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Data Analysis

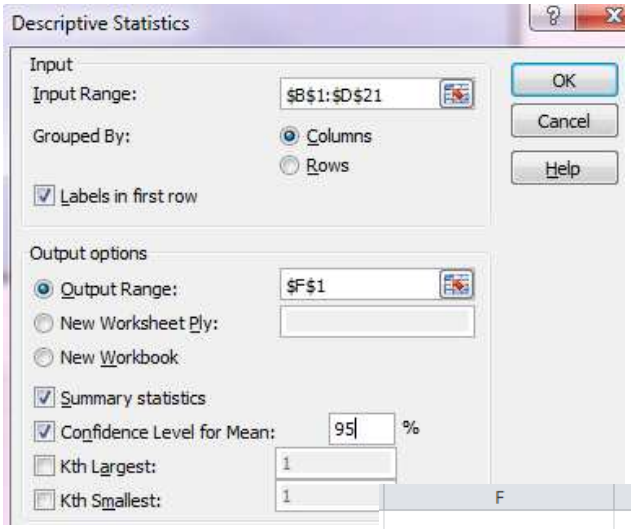
The Data Analysis Tookpak can be applied to any well organized set of data. Its tools consolidate and apply Excel's statistical functions into report formats for further interpretations and analysis.

The table at right shows how 20 sample data points are organized for use in examples throughout this document.

	A	B	C	D
1	CORN (Sept. - Aug.)	Imports (bushels)	Exports (bushels)	$ / bushel rec'd by US farmers
2	1991/92	34,447,891	1,071,277	$ 2.37
3	1992/93	22,970,116	1,695,280	$ 2.07
4	1993/94	35,940,585	1,369,954	$ 2.50

Source: USDA, National Agricultural Statistics Service, Agricultural Prices: and USDA, World Agricultural Outlook Board, World Supply and Demand Estimates. Date run: 9/13/2013

Descriptive Statistics



This tool can summarize data in place of manual Excel functions like AVERAGE(), STDEV(), and MEDIAN().

Input Range: select all desired data. Here, column A is excluded because it is just the row labels. To automatically include data labels, include the column labels and check "Labels in first row."

Output: the Output Range refers to the placement of the top left cell on the same worksheet as the data. Results can also be directed to a new worksheet or a new file.

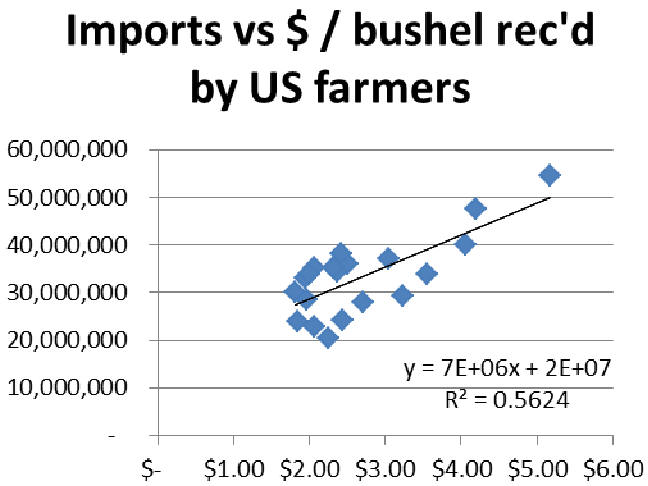
F	G	H	I	J	K
Imports (bushels)		*Exports (bushels)*		*$ / bushel rec'd by US farmers*	
Mean	33328646.49	Mean	1973870.674	Mean	2.6995
Standard Error	1836430.533	Standard Error	80006.3487	Standard Error	0.20469422
Median	33879172.18	Median	2010698.053	Median	2.395
Mode	#N/A	Mode	#N/A	Mode	#N/A
Standard Deviation	8212767.015	Standard Deviation	357799.2687	Standard Deviation	0.915420381
Sample Variance	6.74495E+13	Sample Variance	1.2802E+11	Sample Variance	0.837994474
Kurtosis	1.271599913	Kurtosis	1.139268113	Kurtosis	1.538158403
Skewness	0.807971382	Skewness	-0.783423626	Skewness	1.431181492
Range	34133958.85	Range	1526587.289	Range	3.36
Minimum	20363070.44	Minimum	1071277.274	Minimum	1.82
Maximum	54497029.29	Maximum	2597864.563	Maximum	5.18
Sum	666572929.9	Sum	39477413.47	Sum	53.99
Count	20	Count	20	Count	20
Confidence Level(95.0%)	3843693.28	Confidence Level(95.0%)	167455.2123	Confidence Level(95.0%)	0.428429926

Regression: Scatterplot

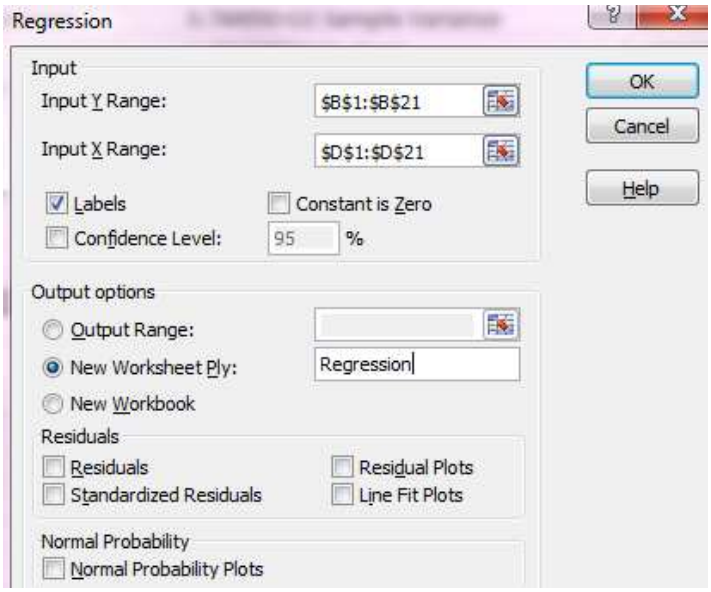
The scatterplot at right was created with Excel's basic graphing tools. It uses the "Imports" column (B) for the Y-axis data, and the "$ / bushel" column (D) for the X-axis data.

The "linear trendline," regression model (equation), and R^2 value were added via the "trendline options" dialogue accessed through this button:

Although the graph and trendline are informative, the Regression tool in Data Analysis provides further statistical details.



Regression: Data Analysis



Input Y Range: as above, this is the "Imports"

Input X Range: as above, this is the "$ / bushel"

To automatically include data labels, include the column labels from the top row and check "Labels."

The tiny screenshot below contains the results of the selections at left. The magnified inset shows how the highlighted outputs map to the regression model (equation) and R^2 generated by the scatterplot above. The additional information provided in the output, like confidence intervals and P-values, aid in model interpretation and significance testing.

	A	B
1	SUMMARY OUTPUT	
2		
3	*Regression Statistics*	
4	Multiple R	0.749948214
5	R Square	0.562422324
6	Adjusted R Square	0.538112454
7	Standard Error	5581586.109
8	Observations	20
9		
10	ANOVA	
11		*df*
12	Regression	1
13	Residual	18
14	Total	19
15		
16		*Coefficients*
17	Intercept	1.52E+07
18	$ / bushel rec'd by US farmers	6.73E+06

5	R Square	0.562422324
16		*Coefficients*
17	Intercept	1.52E+07
18	$ / bushel rec'd by US farmers	6.73E+06

$R^2 = 0.5624$

$y = 7E+06x + 2E+07$

	SS	*MS*	*F*	*Significance F*
Regression	7.20767E+14	7.20767E+14	23.13555376	0.00014032
Residual	5.60774E+14	3.11541E+13		
Total	1.28154E+15			

	Standard Error	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	3977014.295	3.813367205	0.001272902	6810418.898	23521212.87	6810418.898	23521212.87
$ / bushel rec'd by US farmers	1398814.905	4.809943218	0.00014032	3789419.202	9667021.331	3789419.202	9667021.331

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