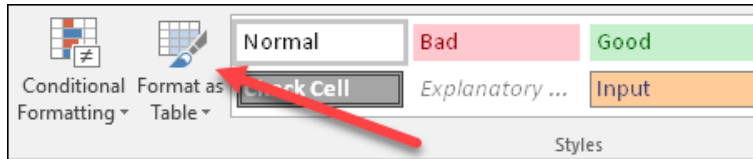


Create a Relationship to build a Pivot Table

In Excel 2013 and 2016/365 you can now create a relationship between tables of data. This is a feature that can be used to pull data from the different tables to build a PivotTable.

The first step in this process is to format the data/table with the **Format as Table** feature. This can be found on the **Home** tab, as part of the **Styles** group.



Once you have formatted the table you need to give it a name. Naming the tables will make it easier to identify and work with your data in the Pivot Table. Third, you will need to setup a relationship between each of the three tables.

In the following scenario, using hotel data (*you as the employee*), have downloaded new data into Excel from the hotel's SQL database. You have downloaded three tables that you would like to use in a pivot table. These three tables are; Customers, Reservations and Rooms tables.

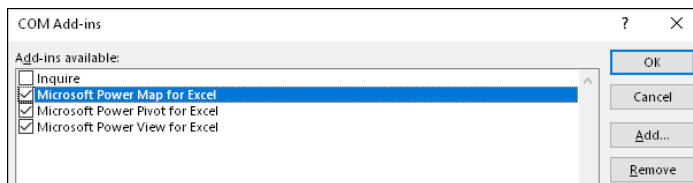
As mentioned above, to be able to build a pivot table from all three tables you will need to prepare the data first. The first step is to format each table as a table using the **Format as Table** feature. Second name each table with a unique name. Third, setup a relationship with each table using the **Relationship** feature on the **Data** ribbon.

After the above three steps are done, you will need to use of Excel's Business Intelligent the PowerPivot add-in. If it is not currently one of your tabs in Excel, you will need to activate this add-in.

(Click *File, Options, Add-ins* category. At the bottom of the dialog box click the down arrow for *Manage* and select *COM Add-ins* and click the *Go* button.



In the Add-ins available list check the box for Microsoft Power Pivot for Excel. Then click **OK**.)



Using the Power Pivot ribbon you add each table to your Data Model. After all are added, click Manage, Click Pivot Table on the Home ribbon.

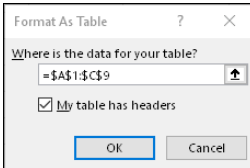
Building a pivot table using multiple tables

1. Click in the **Customers** table.
2. On the Home ribbon, click the Format as Table button and select **Blue, Table Style Medium 6**.

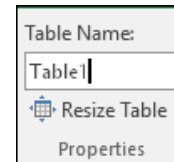


The style is in the Medium section first row.

3. In the Format As Table dialog box, confirm that **“My table has headers”** is checked.



4. Click the **OK** button.
5. On the *Design* ribbon click in the *Table Name* box, type: **Customers** and press [Enter]

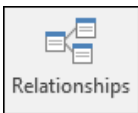


You have created your first formatted table and named the table.

1. Repeat steps 1 – 5 for the other two tables.
2. Name the tables the same as the sheet names; **Reservations** and **Rooms**.

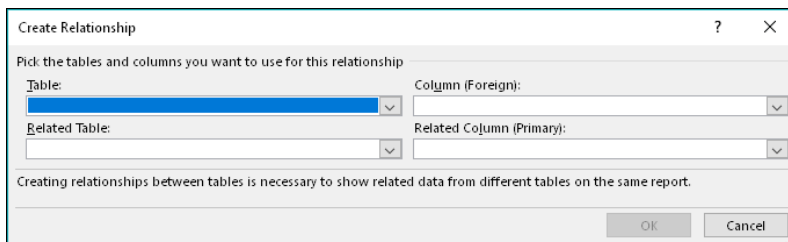
In the next few steps you will create the relationship between the three tables. If you look at each table you will notice that the Customers table has a CustID column and the Reservations table has a CustID column. This unique identifier will be used to create the first relationship. The second will be between the Reservations table which has a RoomID column and the Rooms table which has a RoomID column.

1. With the Customers worksheet selected, click the *Data* tab, in the *Data Tools* group click **Relationships** button.



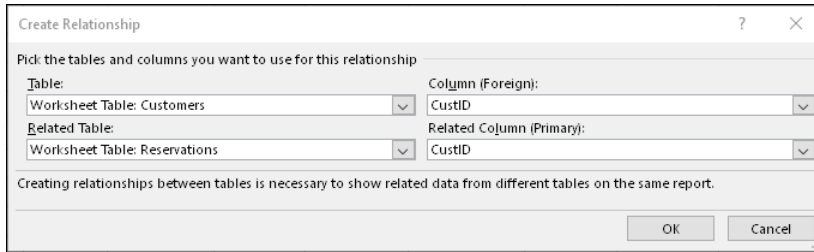
2. In the *Manage Relationships* dialog, click the **New** button.

Your screen should look like this.



3. Click the Table down arrow and select **Worksheet Table: Customers** from the list.
4. Click the Column (Foreign) down arrow and select **CustID** from the list.
5. Click the Related Table down arrow and select **Worksheet Table: Reservations** from the list.
6. Click the Related Column (Primary) down arrow and select **CustID** from the list.

Your screen should look like this.

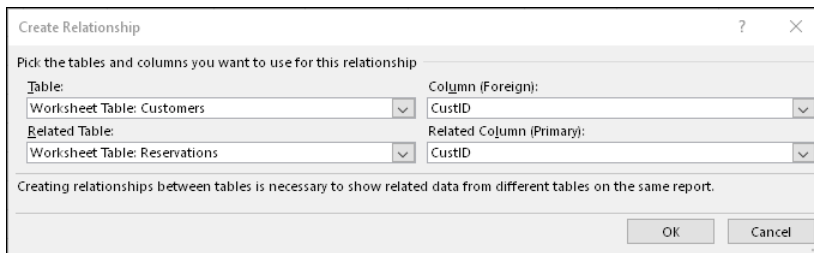


7. Click the **OK** button to complete the first relationship.

Next you will create the second relationship.

1. Click the **New...** button in the *Manage Relationships* dialog.
2. Click the *Table* down arrow and select **Data Model Table: Reservations** from the list.
3. Click the *Column (Foreign)* down arrow and select **RoomID** from the list.
4. Click the *Related Table* down arrow and select **Worksheet Table: Rooms** from the list.
5. Click the *Related Column (Primary)* down arrow and select **RoomID** from the list.

Your screen should look like this.



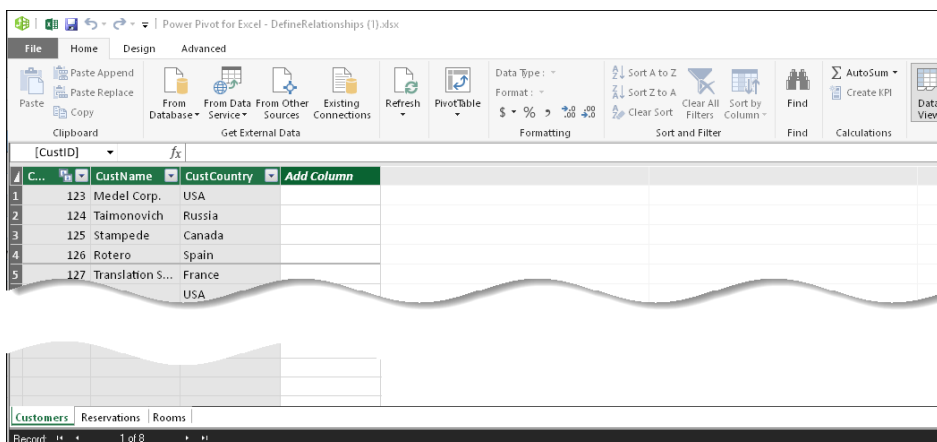
6. Click the **OK** button to complete the second relationship.

7. Click the **Close** button to exit the *Manage Relationships* dialog.

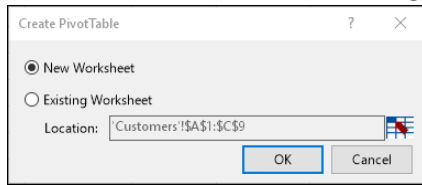
Now you are ready to view your Data Model in the Power Pivot Data Model Manager. On the **Home** ribbon of Power Pivot **Manage** feature you can create a Pivot Table.

1. Click the **Power Pivot** tab and click the **Manage** button in the *Data Model* group.

Your screen should look like this.

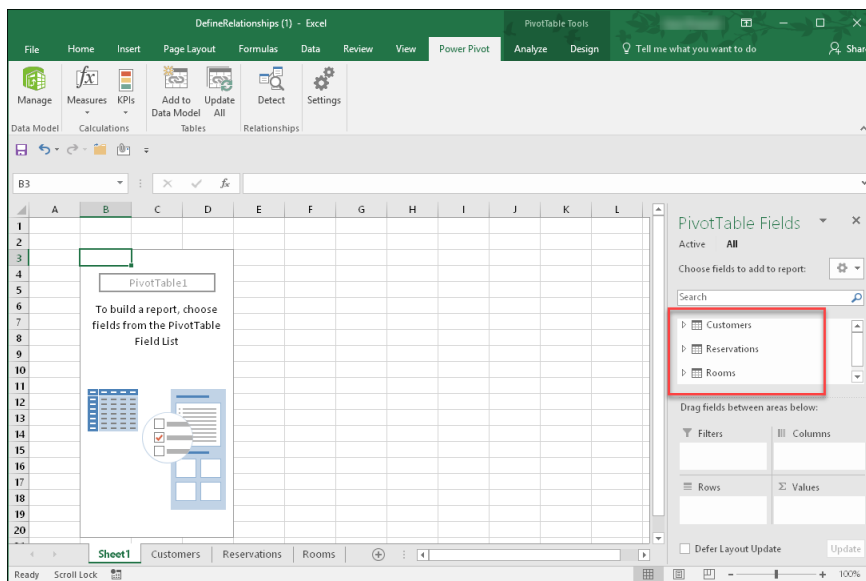


2. Click **each** of the sheet tabs at the bottom of the *Manage* window to view the data.
3. On the *Home* tab of the *Power Pivot Manage* ribbon, click the top half of the **PivotTable** button.
4. When the *Create PivotTable* dialog appears, click the **OK** button to place on a new worksheet.



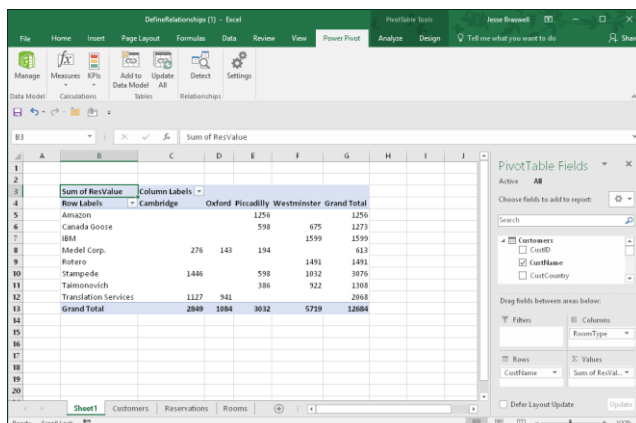
A new sheet is added to your workbook and the PivotTable structure appears. However; this PivotTable is a little different from ones you may have created before. In the PivotTable Fields pane you notice there are three items listed; Customers, Reservations and Rooms. But these are not fields these are the header for a field list.

Your screen should look like this.



1. Click the arrow head next to *Customers* to expand and drag **CustName** down to *Rows* box.
2. Click the arrow head next to *Reservations* to expand and drag **ResValue** down to *Values* box.
3. Click the arrow head next to *Rooms* to expand and drag **RoomType** down to *Columns* box.

Your screen should look like this.



You have created a PivotTable from 3 different sheets of data, using a relationship to connect all three together which creates a Data Model.

What is DAX

DAX stands for Data Analyze Expression and is used in Excel to write formulas using words rather than cell addresses. Primarily it is used when working in PowerPivot but can be used with a formatted table.

Data Analysis Expressions (DAX) sounds a little intimidating at first, but don't let the name fool you. DAX basics are really quite easy to understand. First things first - DAX is NOT a programming language. DAX is a formula language. You can use DAX to define custom calculations for Calculated Columns and for Measures (*also known as calculated fields*). DAX includes some of the functions used in Excel formulas, and additional functions designed to work with relational data and perform dynamic aggregation. The following is a simple example.

1. Click the **Employee List** worksheet tab.
2. The current table, **Format as Table** and name table **Payroll**.
3. Click in cell **L4** and type the following: **=SUM(P**

J	K	L	M	N
GrossPay		GrossPay Grand Total:		
\$ 600.00		=SUM(P		
\$ 712.00		SUM(number1, [number2], ...)		
\$ 882.00		Payroll		
\$ 960.00		PERCENTILE		
\$ 828.00		PEARSON		
		PERCENTILE.EXC		

4. Double click **Payroll** in the *drop down list*.
5. Type an *open square bracket*: **[**

J	K	L	M	N
GrossPay		GrossPay Grand Total:		
\$ 600.00		=SUM(Payroll[
\$ 712.00				
\$ 882.00		EmpID		
\$ 960.00		FirstName		
\$ 828.00		LastName		
\$ 680.00		DateHired		
\$ 740.00		Dept Code		
\$ 920.00		DeptName		
\$ 560.00		Division		
\$ 491.20		Hours		
\$ 880.00		PayRate		
		GrossPay		
		#All		

6. Double click the **GrossPay** field in the *drop down list*.
7. Add a close *square bracket* **]** and close *parenthesis* **)**.
8. Press **[Enter]** to complete your DAX formula.

Your screen should look like this.

=SUM(Payroll[GrossPay])									
C	D	E	F	G	H	I	J	K	L
EmpID	DateHired	Dept Code	DeptName	Division	Hours	PayRate	GrossPay		GrossPay Grand Total:
1	7/22/2004	TR	Training Region	Yakima	40	\$15.00	\$ 600.00		147667
2	7/22/2004	BF	Backup Floor	Bremerton	32	\$22.25	\$ 712.00		
3	7/22/2004	NB	North Bank	Wenatchee	42	\$21.00	\$ 882.00		
4	4/23/2005	PP	Pepper Park	Anacortes	40	\$24.00	\$ 960.00		
5	4/23/2005	DR	Docking Range	Hoquiam	36	\$23.00	\$ 828.00		
6	7/22/2005	TR	Training Region	Sedro Woolle	40	\$17.00	\$ 680.00		