

## Table of Contents

One-way Data Table	<a href="#">Page 2</a>
Two-way Data Table	<a href="#">Page 8</a>
Three-way Data Table	<a href="#">Page 14</a>
N-way Data Table	<a href="#">Page 20</a>

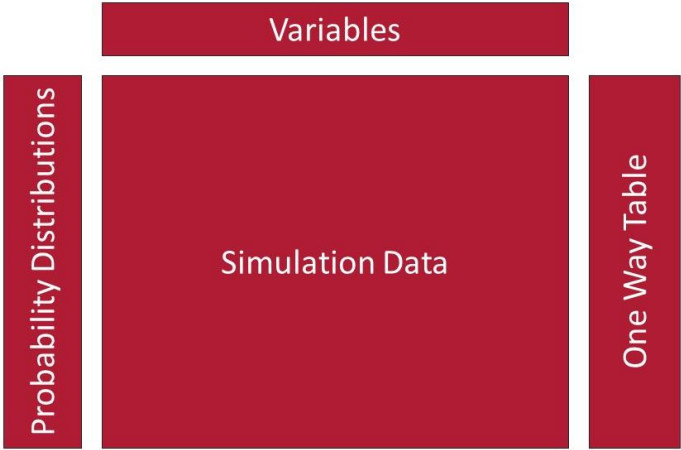
## Create a One-way Data Table

### Excel Step-by-Step How-to for PC

**Instructions:** Use this guide to create a one-way data table using Excel.

**Data requirement:** probability distribution for a scenario, simulations of the scenario (enough for stable data output)

**Sample Data:** stocking and distributing standard and luxury cars

Step	Instructions + Screen Shot
<p>1. Arrange your data so that you can reference the probability distribution and simulations.</p>	<p>At the end of this process the data should be formatted as so.</p>  <p>This example includes probability distributions for standard and luxury cars. The one-way table with</p>

represent the standard car variables effect on profit.

STANDARD	Frequency	Relative Freq.	Cumulative Prob.
10	2	0.02	0
11	1	0.01	0.02
12	6	0.06	0.03
13	3	0.03	0.09
14	6	0.06	0.12
15	3	0.03	0.18
16	7	0.07	0.21
17	7	0.07	0.28
18	6	0.06	0.35
19	14	0.14	0.41
20	6	0.06	0.55
21	9	0.09	0.61
22	10	0.1	0.7
23	13	0.13	0.8
24	7	0.07	0.93
			1

	Fleet	Upgrades						
Standard	15	5	33	12	AVG		449.92	
Luxury	10		39	14				

Replication	S- Demand	L- Demand	S-Sales	S-Surplus	S-Ups	L -sales	Profit
1	17	12	15	2	2	8	478
2	23	12	15	8	8	2	442
3	23	10	15	8	8	2	442
4	20	11	15	5	5	5	460
5	17	12	15	2	2	8	478
6	24	10	15	9	9	1	436
7	18	11	15	3	3	7	472
8	20	10	15	5	5	5	460
9	21	10	15	6	6	4	454
10	19	13	15	4	4	6	466
11	15	13	15	0	0	10	490
12	22	11	15	7	7	3	448
13	16	11	15	1	1	9	484

2. Enter the range of variables that are being evaluated in this table in a column to the right of your data.

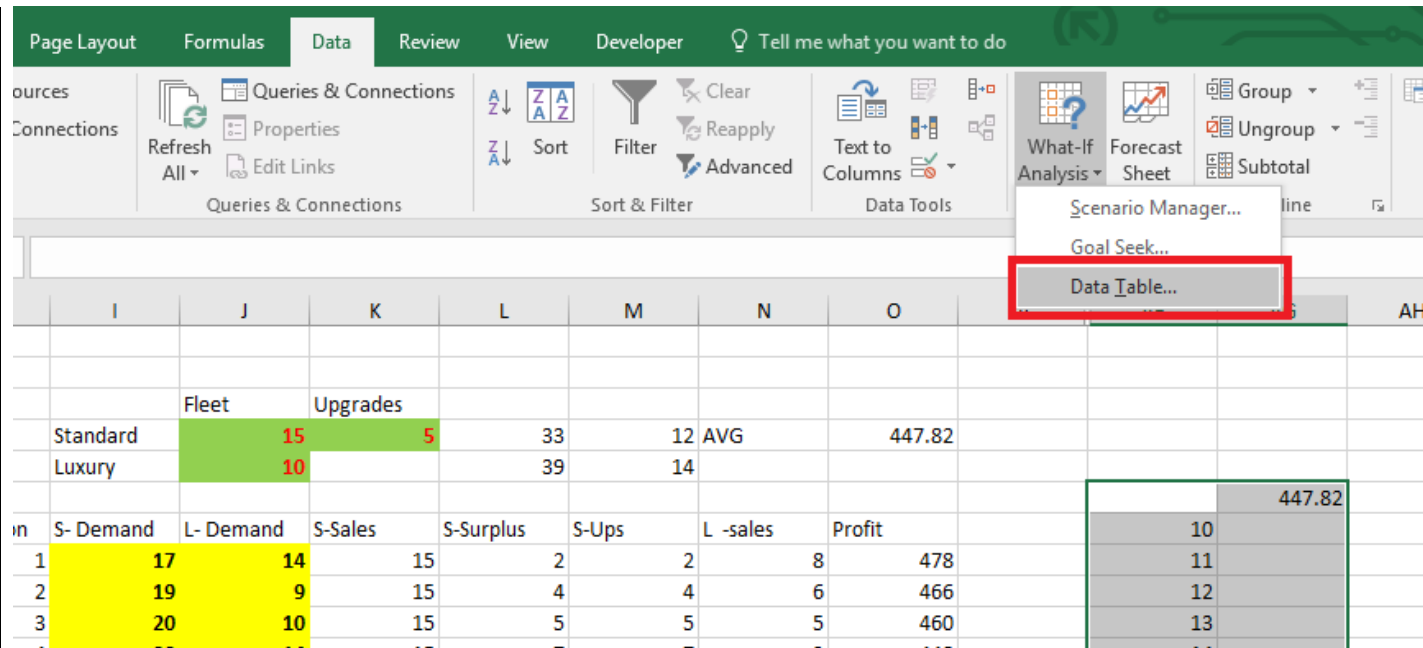
For this example the range of 10 to 24 standard cars is being evaluated. Reference the average profit above the column to the right.

	Fleet	Upgrades						
Standard	15	5	33	12	AVG		451.2521	
Luxury	10		39	14				

Replication	S- Demand	L- Demand	S-Sales	S-Surplus	S-Ups	L -sales	Profit	
1	20	11	15	5	5	5	460	10
2	13	11	13	0	0	10	430	11
3	16	12	15	1	1	9	484	12
4	13	11	13	0	0	10	430	13
5	17	12	15	2	2	8	478	14
6	17	13	15	2	2	8	478	15
7	18	10	15	3	3	7	472	16
8	12	13	12	0	0	10	400	17
9	21	12	15	6	6	4	454	18
10	17	10	15	2	2	8	478	19
11	24	9	15	9	9	1	436	20
12	19	12	15	4	4	6	466	21
13	23	13	15	8	8	2	442	22
14	19	12	15	4	4	6	466	23
15	17	11	15	2	2	8	478	24

3. Select the two columns and navigate to the data tab. Select What-If Analysis and Data Table.

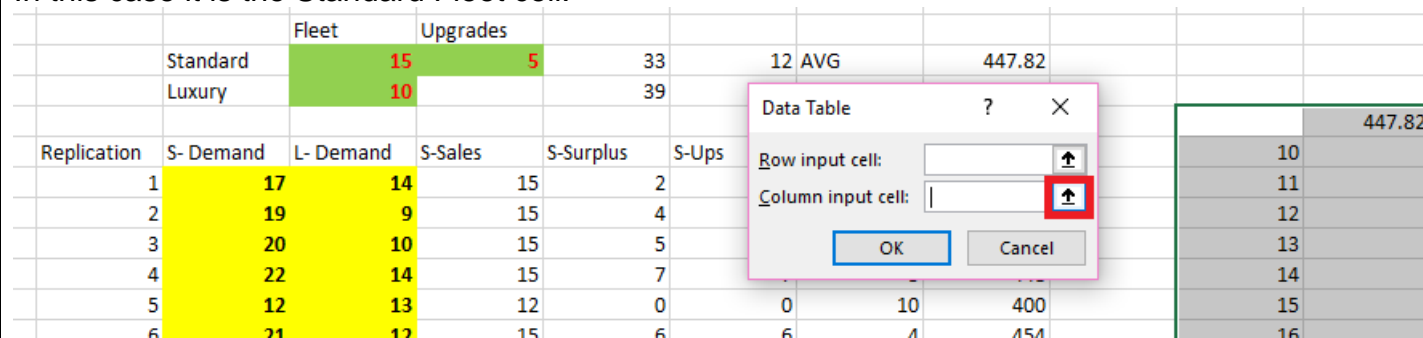


The screenshot shows the Excel ribbon with the 'Data' tab selected. The 'What-If Analysis' dropdown menu is open, and the 'Data Table...' option is highlighted with a red box. The background spreadsheet shows a table with columns for Fleet, Upgrades, and various demand and surplus values.

	Fleet	Upgrades					
Standard	15	5	33	12	AVG	447.82	
Luxury	10		39	14			

4. Populate the data table with the corresponding column data.

In this case it is the Standard Fleet cell.



The screenshot shows the 'Data Table' dialog box with the 'Row input cell' and 'Column input cell' fields both set to the cell containing the value 15 (Standard Fleet). The dialog box is highlighted with a red box. The background spreadsheet shows the same table as above, with additional rows for Replication and various demand and surplus values.

Replication	S- Demand	L- Demand	S-Sales	S-Surplus	S-Ups		
1	17	14	15	2	2	8	478
2	19	9	15	4	4	6	466
3	20	10	15	5	5	5	460

Select the desired cell.

G	H	I	J	K	L	M	N	O	P	AF	AG
			Fleet	Upgrades							
		Standard	15	5	33	12	AVG	447.82			
		Luxury	10		39						
	Replication	S- Demand	L- Demand	S-Sales	S-Surplus	S-Ups					
	1	17	14	15	2	2	8	478			
	2	19	9	15	4	4	6	466			
	3	20	10	15	5	5	5	460			
	4	22	14	15	7	7	3	448			
	5	12	13	12	0	0	10	400			
	6	21	12	15	6	6	4	454			

Click OK.

	12	AVG	447.82
S-Ups			
	0	10	400

Data Table ? X

Row input cell:

Column input cell:

OK Cancel

**TIP:** If the data table is not populating with new numbers...

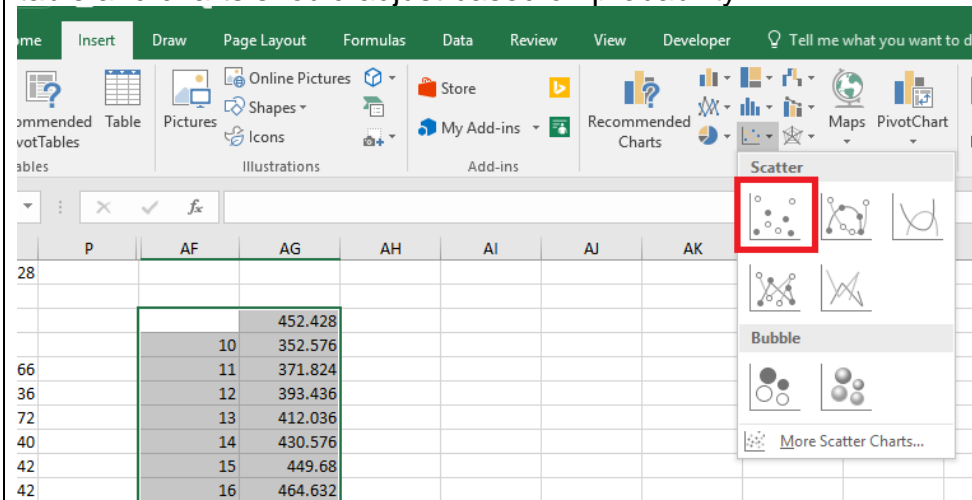


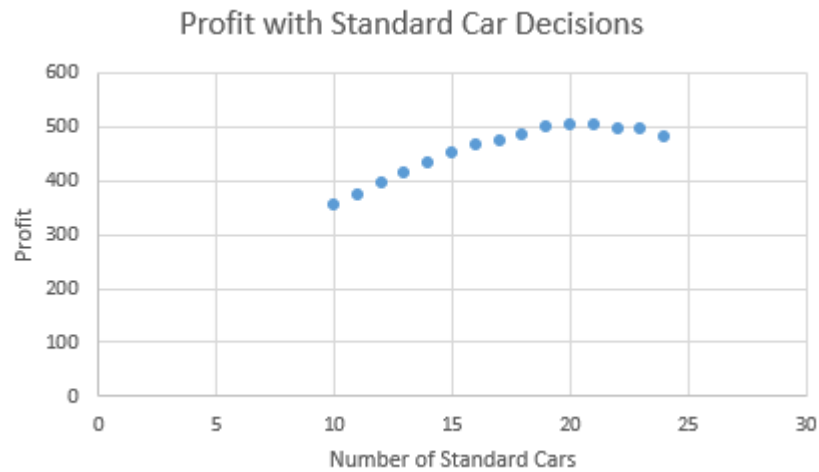
hit F9 to recalculate your data tables.

	452.428
10	352.576
11	371.824
12	393.436
13	412.036
14	430.576
15	449.68
16	464.632
17	474.46
18	486.064
19	498.46
20	504.4
21	502.528
22	497.032
23	496.312
24	482.248

5. Visualize the data table. Select the one-way table and navigate to Insert. Select Scatter chart and customize the labels.

Change the number of standard cars that will be stocked and recalculate the table. The numbers in the table and charts should adjust based on probability.





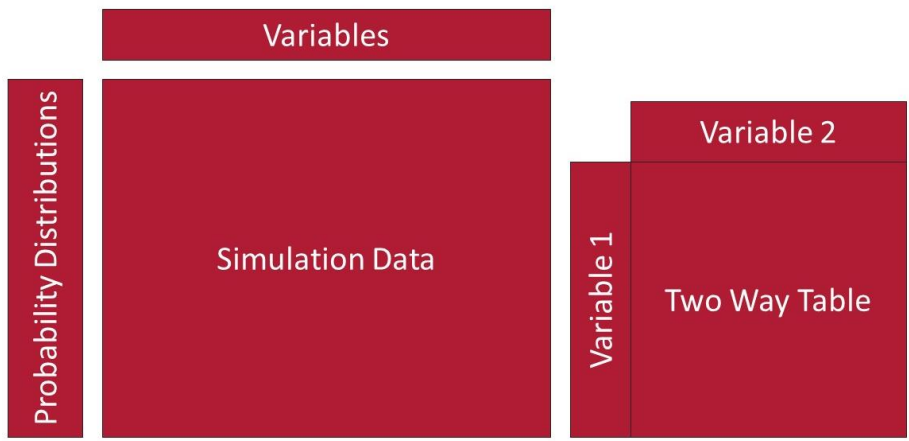
## Create a Two-Way Data Table

### Excel Step-by-Step How-to for PC

**Instructions:** Use this guide to create a two-way data table using Excel.

**Data requirement:** probability distributions for at least two scenarios, simulations of the scenario (enough for stable data output)

**Sample Data:** stocking and distributing standard and luxury cars

Step	Instructions + Screen Shot
1. See " <a href="#">Create a One-Way Data Table</a> " for initial data formatting.	<p>At the end of this process the data should be formatted as so.</p>  <p>The diagram illustrates the data structure. A large central box labeled 'Simulation Data' is flanked by 'Probability Distributions' on the left and 'Variable 1' on the right. Above 'Simulation Data' is a box labeled 'Variables'. To the right of 'Variable 1' is a box labeled 'Variable 2', which is further divided into a 'Two Way Table' section.</p> <p>For now, start with the probability distributions, simulations, and variables.</p>



[illegible]

2. To the right of the data simulations outline the two variables that are being evaluated. Put one variable in a column and one in a row, creating a matrix.

This example evaluates the stocking of standard cars in the column and the stocking of luxury cars in the row.

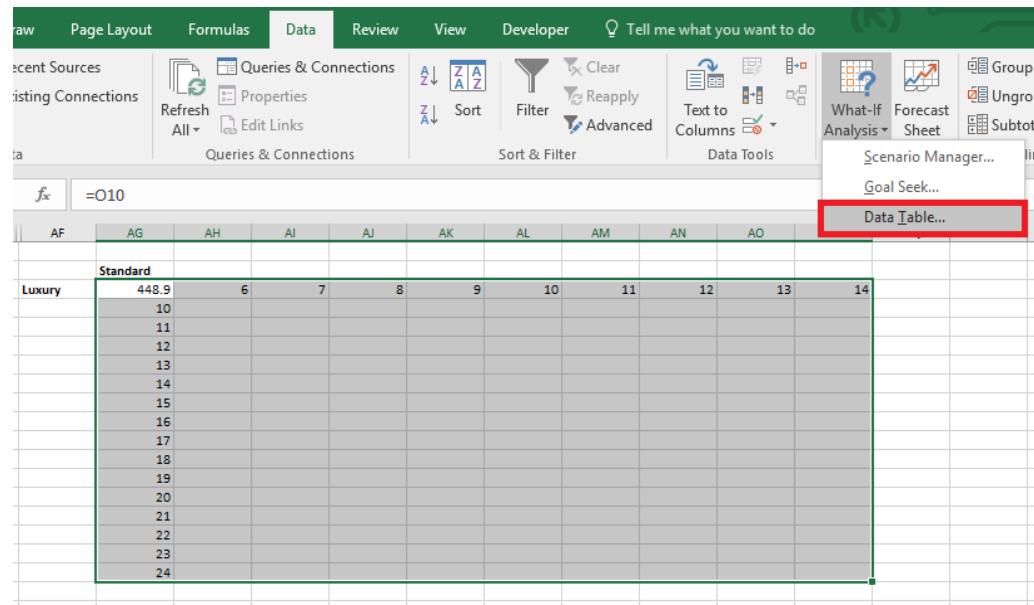
	Standard									
Luxury		6	7	8	9	10	11	12	13	14
	10									
	11									
	12									
	13									
	14									
	15									
	16									
	17									
	18									
	19									
	20									
	21									
	22									
	23									
	24									

3. Reference the dependent in the cell between the two variables.

In this example, reference the previously calculated average profit.

fx		=O10						
	M	N	O	P	AF	AG	AH	AI
3	12	AVG	448.108					
9	14							
						Standard		
					Luxury	=O10		6
	S-Ups	L-sales	Profit			10		
9	5	5	460			11		
1	1	7	412			12		
4	4	6	466			13		
4	4	6	466			14		
0	0	10	400			15		
0	0	10	490			16		

4. Highlight the entire matrix and navigate to the Data tab. Select What-If Analysis and Data Table.



The screenshot shows the Excel ribbon with the 'Data' tab selected. The 'What-If Analysis' dropdown menu is open, and the 'Data Table...' option is highlighted with a red box. The background shows a spreadsheet with a data table for 'Standard' and 'Luxury' categories, with columns for various variables and a 'Profit' column.

For this example the row input cell is the number of luxury cars to stock (J11) and the column input cell is the number of standard cars to stock (J10). Click OK.

[illegible]

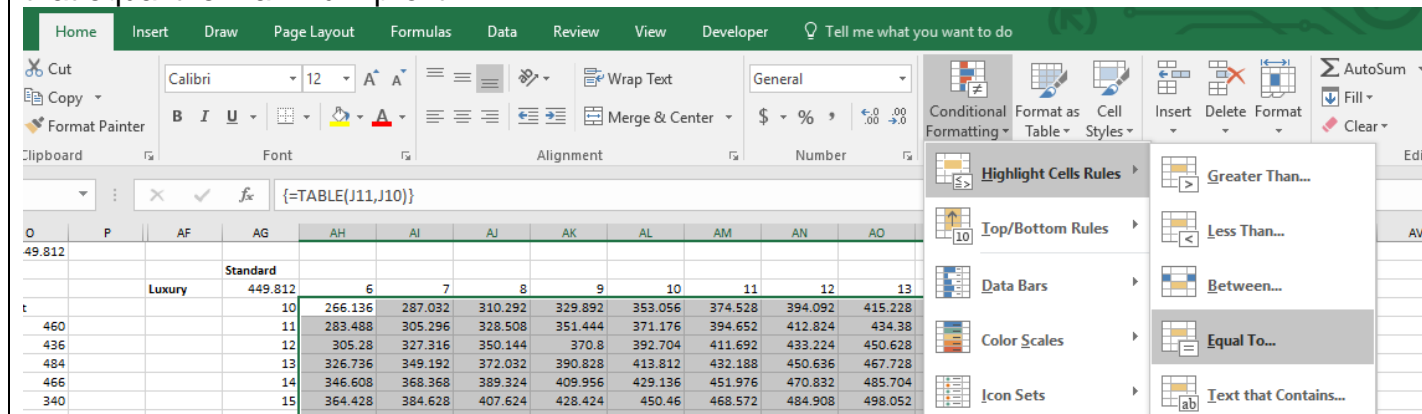
hit F9 to recalculate your data tables.

6. Identify the best outcome from the scenarios.

Identify the maximum profit using the =MAX() function.

		=MAX(AH13:AP27)									
	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP
		Standard									
	Luxury	449.812	6	7	8	9	10	11	12	13	14
		10	266.136	287.032	310.292	329.892	353.056	374.528	394.092	415.228	435.584
		11	283.488	305.296	328.508	351.444	371.176	394.652	412.824	434.38	452.192
		12	305.28	327.316	350.144	370.8	392.704	411.692	433.224	450.628	467.336
		13	326.736	349.192	372.032	390.828	413.812	432.188	450.636	467.728	481.304
		14	346.608	368.368	389.324	409.956	429.136	451.976	470.832	485.704	494.504
		15	364.428	384.628	407.624	428.424	450.46	468.572	484.908	498.052	508.052
		16	378.6	401.56	422.936	444.996	467.404	481.7	502.224	513.04	523.7
		17	394.836	418.72	434.372	458.592	479.008	495.644	507.564	521.788	528.608
		18	406.236	426.484	451.52	468.072	482.56	507.032	517.932	523.408	531.908
		19	413.1	438.832	459.536	473.532	501.736	517.424	523.74	527.644	523.592
		20	416.28	441.688	466.064	481.344	504.04	520.184	525.468	521.824	528.704
		21	417.312	446.536	461.276	481.44	508.18	518.876	515.52	527.704	509.336
		22	426.852	438.22	466.424	478.416	500.656	510.344	525.876	520.42	503.312
		23	414.312	440.92	446.852	475.764	494.2	509.624	509.64	507.784	502.52
		24	404.46	424.78	445.148	463.644	494.02	500.864	514.068	489.256	482.36
		Maximum:	531.908								

Navigate to the Home Tab and select Conditional Formatting. Set the condition to highlighting cells that equal the maximum profit.



The screenshot shows the Microsoft Excel interface with the Home tab selected. The ribbon includes options for Cut, Copy, Format Painter, Font, Alignment, Number, Conditional Formatting, Format as Table, Cell Styles, Insert, Delete, and Format. The Conditional Formatting dropdown menu is open, displaying various rules and options. The 'Equal To...' option is highlighted, indicating the selection of a condition to highlight cells that equal a specific value.

	Standard													
Luxury	446.368	6	7	8	9	10	11	12	13	14				
10		266.136	287.032	310.292	329.892	353.056	374.528	394.092	415.228	435.584				
11		283.488	305.296	328.508	351.444	371.176	394.652	412.824	434.38	452.192				
12		305.28	327.316	350.144	370.8	392.704	411.692	433.224	450.628	467.336				
13											28	481.304		
14											04	494.504		
15											52	508.052		
16											04	523.7		
17											88	528.608		
18											08	531.908		
19											44	523.592		
20											24	528.704		
21											04	509.336		
22		426.852	438.22	466.424	478.416	500.656	510.344	525.876	520.42	503.312				
23		414.312	440.92	446.852	475.764	494.2	509.624	509.64	507.784	502.52				
24		404.46	424.78	445.148	463.644	494.02	500.864	514.068	489.256	482.36				
	Maximum:	531.908												

For this example the highest profit is yielded when 14 luxury and 18 standard cars are stocked. Test that you have a stable data set by recalculating your data table. If the optimal cell is the same then you have enough simulations. If it changes then create more replications for your data set.

	Standard													
Luxury	446.368	6	7	8	9	10	11	12	13	14				
10		266.136	287.032	310.292	329.892	353.056	374.528	394.092	415.228	435.584				
11		283.488	305.296	328.508	351.444	371.176	394.652	412.824	434.38	452.192				
12		305.28	327.316	350.144	370.8	392.704	411.692	433.224	450.628	467.336				
13		326.736	349.192	372.032	390.828	413.812	432.188	450.636	467.728	481.304				
14		346.608	368.368	389.324	409.956	429.136	451.976	470.832	485.704	494.504				
15		364.428	384.628	407.624	428.424	450.46	468.572	484.908	498.052	508.052				
16		378.6	401.56	422.936	444.996	467.404	481.7	502.224	513.04	523.7				
17		394.836	418.72	434.372	458.592	479.008	495.644	507.564	521.788	528.608				
18		406.236	426.484	451.52	468.072	482.56	507.032	517.932	523.408	531.908				
19		413.1	438.832	459.536	473.532	501.736	517.424	523.74	527.644	523.592				
20		416.28	441.688	466.064	481.344	504.04	520.184	525.468	521.824	528.704				
21		417.312	446.536	461.276	481.44	508.18	518.876	515.52	527.704	509.336				
22		426.852	438.22	466.424	478.416	500.656	510.344	525.876	520.42	503.312				
23		414.312	440.92	446.852	475.764	494.2	509.624	509.64	507.784	502.52				
24		404.46	424.78	445.148	463.644	494.02	500.864	514.068	489.256	482.36				
	Maximum:	531.908												

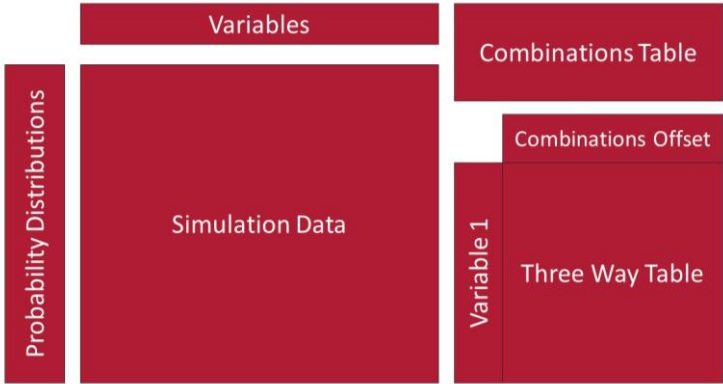
## Create a Three-Way Data Table

### Excel Step-by-Step How-to for PC

**Instructions:** Use this guide to create a three-way data table using Excel.

**Data requirement:** probability distributions for at least two scenarios, simulations of the scenario (enough for stable data output)

**Sample Data:** stocking and distributing standard and luxury cars

Step	Instructions + Screen Shot
<p>1. See <a href="#">“Create a One-Way Data Table”</a> for initial data formatting.</p>	<p>At the end of this whole process the data should be formatted as so.</p>  <p>For now, start with the probability distributions, simulations, and variables.</p>

Start by creating a table with each possible combination of two of the variables that should be evaluated. In this case, a combination of 12-13 luxury cars and 2-5 upgrades are being tested.

Luxury	12	12	12	12	13	13	13	13
Upgrades	2	3	4	5	2	3	4	5

Use the offset function to allow the data table to count through these combinations that have been laid out. Label the offset and give it a starting value of 1.

Luxury	12	12	
Upgrades	2	3	
Offset			
1			

Populate the variable decision cell (in this example, luxury fleet cell) with the offset function. The reference is the cell labeled luxury beside the combinations table, the rows is zero, and the number of columns is the number below the label "Offset".

=OFFSET(AF10,0,AF13)												
H	I	J	K	L	M	N	O	P	AF	AG	AH	
		Fleet	Upgrades									
	Standard	15	5	33	12	AVG	485.436		Luxury	12	12	
	Luxury	12		39	14				Upgrades	2	3	
									Offset			
ication	S- Demand	L- Demand	S-Sales	S-Surplus	S-Ups	L -sales	Profit		1			
1	22	11	15	7	5	7	504					
2	23	13	15	8	8	4	486					

Repeat this process with Upgrades.

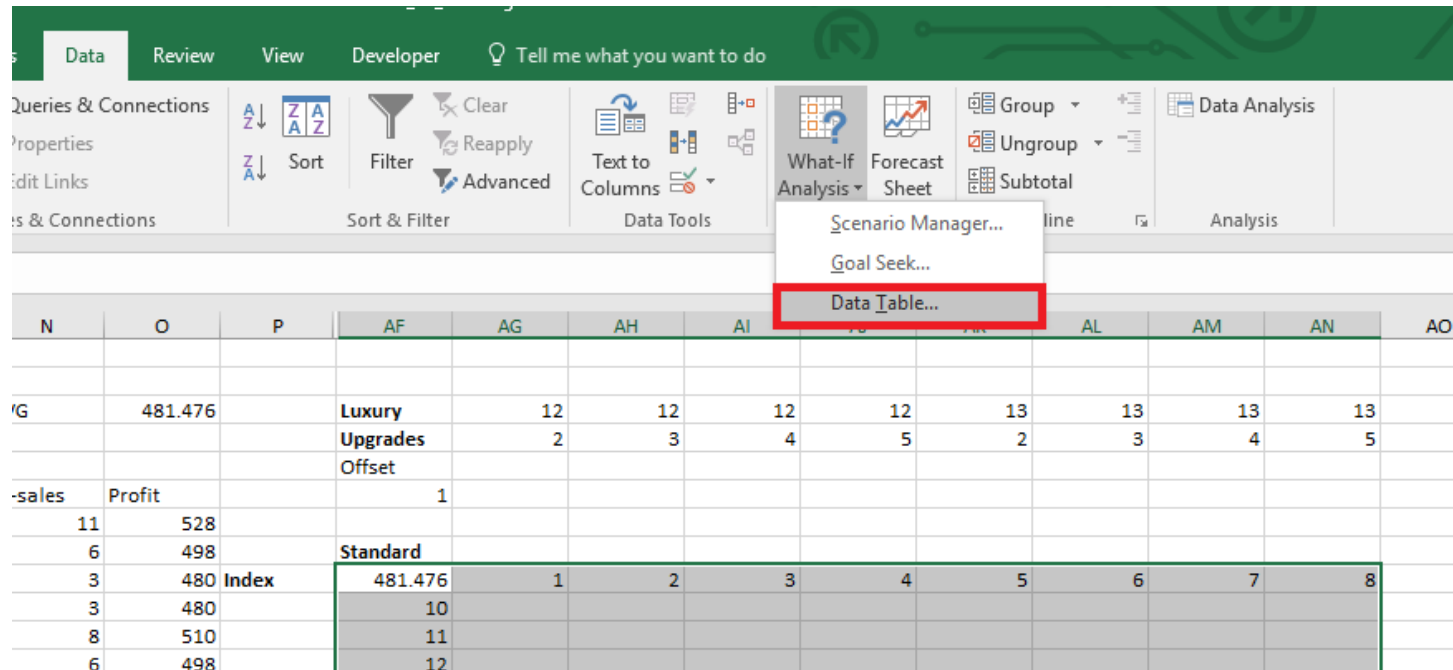
=OFFSET(AF11,0,AF13)												
I	J	K	L	M	N	O	P	AF	AG	AH		
		Fleet	Upgrades									
	Standard	15	2	33	12	AVG	487.248		Luxury	12	12	
	Luxury	12		39	14				Upgrades	2	3	
									Offset			
ation	S- Demand	L- Demand	S-Sales	S-Surplus	S-Ups	L -sales	Profit		1			
1	21	12	15	6	2	10	522					
2	22	9	15	7	7	5	492					

Create a second table below the combinations table. The table should mimic those created for two-way data tables. The column of the table holds the possibilities for the third variable. In this case that is the standard car stock. The row of the table holds an index for each column of the combinations table.



P	AF	AG	AH	AI	AJ	AK	AL	AM	AN	
	Luxury	12	12	12	12	13	13	13	13	
	Upgrades	2	3	4	5	2	3	4	5	
	Offset									
	1									
	Standard									
Index	481.476	1	2	3	4	5	6	7	8	
	10									
	11									
	12									
	13									
	14									
	15									
	16									
	17									
	18									
	19									
	20									
	21									
	22									
	23									
	24									

3. Highlight the matrix and navigate to the Data tab. Select What-If Analysis and Data Table.



N	O	P	AF	AG	AH	AI	AL	AM	AN	AO
	481.476		Luxury	12	12	12	12	13	13	13
			Upgrades	2	3	4	5	2	3	4
			Offset							
-sales	Profit		1							
11	528									
6	498		Standard							
3	480	Index	481.476	1	2	3	4	5	6	7
3	480		10							
8	510		11							
6	498		12							

4. Populate the row input cell and the column input cell with the appropriate data.

The row input cell should reference the offset counter (the cell below the label offset) and the column input cell should reference the standard fleet cell.

J10

</

**TIP:** If the data table is not populating with new numbers...



hit F9 to recalculate your data tables.

6. Identify the best outcome from the scenarios.

Use the same methods that are found in [“Create Two-Way Data Table”](#) to identify the maximum profit.

<b>Luxury</b>	12	12	12	12	13	13	13	13
<b>Upgrades</b>	2	3	4	5	2	3	4	5
<b>Offset</b>								
1								
<b>Standard</b>								
486	1	2	3	4	5	6	7	8
10	394.98	394.68	396.972	395.484	415.156	415.552	416.212	417.124
11	415.356	412.392	415.08	414.804	434.08	434.224	432.508	433.024
12	432.648	432.12	430.968	432.6	450.28	450.364	450.448	448.78
13	449.22	451.776	449.58	451.452	471.736	469.492	470.296	469.084
14	468.744	467.832	469.896	468.732	487.504	486.676	486.232	484.48
15	483.924	483.336	484.212	485.328	500.608	498.484	493.192	501.592
16	498.528	501.84	499.404	500.82	509.536	509.308	511.108	506.572
17	514.752	508.08	508.212	512.916	516.82	518.056	520.54	515.956
18	521.58	516.06	520.956	519.612	516.712	527.596	523.564	521.296
19	521.292	522.84	519.576	520.152	533.236	527.8	529.576	525.328
20	525.432	513.912	525.336	520.344	522.952	531.34	531.436	525.82
21	526.608	525.576	518.58	519.588	521.164	524.968	525.556	517.78
22	524.568	516.528	516.42	520.116	518.656	519.016	517.864	520.636
23	521.88	509.076	507.492	512.808	513.484	510.772	508.168	514.972
24	499.332	489	495.948	505.716	496.96	493.348	489.088	492.532
<b>Maximum:</b>	533.236							

For this example the highest profit is yielded when 13 luxury and 19 standard cars are stocked and 2 upgrades are available. Test that you have a stable data set by recalculating your data table. If the optimal cell is the same then you have enough simulations. If it changes then create more replications for your data set.

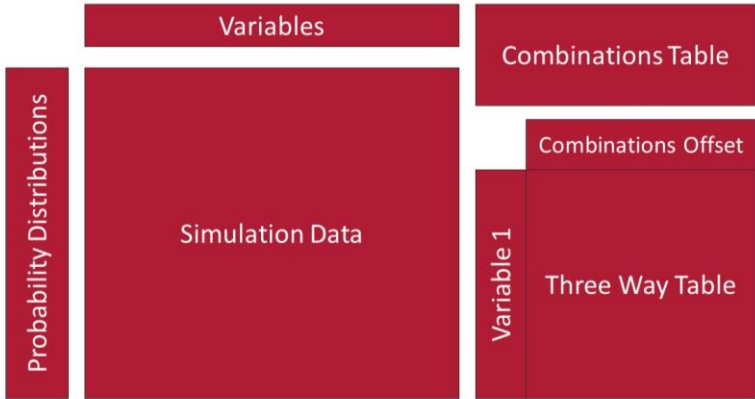
## Create an N-Way Data Table

### Excel Step-by-Step How-to for PC

**Instructions:** Use this guide to create an N-way data table using Excel.

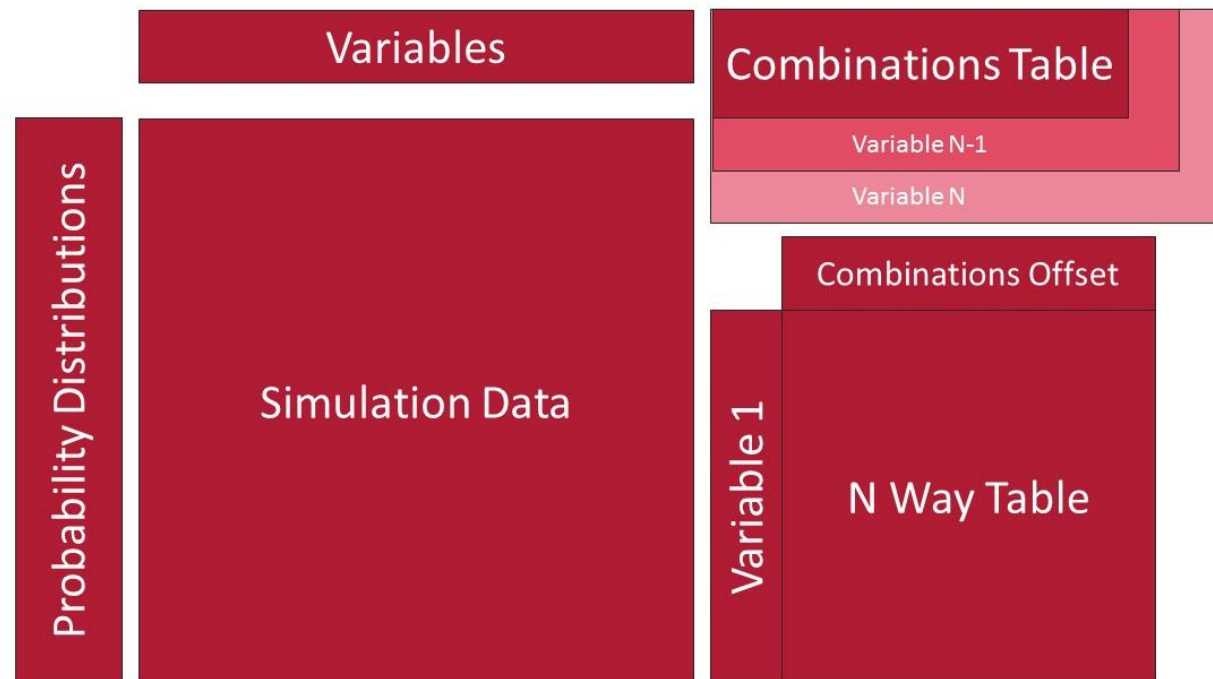
**Data requirement:** probability distributions for at least two scenarios, simulations of the scenario (enough for stable data output)

**Sample Data:** stocking and distributing standard and luxury cars

Step	Instructions + Screen Shot
<p>1. Follow the <a href="#">“Creating a Three-Way Data Table”</a> tutorial for the basis of this process.</p>	<p>The data can start by looking like this:</p> 

2. Edit the combinations table in order to factor in the desired number of variables.

For each additional variable, add a row to the combination table. Then add each possibility for that row. You will need to add to the number of columns of this table if the options for the additional variable is greater than or equal to the smallest number of options present so far in the table.



Repeat the process of setting up the offset function and the rest of the process follows that of the three-way table.