

Excel 2003: Pivot Tables

A pivot table is a good way to summarize large amounts of data. The information can be looked at in ways that are easier than in a worksheet. The information can also be manipulated separately from the large worksheet.

Before creating a pivot table from data, make sure that the spreadsheet data is organized in an understandable way.

1. The first row of the spreadsheet should contain column headings.
2. All column headings should be unique.
3. There should be no completely empty rows or columns or any separation of relevant data.
4. There should be no subtotals or grand totals. If there are, take them off using Data>Subtotals>Remove All>OK.
5. Each column should contain only one type of data. There should be no cells containing both text and computational numbers.

Creating a Pivot Table

Once the data is ready, select any cell in the area that you want to use in the pivot table.

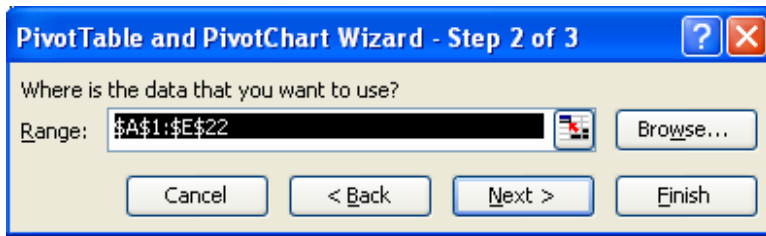
Use Data>Pivot Table and Pivot Chart Report.

The wizard will show up.

In Step 1, choose if the data is other than in Excel. You can also choose if you want a PivotChart report.

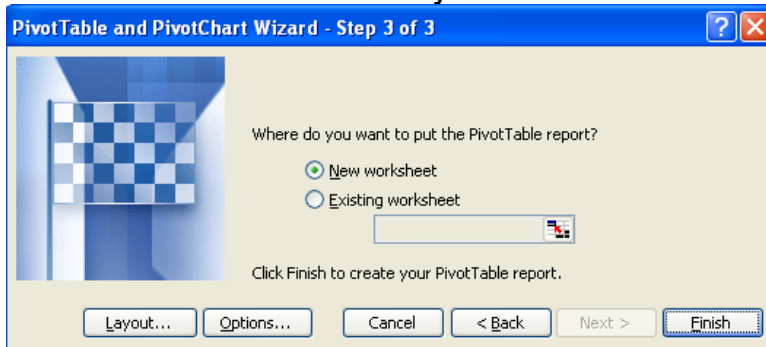


Click Next. Step 2 will choose the data range.



Click Next if Excel has guessed correctly. Otherwise, modify the range.

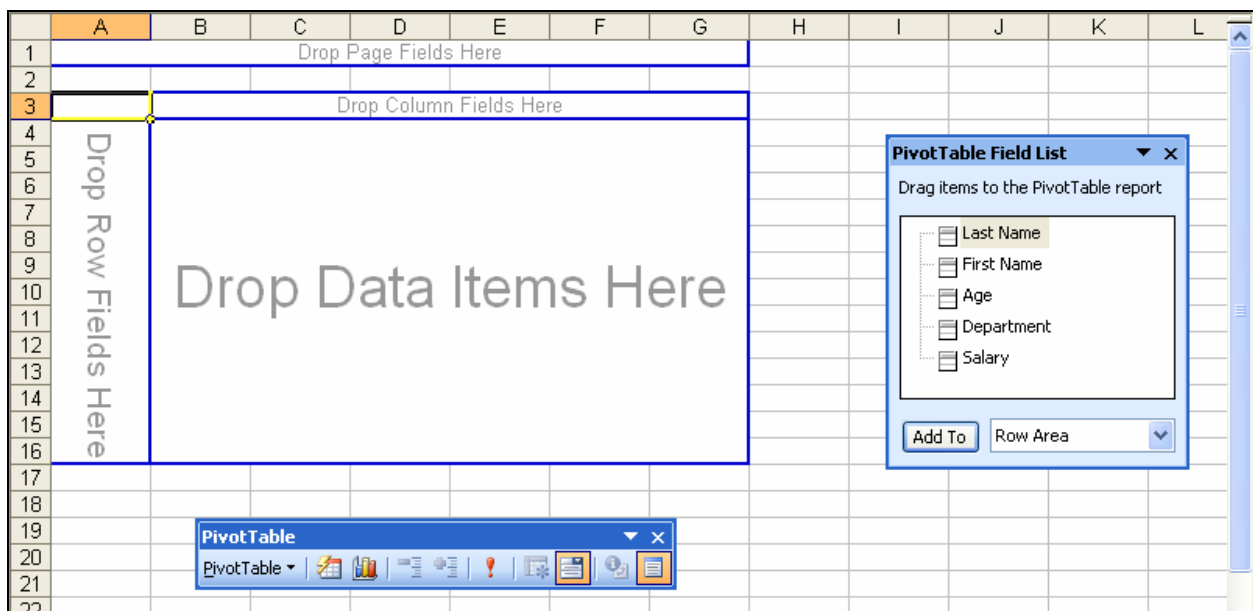
In Step 3, you can choose to have the pivot table on a new worksheet or on a worksheet that is already there.




You could create the layout and choose options at this point, but it is easier to do it on the worksheet with the field list and toolbar. Click Finish.

If you would usually want these choices, you can use Data>Pivot Table and Pivot Chart Report and then click on Finish.

A new worksheet is created with the pivot table structure. There is a PivotTable Field List and a Pivot Table toolbar.



The column headings have become fields. If the PivotTable Field List is not showing, click somewhere in the pivot table structure or click on the “Show

Field List button. 

The PivotTable toolbar helps you improve the data analysis. If the PivotTable toolbar is not showing, click in the pivot table or click on View>Toolbars>PivotTable.

Parts of a Pivot Table

The Row Fields show summaries vertically in rows.

The Column Fields show summaries horizontally across columns.

The Data Items show summaries of numerical data.

The Page Fields show summaries for a single item or all items at once.

Fields that are dropped or added to one location can easily be moved to another location, depending on the analysis wanted. When fields are added to the pivot table, the field names are formatted bold in the Field List.

Using the Row or Column Field

Here is an example of salary totals by department. Salary was added to Data Items. Department was added to Row Fields or Column Fields.

	A	B	C	D	E	F
1	Drop Page Fields Here					
2						
3	Sum of Salary					
4	Department	Total				
5	Administration	136000				
6	Development	250000				
7	Production	139000				
8	Sales	185000				
9	Grand Total	710000				
10						
11						
12						
13						
14						
15	PivotTable					
16	PivotTable					
17						
18						

Drop Page Fields Here						
Sum of Salary	Department					
	Administration	Development	Production	Sales	Grand Total	
Total	136000	250000	139000	185000	710000	

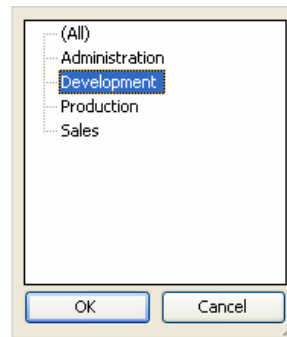
To remove the field from an area, drag it away from the pivot table area. You will see a red X when you are removing the field.

Using the Page Field and Showing All or Some Data

Here is an example of Age as the Row Field, Salary as the Data Item, and Department as the Page Field. First there is the total for all departments and then for just the Development department.

Clicking on the dropdown arrow next to (All) shows a box. Choose the request “page” view and click OK. The summaries change accordingly.

Department	(All)
Sum of Salary	
Age	Total
22	19000
25	22000
28	66000
29	94000
31	29000
33	47000
35	62000
36	30000
41	40000
42	45000
49	24000
50	62000
51	50000
55	24000
56	41000
62	55000
Grand Total	710000



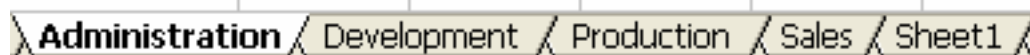
Department	Development
Sum of Salary	
Age	Total
28	41000
29	49000
31	29000
42	45000
49	24000
50	62000
Grand Total	250000

You can also choose to have the different page fields show data, each having its own worksheet.

Click on the Page field, Department in this example.

Click on the Pivot Table toolbar>Show Pages. Click OK.

The separate worksheets are immediately created in front of the pivot table worksheet. Each worksheet is actually a fully functioning pivot table that has been modified to show a specific page with information ready for reporting or printing.

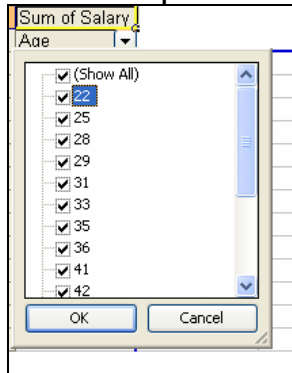


Using Both Row and Column Field and Showing Partial Data

Here is an example of cross-tabulation, using Age as a Row field and Department as a Column field. There are totals at the end of each row and column as well as the Grand Total.

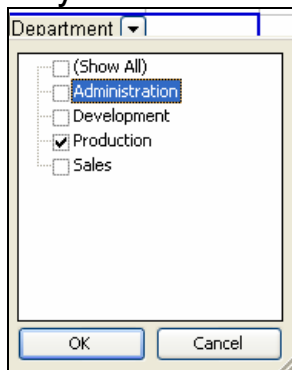
Drop Page Fields Here					
Sum of Salary	Department				
Age	Administration	Development	Production	Sales	Grand Total
22	19000				19000
25	22000				22000
28		41000		25000	66000
29	45000	49000			94000
31		29000			29000
33			28000	19000	47000
35				62000	62000
36			30000		30000
41			40000		40000
42		45000			45000
49		24000			24000
50		62000			62000
51	50000				50000
55				24000	24000
56			41000		41000
62				55000	55000
Grand Total	136000	250000	139000	185000	710000

In the Row field, you can choose which categories to show. The default is to show all. To only show some, click in the Show All box to clear all the boxes. Choose which ones you want to show and click OK. For example, if you wanted only data for those whose age was in the 30's. Notice that the Administration department is missing because there is no one in their 30's in that department. In addition, the grand total changes accordingly.



Sum of Salary	Department	Production	Sales	Grand Total
31	29000			29000
33		28000	19000	47000
35			62000	62000
36		30000		30000
Grand Total	29000	58000	81000	168000

In the Column field, you can choose which categories to show. The default is to show all. To only show some, click in the Show All box to clear all the boxes. Choose which ones you want to show and click OK. For example, if you wanted only data for those in the Production department. Notice that only the relevant ages are showing. In addition, the grand total changes.



Sum of Salary	Department	Grand Total
33	28000	28000
36	30000	30000
41	40000	40000
56	41000	41000
Grand Total	139000	139000

Updating Information

Sometimes information in the worksheet will change. Records will be revised or deleted. If information in the original worksheet changes, the pivot table will not automatically update the analysis.

Click anywhere on the report.
Use Pivot Table toolbar>Refresh Data.

Adding another record at the bottom of the worksheet will not automatically show up on the pivot table. However, adding a record to the middle of the worksheet will show up.

Changing the Sorting Order and Showing Top or Bottom Values

The data can be sorted in ascending or descending order. Also just the top or bottom specific number of values can be shown.

Click on the field heading or a cell in the list.

Click on the Pivot Table toolbar>Pivot Table.

Click on Sort and Top 10.

To change the sorting order, choose Ascending or Descending and click OK.

To show only some of the values, click On, choose between Top or Bottom, and choose the maximum number of values that will show.

This example shows the bottom four salaries with the ages ascending.

When the field is filtered by top or bottom, the heading font turns blue.

When the filtering is off, the heading font returns to its original color.

The screenshot shows a PivotTable with 'Sum of Salary' as the summary function and 'Department' as the filter. The 'Age' field is selected for sorting. The PivotTable data is as follows:

Age	Administration	Development	Production	Sales	Grand Total
22	19000				19000
25	22000				22000
49		24000			24000
55				24000	24000
Grand Total	41000	24000		24000	89000

The 'PivotTable Sort and Top 10' dialog box is open, showing the following settings:

- Field: Age
- AutoSort options: Ascending, Descending, Data source order
- Manual (you can drag items to rearrange them):
- Top 10 AutoShow: On, Off
- Show: Bottom (dropdown), 4 (spinners)
- Using field: Age (dropdown)
- Using field: Sum of Salary (dropdown)
- Buttons: OK, Cancel

Changing the Summary Function of Data

Although the sum of the values is the default, there are other automatic functions. They are Count (which counts the number of data values, same as COUNTA in the worksheet), Count Nums (which counts the number of data values that are numeric, same as COUNT in the worksheet), Average, Max, Min, Product, StDev, St Devp, Var, and Varp.

To change the summary function, click on the data area.

Click on the Pivot Table toolbar>Field Settings.

Choose another function in the Summarize by: box and click OK. Notice the label now says "Count of Salary" and that the data fields are counts.

	A	B	C	D	E	F
1						
2						
3	Count of Salary	Department				total
4	Age	Administration	Develo			1
5	22		1			1
6	25		1			2
7	28					3
8	29	1				1
9	31					2
10	33					2
11	35					1
12	36					1
13	41					1
14	42		1			1
15	49		1			1
16	50		1			1
17	51	1				1
18	55				1	1
19	56			1		1
20	62				1	1
21	Grand Total	4	7	4	6	21

Formatting Numbers in the Data Area

The numbers in the data area can be formatted at any time.

Click anywhere in the data area.

Use Pivot Table toolbar>Field Settings.

Click on the Number button.

Make choices about number types and how many decimal places.

Click OK and then OK to change the number format.

Renaming and Formatting Field Headings

The boxes that identify the field names can be relabeled.

Click the field name box.

Clear out the old name and type in a different name.

Press Enter on the keyboard or click in another cell.

The field name can be formatted in different font, font size, font color, bold, italic, and underlined. The field name cell can have different alignment and fill color. However, it is a good idea to wait until the end to make formatting changes. Click the field name box.

Click on the formatting toolbar to change the field name box.

Formatting the Report

It is better to wait until the end before formatting the report.

Click anywhere on the report.

Use Pivot Table toolbar>Format Report.

Choose an AutoFormatting design. Click OK.

To change the format design, click anywhere on the report.

Go back to Format Report. Choose another design. Click OK.

To go back to the original pivot table formatting, choose PivotTable Classic.

Printing the Report

The report can be printed at any stage of the analysis. The dropdown arrows do not show when the report is printed.

Using Outer and Inner Row Fields

More than one field can be dragged into a drop area of a pivot table. Fields can be used more than once, even in the same drop area.

If a pivot table has more than one row field, it has an inner and outer row. A pivot table can only have one inner row, the one closest to the data. However, it can have more than one outer row.

Drop Page Fields Here		
Sum of Salary		
Department	Age	Total
Administration	22	19000
	25	22000
	29	45000
	51	50000
Administration Count		4
Administration Max		50000
Development	28	41000
	29	49000
	31	29000
	42	45000
	49	24000
Development Count		7
Development Max		62000
Production	33	28000
	36	30000

Here the Department field was added to the left of the Age field. Notice that subtotals have been added.

To remove Subtotals, use Pivot Table toolbar>Pivot table. Click on Subtotals to take them off.

Sum of Salary		
Department	Age	Total
Administration	22	19000
	25	22000
	29	45000
	51	50000
Development	28	41000
	29	49000
	31	29000
	42	45000
	49	24000
Production	33	28000
	36	30000
	41	40000
	56	41000
Sales	28	25000
	33	19000
	35	62000

Grouping and Ungrouping Data

Less detailed summaries can be shown. Information can be grouped. Click anywhere in the data that needs to be grouped. Use Pivot Tables toolbar>Group and Show Detail>Group. Choose how to group information. Click OK.

To ungroup data, use Pivot Tables toolbar>Group and Show Detail>Ungroup. The information is ungrouped.

Sum of Salary		
Department	Age	Total
Administration	22-31	86000
	42-51	50000
Development	22-31	119000
	42-51	131000
Production	32-41	98000
	52-62	41000
Sales	22-31	25000
	32-41	81000
	52-62	79000
Grand Total		710000

Grouping

Auto

Starting at:

Ending at:

By:

OK Cancel

Hiding and Showing Detail

To decrease the amount of information showing, details can be hidden.

Click anywhere in the field that needs to be hidden. For example, if several departments need to have hidden data, select them all. Use Pivot Tables toolbar>Group and Show Detail>Hide Detail.

Sum of Salary		
Department	Age	Total
Administration		136000
Development		250000
Production		139000
Sales		185000
Grand Total		710000

To get the information back, select all the relevant headings and use Pivot Tables toolbar>Group and Show Detail>Show Detail.

Using Custom Calculations

There are custom calculations included in the pivot table. They are Difference, % Of, % Difference From, Running Total in, % Of Row,% Of Column, % Of Total, and Index.

To use an included calculation, use Pivot Tables toolbar>Field Settings. Click on the Option button.

Choose a calculation in the Show data as: and click OK.

The screenshot shows a PivotTable with the following data:

Sum of Salary		
Department	Age	Total
Administration	22	2.68%
	25	3.10%
	29	6.34%
	51	7.04%
Development	28	5.77%
	29	6.90%
	31	4.08%
	42	6.34%
	49	3.38%
	50	8.73%
Production	33	3.94%
	36	4.23%
	41	5.63%
	56	5.77%
Sales	28	3.52%
	33	2.68%
	35	8.73%
	55	3.38%

Overlaid on the table is the 'PivotTable Field' dialog box. The 'Source field' is 'Salary'. The 'Name' is 'Sum of Salary'. Under 'Summarize by:', 'Sum' is selected. Under 'Show data as:', '% of total' is selected. The 'Base field' is 'Last Name' and the 'Base item' is empty.

GETPIVOTDATA Function

If an equal sign is typed in a cell outside the pivot table and a cell inside the pivot table is selected, the GETPIVOTDATA function is activated. This will get the information from the cell even if the report layout changes.

If you do not want to use this function in a formula outside the pivot table, type the cell address rather than clicking on the cell.