

Exploring Statistics Using Fathom Graphical Methods for Displaying Data

Setting Up the Data:

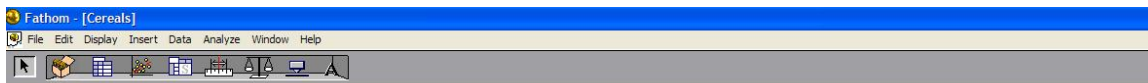
1. Create or open your collection of data.

You can do this by

- (a) dragging a web site URL into an empty Fathom worksheet,
- (b) importing a tab-delimited text file,
- (c) copying from a spreadsheet and pasting cases (through the file menu) into an empty collection, or
- (d) typing in the data by hand.

2. Open a Case Table with the data in it by

- (a) Click once on the Collection Box to make sure it's highlighted.
- (b) Select and drag the case table icon from the menu into the page.
- (c) Adjust the window size so you can see all of the attribute titles if possible.



	name	mfr	type	calories	protein	fat	sodium	fiber	carbo	sugars	potass	vitamins	shelf	weight	cups	rating
1	100%_Br...	N	C	70	4	1	130	10	5	6	280	25	3	1	0.33	68.403
2	100%_N...	Q	C	120	3	5	15	2	8	8	135	0	3	1	1	33.9837

Displaying Categorical Data:

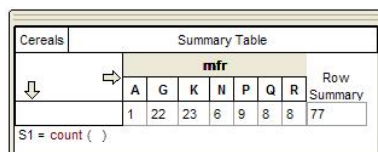
- Frequency Tables

1. Drag a Summary Table into your worksheet.
2. Drag an (Categorical) Attribute name into either the horizontal or vertical box pointed to by an arrow.

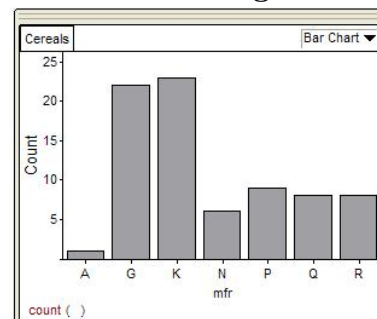
- Bar Charts

1. Drag an empty Graph into your worksheet.
2. Drag an (Categorical) Attribute name into the area immediately below the horizontal axis.

Frequency Table for Categorical Data Bar Chart for Categorical Data



Cereals		Summary Table						
		mfr						Row Summary
		A	G	K	N	P	Q	R
		1	22	23	6	9	8	8
S1 =	count ()							77



Displaying Numerical Data:

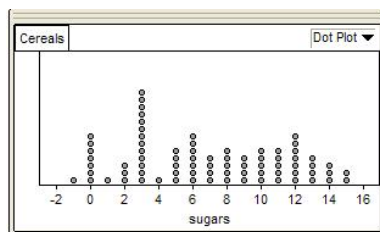
- Dot Plots

1. Drag an empty Graph into your worksheet.
2. Drag an (Numerical) Attribute name into the area immediately below the horizontal axis.
3. If data doesn't show up as a dot plot to start, select "Dot Plot" from the upper right hand corner menu.

- Frequency Tables

1. For integer data with relatively few different values.
 - (a) Drag an empty Summary Table into your worksheet.
 - (b) Drag an (Numerical) Attribute name into the horizontal or vertical box pointed to by an arrow **while pressing the SHIFT key**.
2. For non-integer data or integer data with many different values. – NOTE: You will have to "bin" the data first, describing interval values to group the data into first.
 - (a) Add a new Attribute in your Collection under the Cases tab. Call it BinnedData (or something descriptive).
 - (b) Right click on this attribute name and select the Edit Formula option.
 - (c) In the rectangular box at the top, type `bin(Attribute name, width of bin , min value, max value)` and return.
 - (d) Drag an empty Summary Table into your worksheet.
 - (e) Drag the newly BinnedData Attribute name into the horizontal or vertical box pointed to by an arrow. Note, our category names aren't as helpful here. By default, our bins are labelled "b1", "b2", etc. for Bin 1, Bin 2, where the bins are in increasing order.

Dot Plot of Numerical Data Frequency Table for Numerical Data



Cereals		Summary Table					
		BinnedSugars					Row
		b1	b2	b3	b4	b5	Summary
		9	22	20	21	5	77
		S1 = count ()					

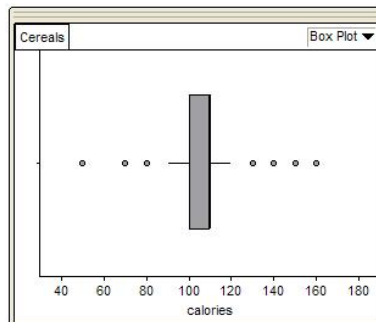
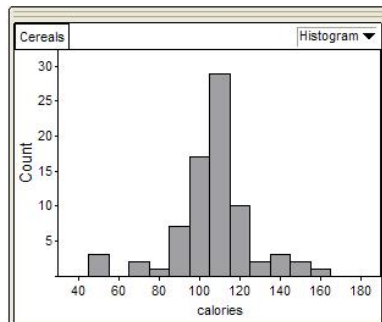
- Histograms

1. Drag an empty Graph into your worksheet.
2. Drag an (Numerical) Attribute name into the area immediately below the horizontal axis.
3. Select Histogram from the menu in the upper right hand corner.
4. NOTE: You can change bar widths by placing your cursor over the edge of a bar until it becomes a \leftrightarrow . Hold the left mouse button down and adjust the width. If you right click over the histogram and select Show Graph Data, you can change the bar width by typing over the bar width value and hitting enter.
5. NOTE: You can generally switch vertical axis values from count (i.e. frequency), to relative frequency, and to density. To do this, click on the graph window, then go to the Graph menu above and the Scale submenu.

- Box plots

1. Drag an empty Graph into your worksheet.
2. Drag an (Numerical) Attribute name into the area immediately below the horizontal axis.
3. Select Box Plot from the menu in the upper right hand corner.

Histogram of Numerical Data Box Plot of Numerical Data ¹



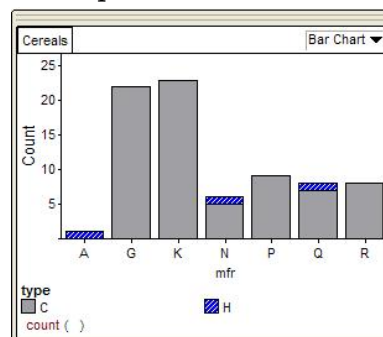
Displaying Bivariate Data:

- Displaying Bivariate Categorical Data:

- Comparative Frequency Tables
 1. Drag a Summary Table into your worksheet.
 2. Drag an (Categorical) Attribute name into either the horizontal or vertical box pointed to by an arrow.
 3. Drag a second (Categorical) Attribute name into the other box (horizontal or vertical).
- Bar Charts
 1. Drag an empty Graph into your worksheet.
 2. Drag an (Categorical) Attribute name into the area immediately below the horizontal axis.
 3. Drag a second (Categorical) Attribute name onto a bar of the existing bar chart.

Frequency Table Bivariate Categorical Data Comparative Bar Chart

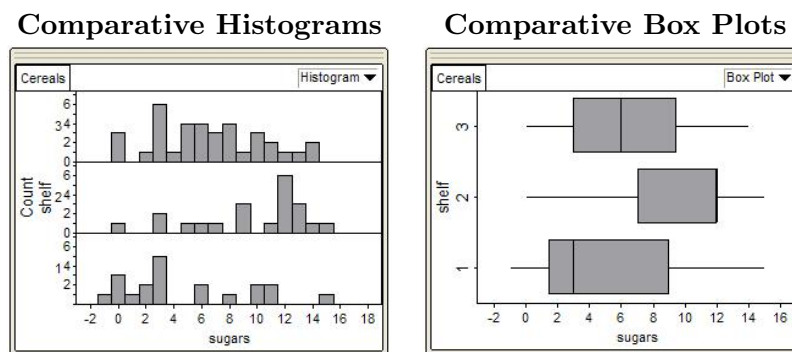
Cereals		Summary Table							
		mfr							Row Summary
		A	G	K	N	P	Q	R	
type	C	0	22	23	5	9	7	8	74
	H	1	0	0	1	0	1	0	3
Column Summary		1	22	23	6	9	8	8	77



¹NOTE: For report purposes, you can get versions of your graphs into a Word Document by the following steps:

1. Capture an image of this window on a PC by pressing the ALT key at the same time as the Print Screen key.
2. Paste this into Paint (under Programs → Accessories).
3. Crop to appropriate size and paste into Word.

- Displaying Bivariate Mixed Categorical and Numerical Data:
 1. Comparative Frequency Tables
 - (a) Follow the instructions for creating frequency tables of numerical data given in .
 - (b) Drag a Categorical Attribute onto the box not chosen for the Numerical Attribute.
 2. Comparative Histograms
 - (a) Drag an empty Graph into your worksheet.
 - (b) Drag an Numerical Attribute name onto the area immediately below the horizontal axis.
 - (c) Drag a Categorical Attribute name onto the area immediately to the left of the vertical axis.
 3. Comparative Box plots
 - (a) Drag an empty Graph into your worksheet.
 - (b) Drag an (Numerical) Attribute name into the area immediately below the horizontal axis.
 - (c) Select Box Plot from the menu in the upper right hand corner.
 - (d) Drag a Categorical Attribute name onto the area immediately to the left of the vertical axis.



- Displaying Bivariate Numerical Data Scatterplots
 1. Drag an empty Graph into your worksheet.
 2. Drag a Numerical Attribute name onto the area immediately below the horizontal axis.
 3. Drag a Numerical Attribute name onto the area immediately to the left of the vertical axis.

