Student Self-Guided Worksheet to Working with Data in Excel

Finding Data and Importing Data into Excel

At <u>Data.gov</u>, search "shoes." Note that the available datasets are very limited, but note the format of the available datasets. The comma-separated value (CSV) format, a file format for organized data, most easily incorporates into Excel. Download the *Columbus Avenue BID Businesses* CSV file by clicking on the CSV icon below its description and opening the file with Excel. (Tip: You may have to drag the file to an Excel worksheet or change the format in the Excel open menu from *All Excel Files* to *Text Files*. You can also import the data using the menu *Data > From Text*.) Data is organized by columns. Columns can be resized to fit the data.



Name:	Date:	Class:

- 2. Obtain and import data using the following search engines and databases (use a new tab for each search): data.gov, konect, reddit, refdesk, Internet public library, iTools, Dmoz.org, Encyclopedia.com, Reference.com, Lifewire, and datahub.io (Tip: It is unlikely that a search will immediately give you formatted, packaged and relevant data. Try varying your search terms and exploring available data that is related to the search. For example, searching the term "shoe" does not immediately yield data related to shoe consumption or preferences. However, a search for "disposable income" may yield Census data with population demographics that may lead to pertinent and useful trends and results.)
- 3. Use the Knoema Data Finder plug-in to find data. Here, a direct search of "shoes" yields a table of planned monthly spending on shoes.

How to add Knoema to Excel:

- 1) <u>Download</u> the app > go to the File tab > click Options > click Add-Ins.
- 2) In the Manage box > click COM Add-ins > click Go.
- In the Add-ins available box > select the check box next to Knoema (or Add it first, if it's downloaded but not listed)

How to use Knoema Data Finder:

- 1) Click the Add-Ins tab
- 2) Click the Find data icon
- 3) Type your query in the box in place of Search for data and statistics.

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										90-Day Monthly Planned Spending Score for Shoes	
										Time: 2012 Nov-2016 Jan (Monthly)	
										Shoes - Russia	
										Source: Russian monthly economic indicators, September 2013	
										Time: 1993 Jan-2013 Jul (Monthly)	
										Shoes (2 indicators)	
										Time: 2016 (Annual)	
										Vietnam - Fabric shoes	
										Time: 1995-2015 (Annual)	
										Tunisia - Shoes uppers	
										Source: Tunisia Foreign Trade, 2014 Time: 1993-2014 (Annual)	
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How to obtain data via Excel's *Data > From Web* command.

- 1) Use an Internet browser to find a website that hosts numeric data in tabular form. One example, shown below, is <u>ESPN's MLB Player Batting Stats 2017 page</u>.
- 2) Copy the website's URL from the browser address bar.
- 3) In Excel > go to the Data tab > select From Web (left of the menu, shown below)
- 4) Paste the URL into the *Address* in the *New Web Query* form > click Go.

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5) Click OK to import the data into the existing Excel worksheet. Notice that the data includes lots of extraneous information, as shown in the next image:

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1	MLB Statistics - 2016					
2						
3	Season:					
4						
5	All-Time Historical Stats »					
6	MLB WAR Leaders »					
7	Stats Resources »					
8	Sabermetric Stats »					
9	History of the MLB »					
10						
11	Sortables					
12						
13	ALL MLB		AMERICAN LEAGUE		NATIONAL LEAGUE	
14	Player Batting	Team Batting	Player Batting	Team Batting	Player Batting	Team Batting
15	Player Pitching	Team Pitching	Player Pitching	Team Pitching	Player Pitching	Team Pitching
16	Player Fielding	Team Fielding	Player Fielding	Team Fielding	Player Fielding	Team Fielding
17						
18	American League Leaders					
19						
20	AL BATTING AVERAGE		AVG			
21	Jose Altuve	1. Jose Altuve, HOU	0.338			
22	Jose	2. Mookie Betts, BOS	0.318			
23	Altuve	2. Dustin Pedroia, BOS	0.318			
24		Miguel Cabrera, DET	0.316			
25		5. Mike Trout, LAA	0.315			
26	Complete Leaders					
27						
28	National League Leaders					
29						
30	NL BATTING AVERAGE		AVG			
31	DJ LeMahieu	1. DJ LeMahieu, COL	0.348			
32	LI	Daniel Murphy, WSH	0.347			
33	LeMahieu	3. Joey Votto, CIN	0.326			
34		4. Charlie Blackmon, COL	0.324			

6) You can "Clean" the data by hiding (or deleting, with caution) rows or columns that repeat or are irrelevant. Go to the *Data* tab > click the *Remove Duplicates* button > click *Select All* > click *OK*. Manually hide remaining irrelevant text and information by selecting the rows or columns: right-click > select *Hide*. Save your progress for the next section.

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		25	21	J.T. Real	Im MIA	0.30	7 33.	3 4.80	5 0.112	0.159	111	99	1.12	62.8	0.038	0.23				
		26	22	Robinso	on SEA	0.30	5 60.	5 6.98	3 0.241	0.315	120	154	0.78	17.1	0.071	0.49				
		27	23	Eric Hos	m KC	0.30	5 5	2 6.4	7 0.185	0.292	138	96	1.44	24.8	0.088	0.44				
		28	24	Charlie	BICOL	0.30	5 49.	2 7.03	3 0.205	0.313	79	141	0.56	21.6	0.086	0.58				
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4. Explore your own searches using the given tools.

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Formulate Product Plan and Gather Data

This includes: Identify a product. Determine at least five variables related to the product's production, marketing and sales. Search for data using a variety of search resources and search terms. Import relevant data into Excel. Keep records of the data source URLs.

Analyzing Data with Excel

Practice inserting a scatter plot of related columns of data in order to analyze their relationship by inserting a trend line and viewing the coefficient of determination (R^2). These tools enable a visual analysis and provide a statistic of the correlation between the data, which show the strength of their interrelation.

Open the Excel file from the earlier importing data exercise (or ask the teacher for access to the *ESPN Example* file). Select the first column (or row) of data by clicking and highlighting just the data values, or by selecting the row or column header at the top. Then hold down the control key (*Ctrl*, usually near the space bar on the keyboard) while selecting the second row or column of data. As an example, select columns D (AVG) and I (GB) > go to the *Insert* menu > select *Scatter* > select the *Scatter with only Markers* option > move the chart to a blank, open area in the Excel sheet.

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	4	2	Daniel Mu	WSH	Compar	e pairs of val	ues.		1038		94	171	0.55	21.1	0.053	0.52	
	5	3	Xander Bc I	BOS	Use it w	hen the value	es are not ir				135	135	1	35.8	0.077	0.51	
	6	4	Wilson Ra	WSH	x-axis or	der or when	they repres	ent 🦯			113	93	1.22	19.6	0.074	0.61	
	7	5	David Orti I	BOS	separate 0.000	07.4					80	140	0.57	14.4	0.141	1.08	
	8	6	Manny Ma	BAL	0.334	66	8.49		hart Types.		90	156	0.58	16.8	0.081	0.47	
	9	7	Starling MI	PIT	0.331	50	6.85	0.162	0.2	48	106	109	0.97	46.3	0.03	0.14	
	10	8	Carlos Gor	COL	0.329	61.6	8.15	0.255	0.3	32	108	118	0.92	16.6	0.069	0.31	
	11	9	DJ LeMahi	COL	0.326	46.2	6.21	0.171	0.2	91	128	103	1.24	51.6	0.097	0.81	
	12	10	Ryan Brau I	MIL	0.325	48.4	7.22	0.229	0.3	25	115	91	1.26	19.2	0.077	0.48	
	14	11	Mike Trou I	LAA	0.323	70.4	9.32	0.251	0.4	57	100	131	0.76	17.1	0.145	0.81	
	15	12	Victor Mail	DET	0.322	48.8	6.73	0.201	0.2	71	87	146	0.6	19.5	0.064	0.45	
	16	13	Eduardo NI	MIN	0.319	45.8	6.19	0.168	3 0.2	53	122	117	1.04	24.8	0.034	0.26	
	17	14	lan Desmo	TEX	0.318	60	7.33	0.203	0.3	18	115	118	0.97	22.2	0.073	0.31	
	18	15	Aledmys [!	STL	0.316	48.9	7.09	0.207	0.2	93	104	120	0.87	25.6	0.077	0.59	
	19	16	Martin Prel	MIA	0.315	40.9	5.11	0.088	3 0.1	59	141	120	1.18	147.5	0.069	0.59	
	20	17	Marcell O: I	MIA	0.314	56	7.44	0.24	0.3	21	99	126	0.79	17.9	0.076	0.38	
	21	18	Jean Segu	ARI	0.311	50.6	5.94	0.123	3 0.2	11	155	120	1.29	63.6	0.058	0.43	
	22	19	Christian 1	MIA	0.311	47.5	6.5	0.159	0.3	03	124	82	1.51	44	0.121	0.62	
	23	20	Yunel Escol	LAA	0.31	36.8	4.78	0.099	0.1	64	142	101	1.41	91.3	0.066	0.56	
	25	21	J.T. Realm	MIA	0.307	33.3	4.86	0.112	2 0.1	59	111	99	1.12	62.8	0.038	0.23	
	26	22	Robinson 5	SEA	0.306	60.5	6.98	0.241	L 0.3	15	120	154	0.78	17.1	0.071	0.49	
-	27	23	Eric Hosm I	кс	0.305	52	6.47	0.185	5 0.2	92	138	96	1.44	24.8	0.088	0.44	
	28	24	Charlie Bl	COL	0.305	49.2	7.03	0.205	5 0. 3	13	79	141	0.56	21.6	0.086	0.58	
	29	25	Francisco	CLE	0.304	50.1	5.96	0.157	0.2	84	140	123	1.14	29.9	0.083	0.65	
	30	26	Dustin Perl	BOS	0.304	47.9	5.58	0.139	0.2	59	130	137	0.95	44.1	0.096	0.75	
	31	27	Odubel Hel	PHI	0.303	52.1	6.7	0.124	L 0.:	29	111	122	0.91	36.3	0.125	0.71	
	32	28	Jonathan []	MIL	0.303	46.6	6.58	0.199	0.3	07	83	130	0.64	26.1	0.086	0.49	

2. The chart auto-scales the axes. To customize the graph, double click on the values along one of the axes to bring up a menu with options.



3. To customize the output, double click on part of the graph to bring up a menu box with options. Right click on the data points themselves to add a trend line, as shown below. In the *Format Trendline* box that appears, check the boxes *Display Equation* on chart and *Display R-squared value* on chart. (The R-squared

Name:	Date:	Class:

value, or the coefficient of determination, is a value between 0 and 1, in which, essentially, 0 indicates no relation, and 1 indicates a perfect relation.)

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C.	~	Format Data Point		9999					

Note in this example, the R^2 value is 0.0089, which tells us that in this dataset, very little correlation exists between batting average and number of ground balls. Keep in mind that finding no correlation is useful knowledge! Experiment with other columns to note differences in plots, trends and R^2 values.

- 4. Load the *Analysis ToolPak* (included with Excel) by clicking on the *Developer* tab >selecting it from *Add-Ins Available*. After loading > go to the *Data* tab > click *Data Analysis*, then:
 - Explore *Histogram, Descriptive Statistics, Correlation* and others. See the online <u>Microsoft Help</u> for more details on the use of the Analysis ToolPak.
 - Experiment with variable pairs and graph customization, taking note of shape and trend line differences
- 5. Use the remaining time to continue to search for and import data. Remember to continually save your progress!

Research and Analyze Data

Focus on the goal of the project: To find relevant variables' effect on the data and make decisions as to planning and marketing.

- Create scatter plots, trend lines, and R2 values for collected data collected. Also, find descriptive statistics via the Analysis Toolpak.
- What do you learn from the data? For example, the low correlation between ground balls and batting average may suggest that batting average is more attributed to fly balls and line drives. Or, perhaps the best hitters hit ground balls as often for outs as they do for hits. These conjectures can lead to more research and discovery; however, each conjecture by itself is weak and might not be good advice without testing the data. Be careful not confuse correlation with causation.
- Note that the results may not reinforce your opinions and expectations. Look for creative responses and solutions; conduct further research as necessary.

Create a Presentation of Analysis

Create an electronic presentation of your research. Suggested outline:

Page 1: Introduction with topic; include images, overview, why did you chose this topic?

Page 2: Related variables with explanations; why was it chosen? how did it come up?

Page 3: Graphs and relations with variables; explain patterns and/or lack of patterns, trends, inferences

Page 4: Difficulties; where would you recommend more emphasis? What was lacking? What do you wish you would have located or discovered? What goals were not supported?

Page 5: Recommendations based on research; give degree of risk of proposal, explain why you would recommend and what benefits may occur

Finish Work and Give Presentation

Complete presentations that summarize your research, graphs, interpretations and conclusions, and present to the class for assessment by the outline and rubric criteria.

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