



Analyzing Excel Data Using Pivot Tables

Pivot Tables are interactive worksheet tables you can use to quickly and easily summarize, organize, analyze, and compare large amounts of data without having to build complex formulas. Data in a pivot table report is *cross-tabulated* in two or more ways by combining values from different fields.

Pivot tables are named "pivot" tables because they allow you to easily rotate row and column headings used in the pivot table to analyze the data in different ways.

The Data Source:

The data you use to create the pivot table in Excel can come from several different sources:

	A	B	C	D	E	F
1	Central North Dakota State University					
2	Course Enrollment Statistics					
3	2001 - 2003					
4	Year	Term	Course	Enrolled	Credits	Income
5	2001	Fall	2022	61	2 \$	430
6	2001	Fall	2035	46	4 \$	860
7	2001	Fall	2045	70	1 \$	215
8	2001	Fall	2046	75	0 \$	-
9	2001	Fall	2047	67	1 \$	215
10	2001	Fall	2051	64	0 \$	-
11	2001	Fall	2066	94	3 \$	645
12	2001	Fall	2069	2	2 \$	430
13	2001	Fall	2074	87	4 \$	345

- An Excel list (see "[Using Excel As A Database](#)" for more information about creating lists in your Excel worksheets)

An Excel list

- External database files or tables created in applications like Microsoft Access, FoxPro, dBASE, Oracle, or SQL Server

Since data can be easily extracted from PeopleSoft into Excel, you can quickly create a pivot table and then view that data in just about any way you need to see it. You can also rapidly reorganize the data in the pivot table as your needs change. The source data for your pivot tables will be an Excel list.

Creating Pivot Tables

If your worksheet contains an Excel list, you can specify which data to include in the pivot table by choosing fields and items:

- **Fields** are categories of data (each column in an Excel list is a field)
- **Items** are subcategories of a field

For example, you may have a column (field) in your list labeled Year, and the years 1999, 2000, 2001, 2002, 2003, and 2004 in that column. Year is a field, and 2003 is one *item* in that field, 2004 is another *item*.

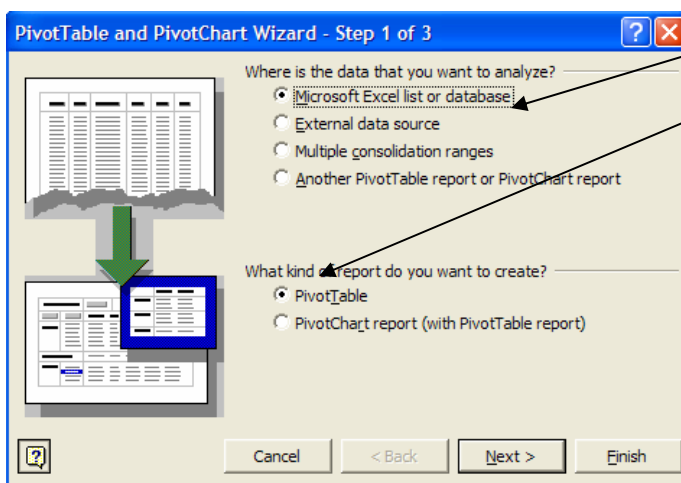
When creating pivot tables, there are two types of fields you can use:

- **Row/Column/Page fields** – usually contain text values (but can contain numerical values). Refers to the specific areas where you place the fields from your source data.
- **Data fields** – usually contain numeric data used for summarizing data with summary functions like SUM, AVERAGE, COUNT, etc. (can also contain text values that can use the count functions). Refers to the Data area where you place fields to be summarized.

Note: Because a pivot table report creates the necessary totals based on the fields you place in the report layout area, you must remove any automatic totals from your Excel list before creating the pivot table.

Create the Pivot Table Using the Pivot Table Wizard

1. Open the source data file (the Excel workbook containing a list of data)
2. Place the cell pointer in any cell **within the list**
3. On the Menu Bar, select Data, PivotTable and PivotChart Report...

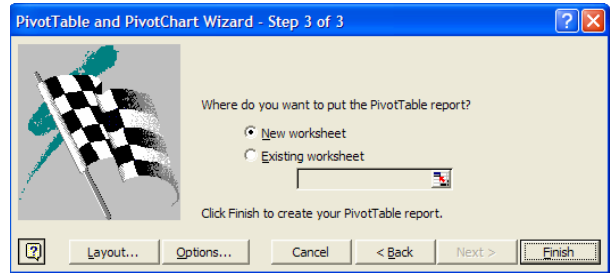


4. Select the *data source* (an Excel list in this example)
5. Select PivotTable
6. Click Next to go to Step 2 of 3 in the Wizard

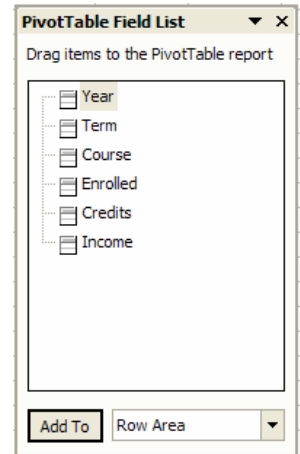
7. Excel automatically selects your list (indicated by the "marching ants" border surrounding the list range)
8. If the list range is incorrect, change the Range: text box to the correct range where your list is stored

	A	B	C	D	E	F
4	Year	Term	Course	Enrolled	Credits	Income
5	2001	Fall	2022	61	2 \$	430
6	2001	Fall	2035	46	4 \$	860
7	2001	Fall	2045	70	1 \$	215
8	2001	Fall	2046	75	0 \$	-
9	2001	Fall	2047	67	1 \$	215
10	2001	Fall	2051	64	0 \$	-
11						345
12						30
13						15
14						60
15						15
16						30
17						15
18	2001	Fall	2085	13	3 \$	645
19	2001	Fall	2086	12	2 \$	615

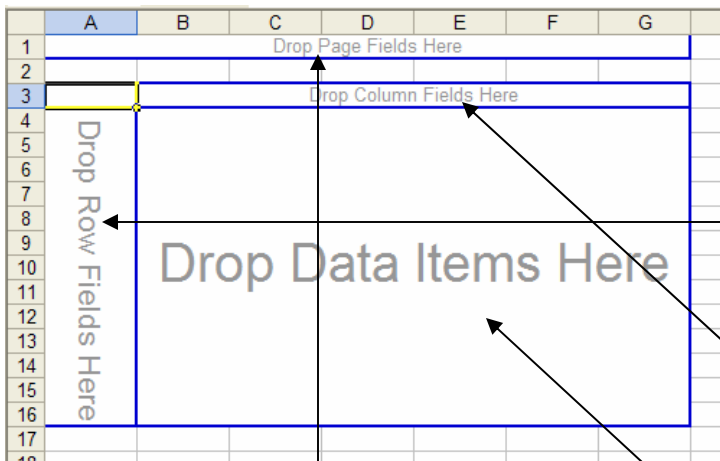
9. Click Next to go to Step 3 of 3 in the Wizard
10. Select New worksheet to create the pivot table on a new sheet in the workbook, **OR**
11. Select Existing worksheet, then type the cell reference where you want to place the pivot table (if you choose an area that already contains data, the pivot table will replace the existing data)
12. Click Finish to create the pivot table report layout grid



The Pivot Table Toolbar (Excel XP and 2000) and the Pivot Table Field List (Excel XP) appears on screen alongside the pivot table grid



Each of the column headings (fields) from the list appear in the Field List.



Drag fields from the Field list to an area of the Pivot Table:

Drag a field to the "Drop Row Fields Here" area to display that field's items as row labels.

Drag a field to the "Drop Column Fields Here" area to display that field's items as column headings.

Drag a field to the "Drop Page Fields Here" area to create a category that can be filtered to display specific items one item at a time.

Drag the field you wish to summarize to the "Drop Data Items Here" area. By default, Excel uses the Sum function to total numerical data fields dropped into the Data area and the Count function if a text field is dropped in the Data area.

In this example:

- The **Course** field was dropped in the Page Field area (cell A1)
- The **Year** field was dropped in the Row Field area (cell A4)
- The **Term** field was dropped in

	A	B	C	D	E	F
1	Course	(All)				
2						
3	Sum of Enrolled	Term				
4	Year	Fall	Spring	SS1	SS2	Grand Total
5	2001	1314	1227	586	1192	4319
6	2002	15677	28917	3333		47927
7	2003			597	7017	7614
8	Grand Total	16991	30144	4516	8209	59860
9						

the Column Field area (cell B3)


- The **Enrolled** field was dropped in the Data area
- The data items from the Enrolled field were totaled using the SUM function (cell A3)

Adding a Field to a Pivot Table

1. Select any cell within the pivot table
2. **Excel XP** – drag a field from the Field List to the Row, Column, Page, or Data area
3. **Excel 2000** – click the Display Fields button on the PivotTable toolbar to display all fields on the toolbar, if necessary, then drag a field from the toolbar to the Row, Column, Page, or Data area
4. This is the same pivot table as the example above – the Term field was dropped to the right of the Year field in the Row area to change the data display slightly

	A	B	C
1	Course	(All)	
2			
3	Sum of Enrolled		
4	Year	Term	Total
5	2001	Fall	1314
6		Spring	1227
7		SS1	586
8		SS2	1192
9	2001 Total		4319
10	2002	Fall	15677
11		Spring	28917
12		SS1	3333
13	2002 Total		47927
14	2003	SS1	597
15		SS2	7017
16	2003 Total		7614
17	Grand Total		59860

Deleting Fields in a Pivot Table

1. Click the cell containing the field you wish to delete to select it
2. Drag the field outside the blue boundaries of the pivot table layout area. The mouse pointer turns into a button with a large red X on it 
3. Release the mouse button
4. A pivot table must have at least one data field (a field dropped in the Data area); you can't delete the data field from the pivot table if only one data field exists.
5. Deleting a field from the Pivot Table **does not** delete the field from the original source data

Deleting an Entire Pivot Table

1. Select all of the cells contained in the pivot table layout area
2. On the Menu Bar, select Edit, Clear, All
3. Deleting a pivot table **does not** delete any of the data from the source data.

Page Fields

If you place a field in the Page Field area of the pivot table, you can filter the data to display one particular item within a field:

The Page field button appears at the top of the pivot table with a drop-down list button next to it.

1. Click on the Page Field's drop-down arrow to display a window which lists all of the items in that field
2. Click the item you wish to display, then click OK

	A	B	C	D	E
1	Course	(All)			
2					
3	Sum of Enrolled				
4	Year				
5	2001				
6					
7					
8					
9	2001 Total				
10	2002				
11					
12					
13	2002 Total				
14	2003				
15		SS2	7017		

Reorganizing the Pivot Table

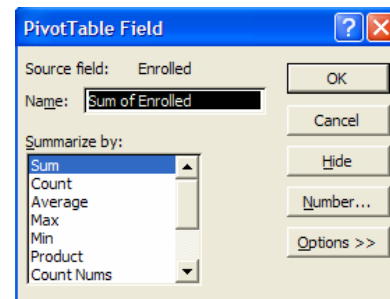
You can quickly change the organization of data in your pivot tables using the mouse to drag Row, Column, or Page fields to other field locations in the table layout area. When you change the organization of the table, you also change the way items in the Data area are summarized.

1. Click the cell containing the field you wish to move
2. Drag that field to a different area (i.e. if it's currently in the Row Field area, drag it to the Column Field area)
3. Release the mouse button

Formatting Pivot Table Data

You can quickly change the format of numbers displayed in the Data area of the pivot table:

1. Select the cell containing the Data field (usually cell A3, displaying Sum of, or another function, then the field name)
2. Click the Field Settings button on the PivotTable Toolbar
3. Click the Number... button in the PivotTable Field dialog box
4. Choose a number format from the Format Cells dialog box
5. Click OK twice to return to the pivot table



Note: Don't use the Format, Cells command from Excel's Menu Bar to format data in a pivot table – if you do, you'll lose all of the applied formatting whenever you refresh the pivot table data.

Changing the Name Displayed on Field Buttons

1. Select the cell containing the field name you wish to change
2. Click the Field Settings button on the PivotTable Toolbar
3. Type the name you want in the Name: text box in the PivotTable field dialog box, then click OK, **OR**
4. Double-click the cell you wish to change, type the new name in the Name: text box and click OK

Changing the Calculation of the Data Field

Excel provides eleven different functions to summarize the original data in the Pivot Table – you're not limited to the default SUM or COUNT functions assigned by the Pivot Table Wizard:

1. Select the cell that displays the function used (usually cell A3 – displays Sum of, or another function)
2. Click the Field Settings button on the PivotTable Toolbar

13. Select the function you want to use from the Summarize by: list box, then click OK

Refreshing Pivot-Table Data

If the source data changes after you've created the pivot table, data summarized in the pivot table isn't automatically recalculated as it is in a normal Excel worksheet.

However, you can still update or **refresh** data:

1. On the Menu Bar, select Data, Refresh Data, **OR**
2. Click the Refresh Data button on the PivotTable Toolbar



Changes that are made when you Refresh the data:

1. Data field changes made in the source data
2. Items or fields deleted from the source data
3. Existing row or field data that have been changed or added in the source data

Rows added to the bottom of the source data range after the pivot table was created will not be included in the Refresh unless you add those rows to the list range manually by returning to Step 2 of the PivotTable Wizard:

1. Click the drop-down list arrow next to PivotTable on the PivotTable Toolbar
2. Click Wizard, then click the Back button to return to Step 2 of the Wizard
3. Change the Range: to include the added rows of data
4. Click Finish

Changing Individual Data Values in the Pivot Table

You can't change the cells in the data area of the pivot table directly, but you can:

- Change the desired data value(s) in the source data, then click Refresh Data on the Pivot Table Toolbar, **OR**
- Copy and Paste the data from the Pivot Table Data area to another worksheet and make the changes there

Grouping Data in a Pivot Table

You can summarize data in a pivot table at different levels than the source data allows by grouping items within pivot table fields. Items can be grouped in one of three ways, depending on the type of item selected:

- By categories (i.e. In the College of Engineering you may have four different departments – you can group the four departments under Engineering so that all of the data is summarized together)
- By ranges, if the data is numeric (i.e. Course Numbers from 100 – 200)
- By larger time units (i.e. group four Months into one Semester)

1. Select the range of items (cells) to group in the pivot table layout area
2. On the Menu Bar, select Data, Group And Outline, Group

Excel creates default group and item names for you. You can change these default names by clicking the cell containing the group name and typing a new group name.

	A	B	C
1		Drop Page F	
2			
3	Sum of Income	Year	
4	Course2	Course	200
5	Group1	2022	43
6		2035	86
7		2045	21
8		2046	
9		2047	21
10		2051	
11		2066	64
12		2069	43
13		2071	21
14		2072	86
15		2075	21
16		2076	43
17		2078	21
18		2085	64
19		2086	64
20		2089	21
21		2095	
22		2096	64

	A	B
1		Drop P
2		
3	Sum of Income	Year
4	Course	200
5		2022 43
6		2035 86
7		2045 21
8		2046
9		2047 21
10		2051
11		2066 64
12		2069 43
13		2071 21
14		2072 86
15		2075 21
16		2076 43
17		2078 21
18		2085 64
19		2086 64
20		2089 21
21		2095
22		2096 64
23		2103 21
24		2105 21

After you Group data, you can delete the field that displays the separate items from the pivot table. When you remove the separate item data, the data summary changes to group all of the items under a group total.

	A	B	C
1		Drop Page Fiel	
2			
3	Sum of Income	Year	
4	Course2	2001	20
5	Group1	6880	898
6		2103	215 30

Ungrouping Grouped Data

1. Click the cell containing the group name to select the group item
2. On the Menu Bar, select Data, Group and Outline, Ungroup

Pivot Chart Reports

After you create a pivot table, you can create a pivot chart report to represent your data graphically.

You can create a pivot chart report from an existing pivot table report, or you can create the pivot chart report from the Pivot Table Wizard, before you create the pivot table report. When you create the pivot chart report first, Excel automatically creates an associated pivot table report.

When you create a pivot chart report from an existing pivot table report, Excel automatically creates a stacked column chart on a separate chart sheet and uses the layout of the pivot table report to determine the placement of fields. The Row fields become Category fields, and the Column fields become Series fields in the pivot chart.



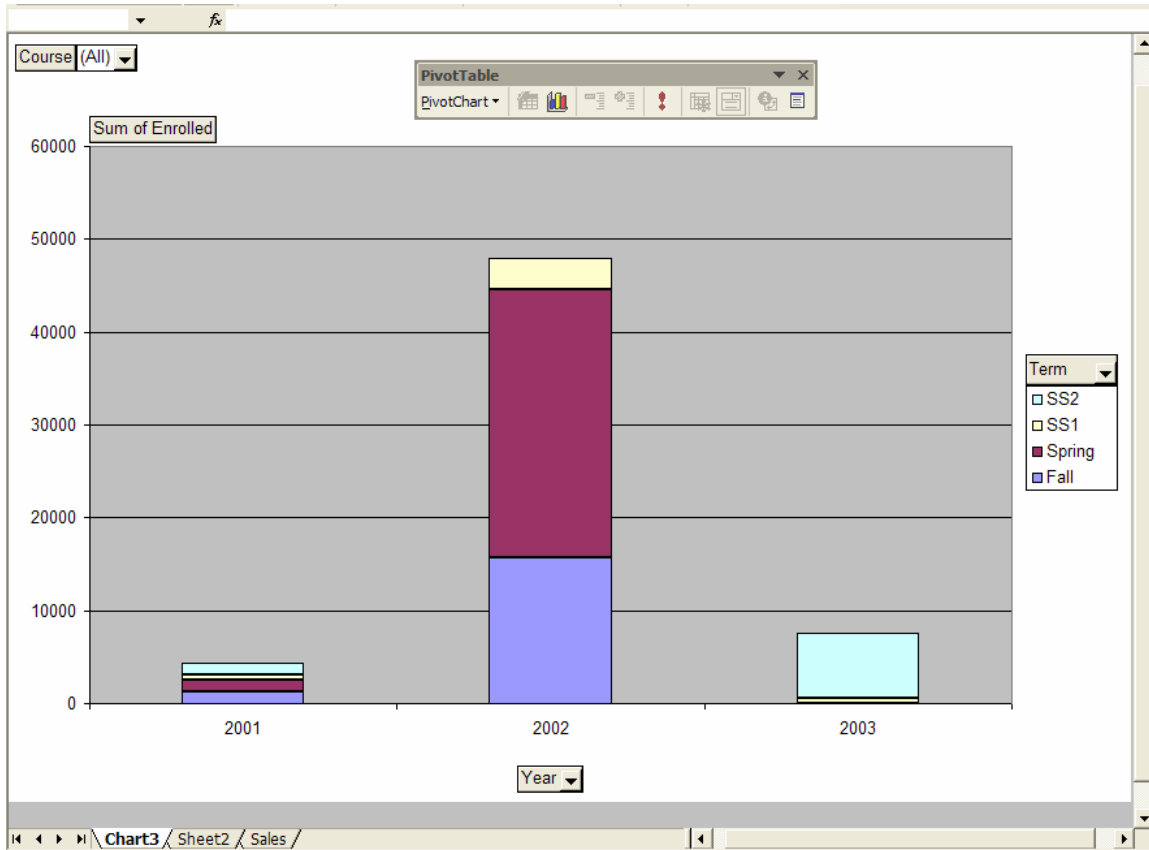
1. Select any cell within the pivot table report
2. On the PivotTable Toolbar, click the Chart Wizard button



If you want to make changes to the pivot chart after you create it, click the Chart Wizard button again, then

make the changes you want using the Chart Toolbar.

Any changes to the source data and/or to the pivot table will be reflected in the pivot chart once you Refresh the data.



**A Pivot Chart Report
created from a Pivot Table
Report**