

Using Excel, Chapter 2: Descriptive Statistics

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Individual Descriptive Statistics using Excel Functions

- **Averages:**

- The mean is calculated using the `AVERAGE(cell range)` function.
- The median is calculated using the `MEDIAN(cell range)` function.
- The mode is calculated using the `MODE(cell range)` function.

- **Range, Variance, and Standard Deviation:**

- The range is calculated using the `MIN` and `MAX` functions.
- The sample variance is calculated using the `VAR.S` or `VAR` (older versions) function.
- The sample standard deviation is calculated using the `STDEV.S` or `STDEV` (older versions) function.
- The population variance and standard deviation are calculated using the `VAR.P` and `STDEV.P` functions respectively.

- **Percentiles & Quartiles**

- The k^{th} percentile is found by $P_k = \text{PERCENTILE}(\text{Data Range}, k \text{ in decimal form})$
- The first quartile (Q_1) is found by `PERCENTILE(Data Range, 0.25)`
- The the third quartile (Q_3) is found by `PERCENTILE(Data Range, 0.75)`

- **Box-Plots and 5-Number Summaries:**

Excel is terrible with box-plots. There are various add-in's you can find. I find the easiest method is to grab a free-use template from the internet. There are many. Just search *boxplot Excel Version*. You enter the data into the correct location and a graph of the box-plot is made via a sequence of non-standard graphing tricks.

There is no single command to get Excel to make a 5-number summary but you can piece it together pretty easily.

5-number summary: Excel Commands	
min	<code>MIN(Data Range)</code>
Q_1	<code>PERCENTILE(Data Range, 0.25)</code>
Q_2	<code>MEDIAN(Data Range)</code>
Q_3	<code>PERCENTILE(Data Range, 0.75)</code>
max	<code>MAX(Data Range)</code>

• A Summary of Descriptive Statistics Using the Analysis ToolPak Windows Users Only

The Data Analysis ToolPak is available for free to all Windows versions of Excel. It is not available to Mac users. Installation directions are on the last page of this document. It provides a nice way to create a complete table of valuable statistics. Once you've added this package, go to the far right tab and click

1. Click the **Data** tab.
2. Click the **Data Analysis** option on the far right.
3. Choose **Descriptive Statistics**
4. A dialogue box will open.
5. Place cursor in the **Input Range** box and select the data by highlighting it.
6. Check **Labels in the First Row** if that is the case.
7. Select **Output Range** and choose a location for the output by clicking on a cell in the worksheet.
8. Check the box **Summary Statistics**
9. Click **OK**
10. You will get an output table of summary statistics like the ones below.

<i>Test Scores: Males</i>		<i>Test Scores: Females</i>	
Mean	73.5	Mean	74.4
Standard Error	2.46	Standard Error	2.34
Median	76	Median	74
Mode	93	Mode	79
Standard Deviation	15.9	Standard Deviation	12.8
Sample Variance	253.2	Sample Variance	164.9
Kurtosis	-0.67	Kurtosis	-0.74
Skewness	-0.37	Skewness	-0.04
Range	60	Range	49
Minimum	37	Minimum	49
Maximum	97	Maximum	98
Sum	3086	Sum	2232
Count	42	Count	30

Note: Excel will violate the round-off rule almost every time. You'll have to edit this by right clicking on the cell then:

format → number → the appropriate number of decimal places

- **A Summary of Descriptive Statistics Using StatPlus Mac Users Only**

The Analysis ToolPak which comes free with every Windows version of Excel is not available for Mac Excel. There is an application called

StatPlus:Mac LE (<http://www.analystsoft.com/en/products/statplusmacle/>).

This is a free version of the full StatPlus application. It is actually better than the Analysis ToolPak but you have to run it alongside Excel as opposed to directly within Excel. So you have to get accustomed to running them simultaneously. Once you have downloaded the software, you can get a nice summary of descriptive statistics by following the sequence below.

1. Run StatPlus from the Applications folder. It automatically opens Excel.
2. Click Statistics.
3. Choose Basic Statistics and Tables.
4. Choose Descriptive Statistics.
5. Select the range of cells in which the data lies.
6. Check *Labels in first row* only if you highlighted the column headings.
7. Click 'OK'.
8. The results are printed on a separate StatPlus page.
9. You can cut and paste the results back into your Excel spreadsheet if you want.

- Getting and Running the Analysis ToolPak and StatPlus LE

- **Installing Analysis ToolPak** (Windows Only)

1. Open a blank Excel spreadsheet.
2. Click on the windows icon (pre 2010) or the file tab (2010+).
3. Choose Excel Options (pre 2010) or just options (2010+).
4. Choose add-ins.
5. In manage (bottom of window), choose Excel Add-ins and click Go.
6. Check the box that says Analysis ToolPak and click OK.
7. After you load the Analysis ToolPak, the Data Analysis command is available under the Data tab. It should be the far right option.

- **Getting StatPlus LE** (Mac Only)

As of this writing, if you are running Excel 2008 or higher on a Mac, the Analysis ToolPak is not available. There is an application called StatPlus:mac LE which is a free version of the full StatPlus application. It can handle most of the tasks performed by the Analysis ToolPak and the full version is probably superior - but that costs money.

Once you download the software from <http://www.analystsoft.com/en/products/statplusmacle/>,

1. Run StatPlus from the Applications Folder.
2. If you don't already have Excel open, it will open it for you.
3. You will run the commands from the StatPlus menu (top menu bar).
4. Choose the appropriate cells from the Excel worksheet containing the data.
5. The results are printed to a separate Excel worksheet.
6. You can then cut and paste these results in the Excel Worksheet that contains the data.