Statistics with Microsoft Excel

Excel is one component of the Microsoft Office Suite of useful software programs. This appendix is oriented toward entering data into an Excel spreadsheet, entering formulas for a variety of numerical statistics, and constructing a variety of statistical graphs.

Data Entry:

Cells can hold text, numbers, a combination of the two, or formulas.

Each cell is named with a column letter then a row number (e.g., the A1 cell describes the cell in the A column and row 1).

There are several ways to navigate around the spreadsheet. You can use arrow keys (right→, left ←, down ↓, up ↑); you can use your mouse and a single click to select a certain cell; and you can use the tab key, shift + tab, return, or shift + return to move right, left, down and up.

There are ways to change font, font size, font color, make letters bold, italic, or underlined, center- or left- or right-justify content, round numbers up or down, etc. Excel is similar to any word processing software in many of these features.

You can also change the width of a column by clicking on the border between columns and dragging right or left.

These are recent golf scores for Andy Taylor and Barney Fife:

| Andy | 78 | 83 | 81 | 84 | 80 |
| Barney | 82 | 92 | 74 | 100 | 78 |

Enter this data into Sheet 1 of the Excel spreadsheet, then click on Sheet 2 (in the bottom left), and enter the battery life data given below into columns A, B, and C. Then click on Sheet 3, and enter the 1912 presidential election data given below into columns A, B, C, and D.

Hours	Hours	Frequency
35 - 37	34.5 - 37.5	5
32 - 34	31.5 - 34.5	8
29 - 31	28.5 - 31.5	8
26 - 28	25.5 - 28.5	3
"classes"	"boundaries"	24

Sheet 2

1912 Presidential Election Results

|	Electoral Vote	Popular Vote
Woodrow Wilson	435	6,286,214
Theodore Roosevelt	88	4,126,020
William Taft	8	3,483,922
	531	13,896,156

Sheet 3

There are several ways to format the cells, and you may want to explore a variety of options. Under "Format" on the menu bar there is an "AutoFormat" feature that does several formatting options automatically for you. Proficient users of Excel have the capability of making truly **EXCEL**LENT, visually appealing presentations!

Entering a formula command:

First select the cell location for the formula (and the answer).

Statistics with Microsoft Excel

The f_x button gives a long list of functions with the expected format, grouped by several categories such as "Most Recently Used", "Statistical", "Math & Trig", and a few others. Click on this button if you're uncertain of the function name or its format.

Many statistical functions have the following general format: =FUNCTION(firstcell:lastcell)

For example, if we entered Andy's golf scores in the B2, B3, B4, B5, and B6 cells of Sheet 1, we would use the following commands to find the following important numerical statistics.

Statistic	Format for Command
Sum	=SUM(B2:B6)
Mean	=AVERAGE(B2:B6)
Mode	=MODE(B2:B6)
Median	=MEDIAN(B2:B6)
Midrange	=(MAX(B2:B6)+MIN(B2:B6))/2
Range	=MAX(B2:B6)–MIN(B2:B6)
Sample standard deviation	=STDEV(B2:B6)
Population standard deviation	=STDEVP(B2:B6)

The formulas for Barney would be identical once each B is replaced by a C in the commands above. For Andy and Barney, we would choose to use the sample standard deviation formula since they would be likely to play both before and after these 5 rounds of golf. Both the mean and standard deviation values are typically rounded to the nearest tenth's place. The "#N/A" is an Excel indicator of no solution. Rather than type the command, the Σ button automatically places the sum command in a cell. For your convenience, we show the column letters and row numbers in the figure below.

Note: Data can be placed in rows or columns, and formulas can be placed in any cell. There are also "Fill" command shortcuts (under Edit) that can make multiple calculations quite efficient.

	A	B	C
		Andy	**Barney**
1			
2		78	82
3		83	92
4		81	74
5		84	100
6		80	78
7	**Sum**	406	426
8	**Mean**	81.2	85.2
9	**Mode**	#N/A	#N/A
10	**Median**	81	82
11	**Midrange**	81	87
12	**Range**	6	26
13	**St. Deviation**	2.4	10.6

Statistics with Microsoft Excel

Constructing statistical graphs:

First select (with a click and drag) the cells that contain data you want included in the graph.

Next, click on the Chart Wizard icon.

The bar graph choices include a "column graph" (with vertical bars for a particular variable corresponding to frequencies) and a "bar graph" (with horizontal bars for a particular variable corresponding to frequencies). There are also broken line graphs, pie charts (circle graph), and scatter plots (under XY (Scatter)). These are the "common five", but there are a whole host of other interesting graphs from which to choose. Once a "Chart type" is picked, there are several 2- and 3-dimensional "Chart sub-types".

Then follow the directions through several stages. Click on Next to advance to the next choice (you're fine-tuning the graph), and click on Finish to take your impressive graph back to the worksheet.

You can move your graph by clicking on the graph and dragging. You can resize your graph by clicking on a border button on the graph and dragging. You can also change fonts, colors, borders, backgrounds, and other features of the graph. The sky's the limit!

In Sheet 2, we'll have the software make a histogram for the battery life (in hours) data.
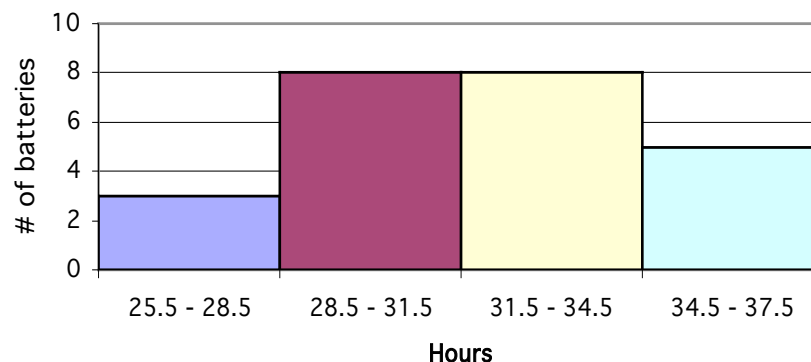
The key is to start with a bar graph, double click on one of the bars, then click on the Options tab, and make the gap width 0. You may also choose to "Vary colors by point".

Your final results may look like this:

Hours	Frequency
25.5 - 28.5	3
28.5 - 31.5	8
31.5 - 34.5	8
34.5 - 37.5	5

Battery Life

3

Statistics with Microsoft Excel

All of the statistical graphs involve similar steps.

In Sheet 3, we'll have the software make a circle graph for the 1912 presidential election data.

You may input the entire data set, but we'll select only columns for the candidates and the electoral vote count for the first graph, and we'll select only columns for the candidates and the popular vote count for the second graph

The stages in the Chart Wizard involve fewer options (since there are no axes to label). Here, we recommend including percents and including values or a legend to make clear which piece goes with which candidate for U.S. President.

Your final results may look like this:

1912 Presidential Election Results

	Electoral Vote	Popular Vote
Woodrow Wilson	435	6,286,214
Theodore Roosevelt	88	4,126,020
William Taft	8	3,483,922
	531	13,896,156

1912 Presidential Election—Electoral Vote
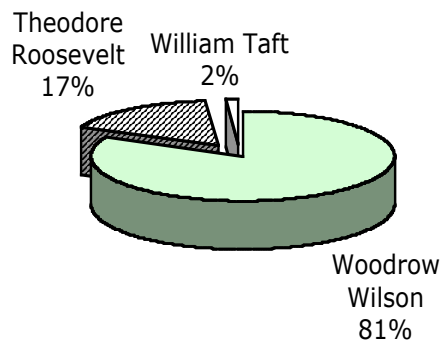
1912 Presidential Election—Popular Vote

4