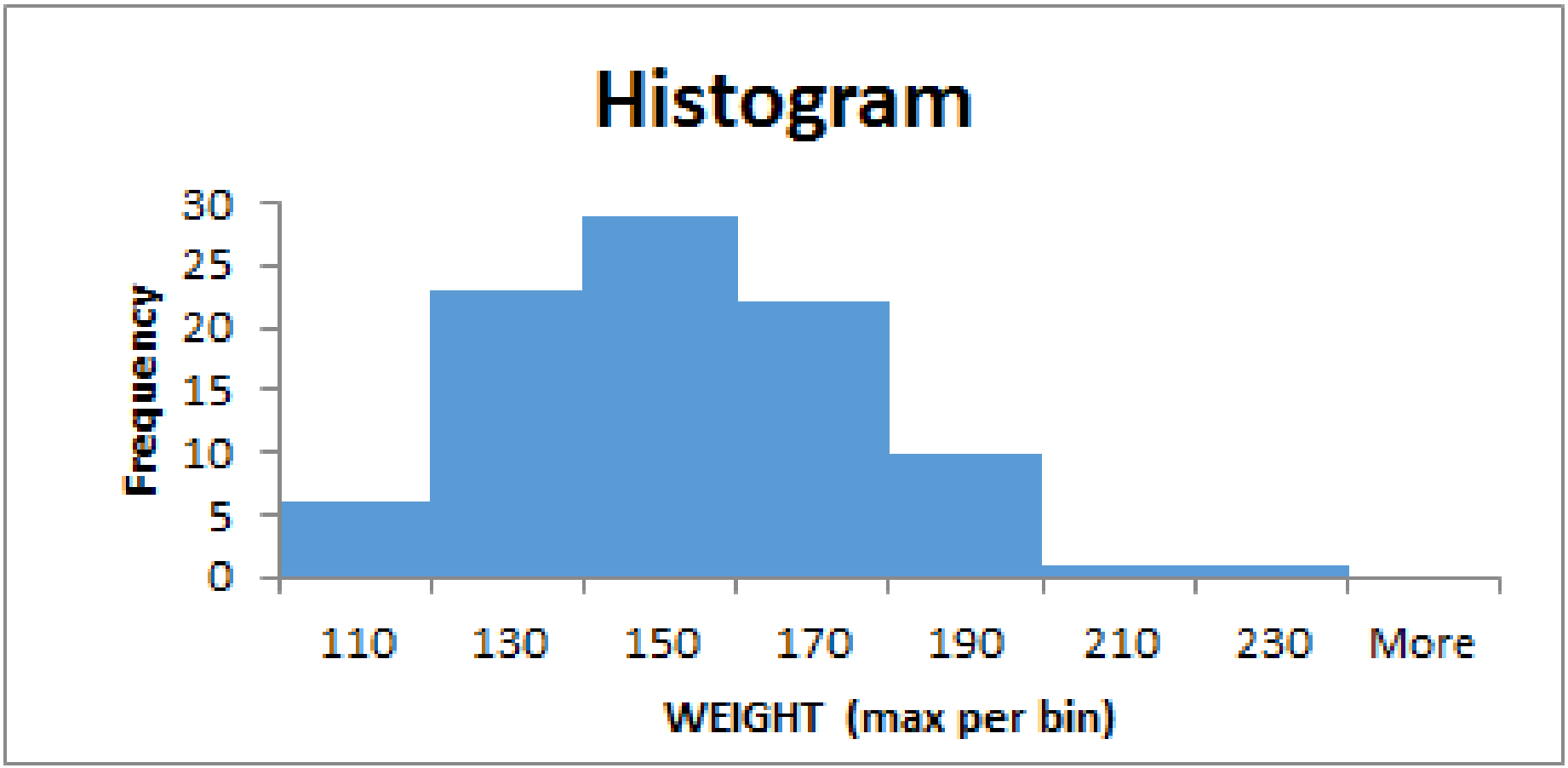


Conclusion

Histograms display continuous data properly!



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