

Math 21 – Pointers for Section 2.2

Graphical Techniques for Discrete Data

Section 2.2 covers graphical representation of quantitative (numerical) data, and the section is broken into two halves: graphical techniques for discrete data and graphical techniques for continuous data. In these pointers I will cover the techniques that we use for discrete data.

Recall that data are discrete if there are gaps between possible values. In most cases these data are whole numbers only that result from counting.

Frequency Distribution

A frequency distribution is a table that lists each value with its frequency. One difference when working with discrete data than with categorical data is that you must list every possible value between the minimum value and the maximum value, even if its frequency is 0.

Relative Frequency Distribution

To make a relative frequency distribution, start with a regular frequency distribution. Divide each frequency by n (the sample size) to find the relative frequency.

StatCrunch

- To make a frequency distribution in StatCrunch, type the data in 1 column (1 value per line).
- Click on Stat > Tables > Frequency.
- Select the column containing the data.
- Frequency and relative frequency are pre-selected by default, if you only want one you will have to select that one.
- Click on “Compute!”

Histogram

A histogram is like a bar graph for numerical data, with a couple of changes.

First, the x-axis will follow a numerical scale like a number line.

Second, there are no gaps between the bars.

The histograms done by our author for discrete data look slightly different than the ones that StatCrunch will make.

By Hand

To make a histogram, begin by looking at your frequency distribution.

The frequencies go on the y-axis, and be sure that your axis must go up to your highest frequency.

List each value from the minimum to the maximum along the x-axis.

Draw a bar above each value to the height of its frequency.

The value should be at the center of the bar. If the value is 2, the bar should extend to 1.5 on the left and 2.5 on the right. The bar for $x = 3$ should extend from 2.5 to 3.5, and so on.

Again, there should be no gap between the bars, and the bars should have the same width.

By Technology

When we use StatCrunch, the bar for $x = 2$ will start at 2 on the left and extend to 3 on the right.

The bar for $x = 3$ will extend from 3 to 4, and so on.

In other words, the value is on the left side of the bar and not in the center as it is when we do it by hand.

The shape for these two techniques will be exactly same, just the labels on the x-axis will vary.

StatCrunch – With Discrete Data

Here is how to make a histogram when you have the list of actual data.

- Type the data in 1 column (1 value per line).
- Click on Graph > Histogram.
- Select the column containing the data.
- For Type, choose between frequency and relative frequency.
- For “Width” type 1.
- Select “Value above bar” under “Display”.
- Click on “Compute!”

StatCrunch – With a Summary of the Data

Here is how to make a histogram when you have a summary of actual data, like

<i>Value</i>	<i>Frequency</i>
<i>1</i>	<i>9</i>
<i>2</i>	<i>5</i>
<i>3</i>	<i>4</i>
<i>...</i>	

This will look like the ones our author does by hand.

- Type the values in 1 column (1 per line), with the frequencies next to them in the next column.
- Click on Graph > Bar Plot > with summary.
- Categories: Select the column containing the values.
- Counts: Select the column containing the frequencies.
- For Type, choose between frequency and relative frequency.
- Select “Value above bar” under “Display”.
- Click on “Compute!”