UNIVERSITY OF MARYLAND
University College

Learning Resource

Creating a Basic Pivot Table from an Excel Table

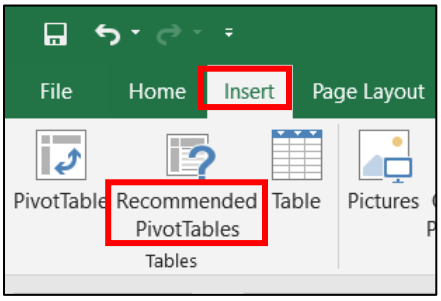
Using the Excel Table 'CarRentalTable' we created in the previous tutorial, we're going to explore the basics of pivot tables in Excel.

1. Open the Excel file 'CarRentalTable.xlsx' with the Total Row selected under Table Style Options (which means there is a Row 42 that gives a total of the Revenue Column. If there is no Row 42 in the current file, return briefly to Step 5 in the previous tutorial '02 Using Excel Tables'.

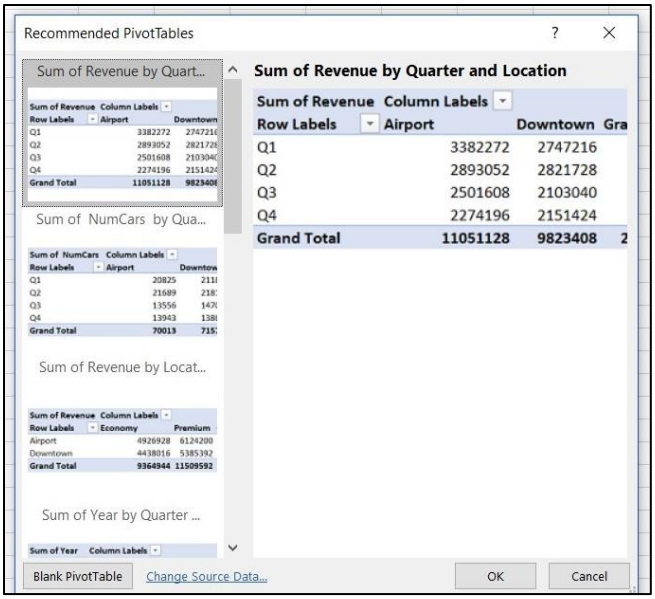
The Pivot Table functionality in Excel allows a user to organize very complex data in summary tables.

There are many ways to create a Pivot Table in Excel. Ultimately, learning how to create a Pivot Table 'from scratch' is important so that the exact Pivot Table that presents precisely the data desired, in the format desired can be created.

2. But for the purposes of this introductory tutorial, we're going to have a look at Excel's 'Recommended PivotTables' functionality. To create a Pivot Table from our Excel Table 'CarRentalTable' simply click any cell within the 'CarRentalTable', choose the Insert tab, then 'Recommended PivotTables' from the Tables group.



You'll see a dialog box with various options for how to present the data.



When running 'Recommended PivotTables' for this tutorial with the 'CarRentalTable' data, Excel offered TEN options, including:

- Sum of Revenue by Quarter and Location
- Sum of Revenue by Location and CarClass
- Sum of Revenue by Year and Quarter (both CarClass and Location are combined in the summary data)
- Average of Revenue by Location and CarClass (average is per quarter)

But be careful, not all of Excel's suggestions make sense given the nature of the data. One of the suggestions was Count of Revenue by Quarter and Location. But this Pivot Table does not provide useful information because it simply presents the number of quarters that had data, 6 for Q1 and Q2 (3 for Economy and 3 for Premium, 1 each in 2015, 2016, and 2017) and 4 for Q3 and Q4 (Q3 and Q4 were only recorded for 2015 and 2016, not 2017).

Another suggestion was 'Sum of Year by Quarter and Location', which is even more absurd because it simply added up the Years for each Quarter and Location.

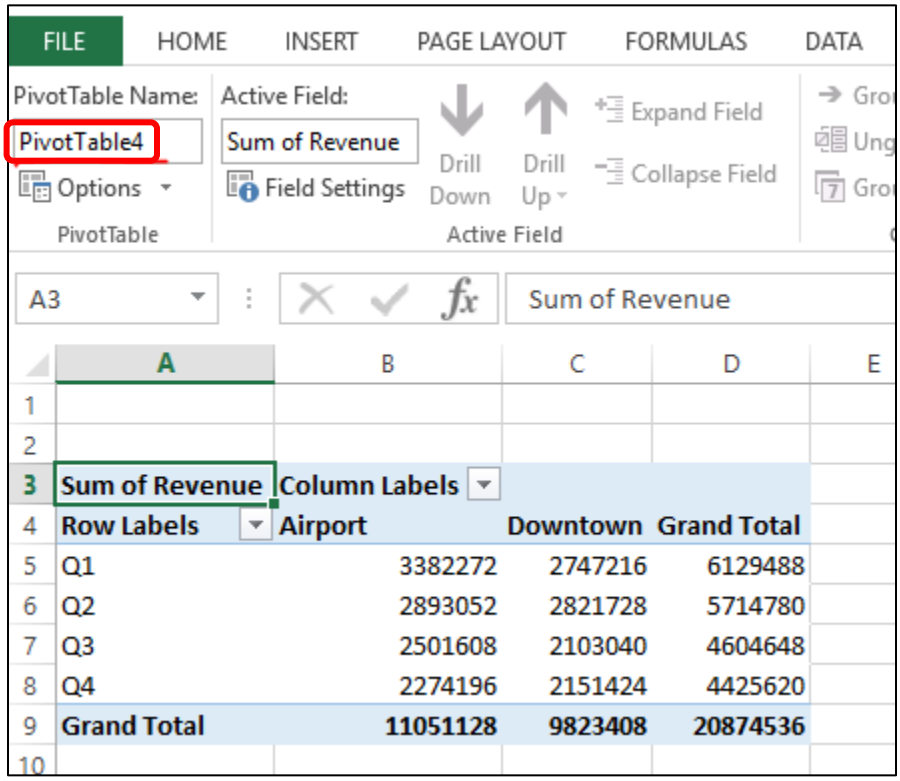
Sum of Year by Quarter and Location

Sum of Year / Row Labels	Column Labels: Airport	Downtown	Grand Total
Q1	12096	12096	24192
Q2	12096	12096	24192
Q3	8062	8062	16124
Q4	8062	8062	16124
Grand Total	**40316**	**40316**	**80632**

Thus, always remember that Excel may produce fancy tables and graphics, but it does not understand the data; this is your job as a data analyst.

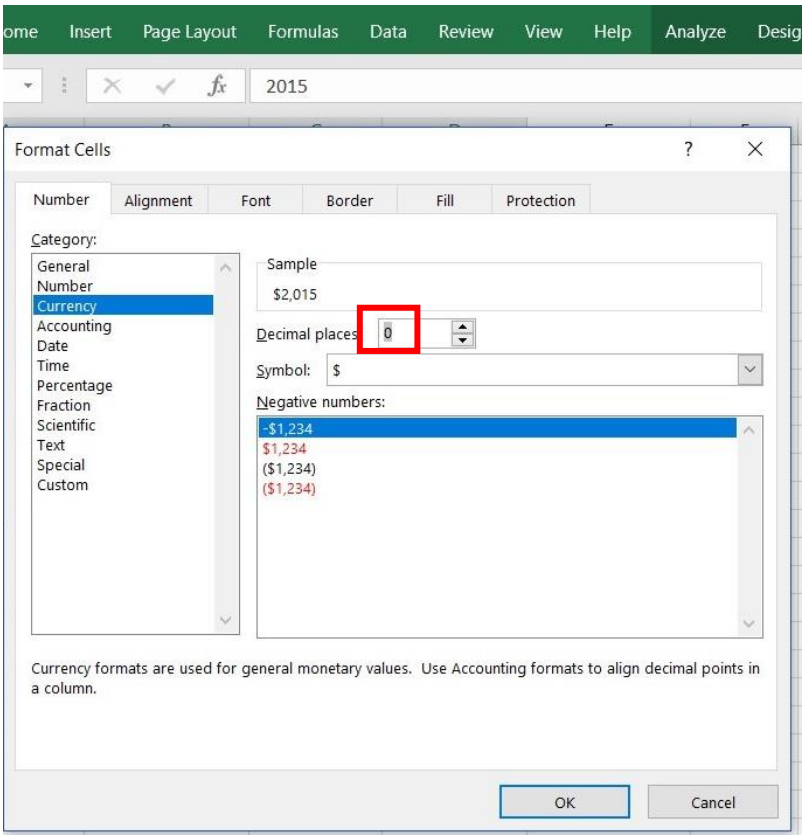
3. For the purposes of presenting a PivotTable, let's choose **Sum of Revenue by Quarter and Location** and when you click OK it should add the Pivot Table to a new Worksheet. The new Worksheet will be called Sheet3 or Sheet4 or Sheet10 depending on how many sheets you have already. Once again, I strongly suggest you rename this Sheet to something more descriptive.

   My Pivot Table comes with the default PivotTable Name 'PivotTable4'; yours may differ. As with the Excel Table name 'CarRentalTable', we can change the Pivot Table name to be able to refer to this particular PivotTable in other parts of our workbook. (HINT: you may be asked to change these names in an assignment.)

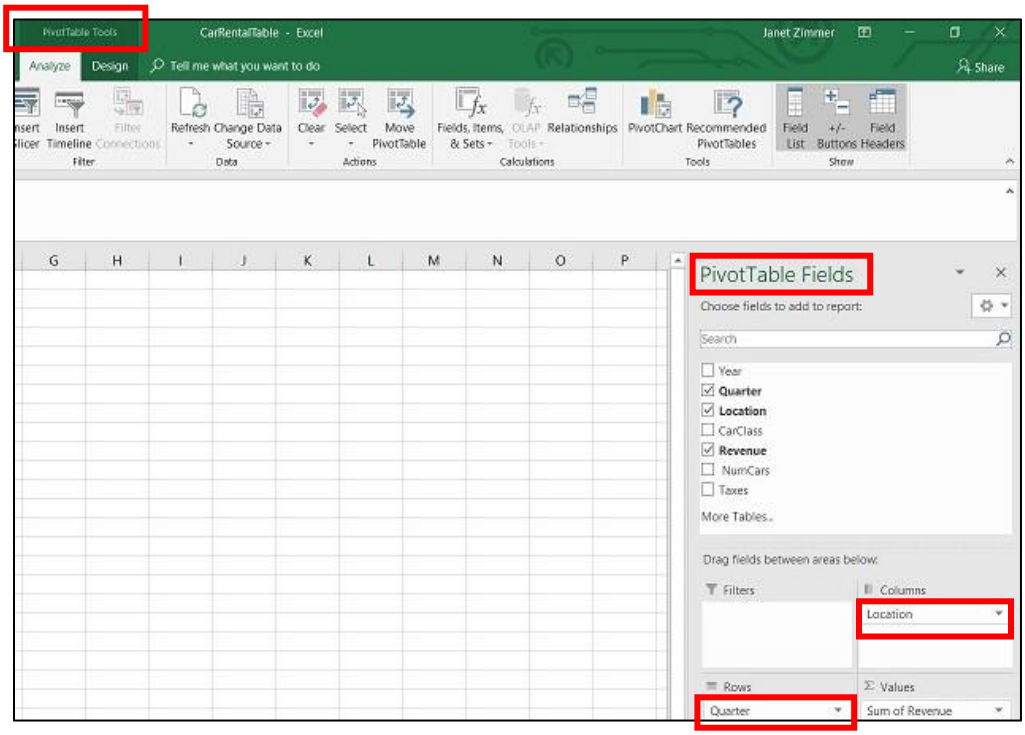


	A	B	C	D	E
1					
2					
3	**Sum of Revenue**	**Column Labels**			
4	**Row Labels**	**Airport**	**Downtown**	**Grand Total**	
5	Q1	3382272	2747216	6129488	
6	Q2	2893052	2821728	5714780	
7	Q3	2501608	2103040	4604648	
8	Q4	2274196	2151424	4425620	
9	**Grand Total**	**11051128**	**9823408**	**20874536**	
10					

4. At this point, we can begin to apply formatting to our Pivot Table, to make it more readable. For example, our Revenue is in Dollars, so we might select the Cell Range B5:D9 and from the Home Tab, under the Number group, click either the Dollar sign (for Accounting format, which aligns decimal points and the currency sign) or choose the down arrow next to General and choose 'Currency format' (which aligns the decimal point). Note: Currency format is used in your Excel projects. To ensure that you can select Currency, select the Cell Range and right click to select Number Format. Then select Currency, depending on instructions for the project, either select 2 decimal places or 0 decimal places.



5. At the top, take note that we now have a PivotTableTools tab. If you do not see a PivotTableTools tab, make sure you have selected any cell within your Pivot Table Click on Analyze under the PivotTableTools tab and have a look at the PivotTableFields area to the right. If for any reason you don't see the PivotTableFields area, in the Ribbon, under the Show group, click on 'Field List' and it will appear.

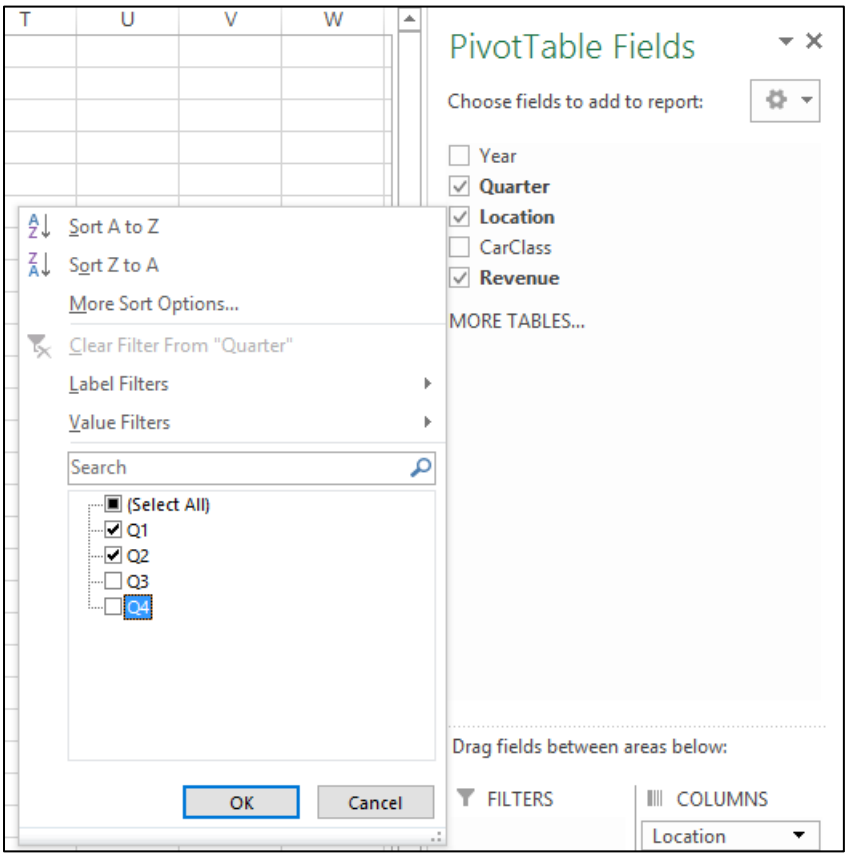


This is the 'manual' way of creating a Pivot Table from scratch or modifying a 'Recommended Pivot Table' to better fit your needs.

In the upper half of the PivotTable Fields area, you'll see the 'active' fields in our **Sum of Revenue by Quarter and Location** Pivot Table. Thus 'Quarter', 'Location' and 'Revenue' are part of our table, Year and CarClass are not.

In the lower half of the PivotTable Fields area, you'll see how those fields are used. Columns and Rows provide the structure of the Pivot Table and Values provide the data.

We can apply filters to further modify the table and our analysis. For example, we may want to know Sum of Revenue by Quarter and Location, but for Q1 and Q2 only. Clicking the down arrow next to Quarter, under PivotTableFields shows a dialog box where we can uncheck Q3 and Q4.



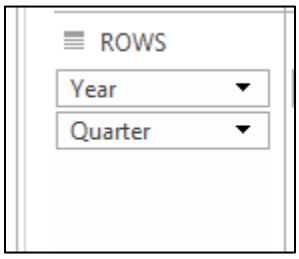
This changes the Pivot Table and the Grand Totals by location.

Sum of Revenue	Column Labels		
Row Labels	Airport	Downtown	Grand Total
Q1	$ 3,382,272	$2,747,216	$ 6,129,488
Q2	$ 2,893,052	$2,821,728	$ 5,714,780
Grand Total	**$ 6,275,324**	**$5,568,944**	**$11,844,268**

Note: the values here and below are shown in Accounting format. Be sure to follow the formatting instructions in your project.

6. In order to modify an existing Pivot Table from the PivotTableFields area, you can either click the tickbox next to the field (if it's not currently being used). Excel will then guess how you want the field to be used, which may or may not make sense. Another option is to drag the field name precisely to the area (Filter, Columns, Rows, Values) you want.

For example, if I select Year and carefully drag it just above 'Quarter' in the Rows area (you'll see a line appear just above Quarter, when you can drop it). The Rows area now looks like this:



But the Pivot Table has changed dramatically. Now I have revenues by Year and Quarter. Previously the data was simply adding up all Q1 sales, all Q2 sales, all Q3 sales and all Q4 sales, regardless of year. Our analysis might have been further skewed because Q1 and Q2 were taken from three years, while Q3 and Q4 only from two years. Yet again that interpretation and analysis of the results is the responsibility of the user, not Excel.

3	Sum of Revenue	Column Labels		
4	Row Labels	Airport	Downtown	Grand Total
5	**2015**	**$ 3,847,744**	**$ 3,624,876**	**$ 7,472,620**
6	Q1	$ 691,992	$ 694,312	$ 1,386,304
7	Q2	$ 792,320	$ 751,544	$ 1,543,864
8	Q3	$ 1,332,848	$ 976,616	$ 2,309,464
9	Q4	$ 1,030,584	$ 1,202,404	$ 2,232,988
10	**2016**	**$ 4,712,372**	**$ 4,116,528**	**$ 8,828,900**
11	Q1	$ 1,187,712	$ 967,340	$ 2,155,052
12	Q2	$ 1,112,288	$ 1,073,744	$ 2,186,032
13	Q3	$ 1,168,760	$ 1,126,424	$ 2,295,184
14	Q4	$ 1,243,612	$ 949,020	$ 2,192,632
15	**2017**	**$ 2,491,012**	**$ 2,082,004**	**$ 4,573,016**
16	Q1	$ 1,502,568	$ 1,085,564	$ 2,588,132
17	Q2	$ 988,444	$ 996,440	$ 1,984,884
18	**Grand Total**	**$ 11,051,128**	**$ 9,823,408**	**$ 20,874,536**

It's also important to mention here that the primary reason we could create Pivot Tables with only a few clicks is because we went to the trouble of carefully creating an Excel Table the previous tutorial and making sure our data was error free and suitable to continue to the next step. Data preparation can be a time consuming phase of data analysis, but time spent carefully preparing data can make the analysis phases much more streamlined.

Pivot Tables are a very powerful tool for organizing data. In the next lesson, we'll look at creating visualizations, PivotCharts, from our Pivot Tables.