

EXCEL DATABASE MANAGEMENT
MICROSOFT EXCEL 2003

REFERENCE GUIDE



1 8 6 4

UNIVERSITY TECHNOLOGY SERVICES
COMPUTER TRAINING

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Creating a Powerful Database

Objectives:

When you have completed these lessons, you will be able to:

- ☐ Create database field
 - ☐ Add records manually
 - ☐ Add new record using a built-in data form
 - ☐ Search for the record using data form
 - ☐ Edit and delete the record using data form
 - ☐ Create a list
 - ☐ Find total or other functions in a list
 - ☐ Convert a list to a range
 - ☐ Perform simple and advanced sort
 - ☐ Enable and disable AutoFilter
 - ☐ Apply and remove the criteria
 - ☐ Customize criteria
 - ☐ Define the criteria range
 - ☐ Use the advanced Filter command
 - ☐ Find the sum of specific records using Paste function
 - ☐ Find the average of specific records
 - ☐ Find the maximum and minimum value of specific records
 - ☐ Find the number of records
 - ☐ Use VLOOKUP to find data
 - ☐ Limit the lookup value for exact match
 - ☐ Use the Closet match for the lookup value
- 

CREATING A POWERFUL DATABASE

Creating Database

A database is a **collection of organized information**. Normally, database uses table / list to keep data. Data is made up of **fields** and **records**. Excel worksheet list can be used as a database because the worksheet **columns** serve as **fields** while **rows** serve as **records**.

	Invoice	Month	Sales Person	Product	Sales Value
Records	A001	Feb	John Smith	Wooden Chair	4500
	A002	Feb	Steve Brown	Wooden Desk	2300
	A003	Feb	Mary Davis	Metal Chair	3300
	A004	Feb	John Smith	Wooden Chair	3700
	A005	Feb	Mary Davis	Wooden Desk	5400
	A006	Mar	John Smith	Metal Chair	3100
	A007	Mar	John Cage	Wooden Desk	5200

CREATING A POWERFUL DATABASE

How to Create Database Field

1. Create a new worksheet and rename it to **Database**. Type the field names on the same row, as shown below.

You can change the cell format for the field names as you wish.

	A	B	C	D	E
1					
2	Invoice	Month	Sales Person	Product	Sales Value
3					
4					

How to Add Records Manually

1. Type the record in **row 3**, which is below the field names as shown below.

Do not leave a blank row between the field names and the records.

	A	B	C	D	E
1					
2	Invoice	Month	Sales Person	Product	Sales Value
3	A001	Feb	John Smith	Wooden Chair	4500
4					

CREATING A POWERFUL DATABASE

How to Add New Record Using a Built-In Data Form

SUMMARY

1. Click any cell in the database list.
2. Click **Data >> Form**.
3. Click the **New** button.
4. Type in the record.
5. Press **<Enter>**.
6. Click the **Close** button.

1. Click any cells in the database list.

You can click at any records or the field names. If you use data form to add a new record, Excel will append it after the last record in the database.

	A	B	C	D	E
1					
2	Invoice	Month	Sales Person	Product	Sales Value
3	A001	Feb	John Smith	Wooden Chair	4500
4					

2. From the menu, click **Data >> Form**.

The data form appears. All the fields appear in the form automatically. By default, the first record appears in the form.

The screenshot shows the 'Database' form window. On the left, there are input fields for 'Invoice:' (A001), 'Month:' (Feb), 'Sales Person:' (John Smith), 'Product:' (Wooden Chair), and 'Sales Value:' (4500). On the right, there are buttons: 'New' (highlighted with a red box), 'Delete', 'Restore', 'Find Prev', 'Find Next', 'Criteria', and 'Close'. The status bar at the top right indicates '1 of 1'.

3. Click the **New** button.

A new blank form appears.

The screenshot shows the 'Database' form window with a new blank record. The input fields on the left are now empty. The buttons on the right are the same, but the 'New' button is no longer highlighted. The status bar at the top right indicates 'New Record'.

CREATING A POWERFUL DATABASE

4. Type the new record information as shown below.

Press <Tab> to go to next field. If you press <Enter> after entering the invoice number, a new blank form appears for you to add a new record.

5. Press <Enter> to create new record.

Alternatively, click the New button to create new record. Enter all the records as shown below.

Invoice	Month	Sales Person	Product	Sales Value
A001	Feb	John Smith	Wooden Chair	4500
A002	Feb	Steve Brown	Wooden Desk	2300
A003	Feb	Mary Davis	Metal Chair	3300
A004	Feb	John Smith	Wooden Chair	3700
A005	Feb	Mary Davis	Wooden Desk	5300
A006	Mar	John Smith	Metal Chair	3100
A007	Mar	John Cage	Wooden Desk	5200

6. Click the **Close** button.

You have finished updating the database.

CREATING A POWERFUL DATABASE

Managing Record in a Database

There are tools to help you manage your database records. You can search, edit and delete records easily in Excel.

How to Search For the Record Using Data Form

SUMMARY

1. Click any cell in the database list.
2. Click **Data >> Form**.
3. Click the **Criteria** button.
4. Type the criteria in the respective fields.
5. Click the **Find Next** button to find next record.
6. Click the **Find Previous** button to find previous record.
7. Click the **Close** button.

TIPS

- You can also enter multiple criteria as shown below.

Sales Person: Mary Davis
Product:
Sales Value: >4000

1. Click any cell in the database list. From the menu, click **Data >> Form**.

The data form appears.

2. Click the **Criteria** button.

A blank form appears for you to set the criteria.

The screenshot shows the 'Database' form with the following fields: Invoice: A001, Month: Feb, Sales Person: John Smith, Product: Wooden Chair, Sales Value: 4500. On the right side, there are buttons: New, Delete, Restore, Find Prev, Find Next, **Criteria** (highlighted with a red box), and Close. The status bar at the top right indicates '1 of 7'.

3. In the **Sales Person** box, type **Mary Davis**.

You want to find records for Mary Davis.

The screenshot shows the 'Database' form with the 'Criteria' tab selected. The fields are: Invoice: , Month: , Sales Person: Mary Davis (highlighted with a red box), Product: , Sales Value: . On the right side, there are buttons: New, Clear, Restore, Find Prev, Find Next, Form, and Close.

CREATING A POWERFUL DATABASE

4. Click the Find Next button.

The first record for Mary Davis is shown in the form.

The screenshot shows a 'Database' form window with a blue title bar and a close button (X) in the top right corner. The form contains several input fields on the left and a set of buttons on the right. The input fields are: 'Invoice:' with the value 'A003', 'Month:' with the value 'Feb', 'Sales Person:' with the value 'Mary Davis', 'Product:' with the value 'Metal Chair', and 'Sales Value:' with the value '3300'. The buttons on the right are: 'New', 'Delete', 'Restore', 'Find Prev', 'Find Next' (which is highlighted with a blue border), 'Criteria', and 'Close'. A vertical scrollbar is located between the input fields and the buttons. The text '3 of 7' is displayed in the top right corner of the form area.

5. Click the Find Next button.

The second record for Mary Davis appears in the form.

The screenshot shows the same 'Database' form window, but the data has changed. The input fields now show: 'Invoice:' with the value 'A005', 'Month:' with the value 'Feb', 'Sales Person:' with the value 'Mary Davis', 'Product:' with the value 'Wooden Desk', and 'Sales Value:' with the value '5300'. The 'Find Next' button remains highlighted. The text '5 of 7' is displayed in the top right corner of the form area.

6. Click the Find Prev button.

The previous record that meets the criteria appears.

7. Click the Close button.

The form closes and returns to the worksheet.

CREATING A POWERFUL DATABASE

How to Edit / Delete the Record Using Data Form

SUMMARY

1. Click any cell in the database list.
2. Click **Data >> Form**.
3. Click the **Criteria** button.
4. Type the criteria in the respective fields.
5. Click the **Find Next** button.
6. Edit the record.
7. Click the **Close** button.

TIPS

- Click the **Restore** button or just press **<Esc>** to undo the changes while editing a record. If you have closed the data form or move on to edit another record, you can't restore the records.
- Click the **Delete** button to delete the current record.
- You can also edit / delete record manually on the worksheet without using the data form.

1. Click any cell in the database list. From the menu, click **Data >> Form**.

The data form appears.

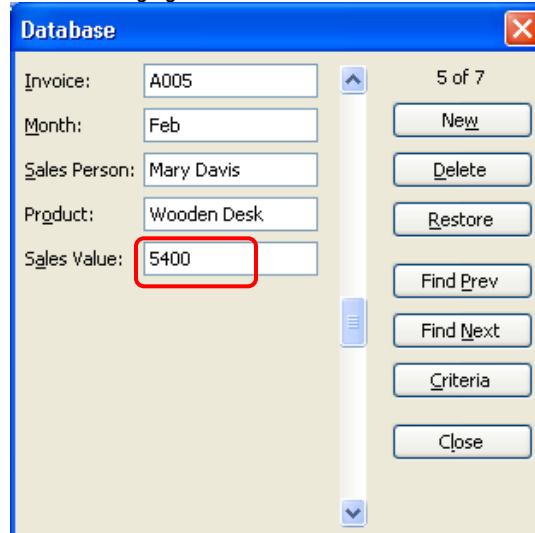
2. Set the criteria **Sales Person** equals to **Mary Davis** and **Sales Value** is more than **4000**. Press the **Find Next** button.

You want to search the records for Mary Davis, which have sales value more than 4000.

Sales Person:	Mary Davis
Product:	
Sales Value:	>4000

3. In the **Sales Value** box, type **5400**.

You are changing the Sales Value from 5300 to 5400.



4. Press **<Enter>** or click the **Close** button.

The changes are confirmed and the form closes.

CREATING A POWERFUL DATABASE

How to Create a List

SUMMARY

1. Select the cells you want to define as a list.
2. Click **Data >> List >> Create List**.
3. Click the **OK** button.

TIPS

- After creating the list, you can sort the records, add new records and perform simple data analysis easily.

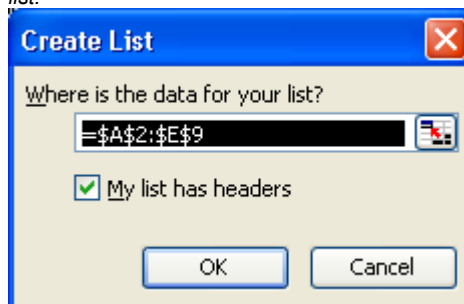
1. Select the range **A2:E9**.

This is the range that you want to define as a list.

	A	B	C	D	E	F
1						
2	Invoice	Month	Sales Person	Product	Sales Value	
3	A001	Feb	John Smith	Wooden Chair	4500	
4	A002	Feb	Steve Brown	Wooden Desk	2300	
5	A003	Feb	Mary Davis	Metal Chair	3300	
6	A004	Feb	John Smith	Wooden Chair	3700	
7	A005	Feb	Mary Davis	Wooden Desk	5400	
8	A006	Mar	John Smith	Metal Chair	3100	
9	A007	Mar	John Cage	Wooden Desk	5200	
10						

2. From the menu, click **Data >> List >> Create List**.

The Create List dialog box appears. You can also press <Ctrl>+<L> to create a list.



3. Click the **OK** button.

The list is created. You will see that the last row of the list is a blank row with a blue asterisk (). You can add a new record by clicking the last row and type in the information.*

	A	B	C	D	E
1					
2	Invoice	Month	Sales Person	Product	Sales Value
3	A001	Feb	John Smith	Wooden Chair	4500
4	A002	Feb	Steve Brown	Wooden Desk	2300
5	A003	Feb	Mary Davis	Metal Chair	3300
6	A004	Feb	John Smith	Wooden Chair	3700
7	A005	Feb	Mary Davis	Wooden Desk	5400
8	A006	Mar	John Smith	Metal Chair	3100
9	A007	Mar	John Cage	Wooden Desk	5200
10	*				

CREATING A POWERFUL DATABASE

How to Find Total in a List

SUMMARY

1. Click any cell in the list.
2. Click **Data >> List >> Total Row**.
3. Click the cell that contains the total value.
4. Click the drop-down arrow.
5. Select the function you want from the list.

1. Click any cell in the list.

You want to find the total sales value for the current list.

2. From the menu, click **Data >> List >> Total Row**.

The total row appears at the end of the list to show the total for the sales value.

Invoice	Month	Sales Person	Product	Sales Value
A001	Feb	John Smith	Wooden Chair	4500
A002	Feb	Steve Brown	Wooden Desk	2300
A003	Feb	Mary Davis	Metal Chair	3300
A004	Feb	John Smith	Wooden Chair	3700
A005	Feb	Mary Davis	Wooden Desk	5400
A006	Mar	John Smith	Metal Chair	3100
A007	Mar	John Cage	Wooden Desk	5200
*				
Total				27500

How to Switch Functions in a List

TIPS

- You can show the **List** toolbar to help you work on your list more easily.

1. Click the cell **E11**. Click the drop-down arrow.

A list of functions appears for you to select.

A007	Mar	John Cage	Wooden Desk	5200
*				
Total				27500
				None
				Average
				Count
				Count Nums
				Max
				Min
				Sum
				StdDev
				Var

2. Click **Average** from the list.

The Average of the sales value appears, as shown below.

A007	Mar	John Cage	Wooden Desk	5200
*				
Total				3928.571429

CREATING A POWERFUL DATABASE

How to Convert a List to a Range

SUMMARY

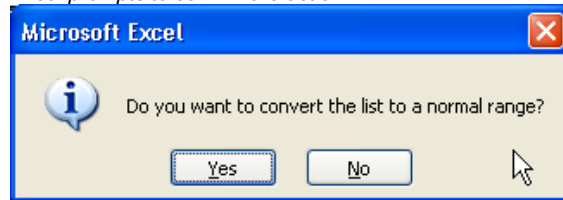
1. Click any cell in the list.
2. Click **Data >> List >> Convert to Range**.
3. Click the **Yes** button.

1. Click any cell in the list.

You want to change the current list back to a normal cell range.

2. From the menu, click **Data >> List >> Convert to Range**.

Excel prompts to confirm the action.



3. Click the **Yes** button.

The list is converted back to a normal range. the blue outline for the list disappears. Note that the total row remains on the worksheet.

Invoice	Month	Sales Person	Product	Sales Value
A001	Feb	John Smith	Wooden Chair	4500
A002	Feb	Steve Brown	Wooden Desk	2300
A003	Feb	Mary Davis	Metal Chair	3300
A004	Feb	John Smith	Wooden Chair	3700
A005	Feb	Mary Davis	Wooden Desk	5400
A006	Mar	John Smith	Metal Chair	3100
A007	Mar	John Cage	Wooden Desk	5200
Total				3928.571429

CREATING A POWERFUL DATABASE

Sorting Records

You can sort **ascending** or **descending** the records using **any fields** in the database. You are able to **sort multiple fields** too.

How to Perform Simple Sort

SUMMARY

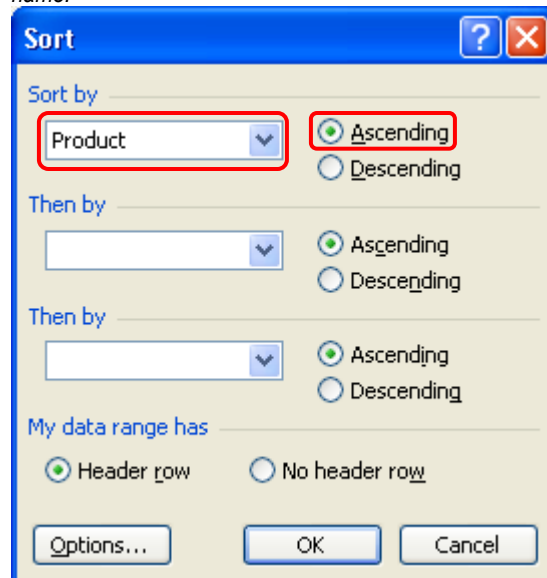
1. Click any cell in database list.
2. Click **Data >> Sort**.
3. Specify the sorting criteria in the **Sort by** box.
4. Click **Ascending / Descending** option button.
5. Click the **OK** button.

1. Click any cell in the database list. From the menu, click **Data >> Sort**.

The Sort dialog box appears.

2. Click the **Sort by** drop-down arrow, click **Product**, and then click the **Ascending** option button.

You have just set the sorting criteria. Excel will sort the records by the Product name.



3. Click the **OK** button.

The database is sorted by product, as shown below.

Invoice	Month	Sales Person	Product	Sales Value
A003	Feb	Mary Davis	Metal Chair	3300
A006	Mar	John Smith	Metal Chair	3100
A001	Feb	John Smith	Wooden Chair	4500
A004	Feb	John Smith	Wooden Chair	3700
A002	Feb	Steve Brown	Wooden Desk	2300
A005	Feb	Mary Davis	Wooden Desk	5400
A007	Mar	John Cage	Wooden Desk	5200

CREATING A POWERFUL DATABASE

How to Perform Multiple Sort

SUMMARY

1. Click any cell in database list.
2. Click **Data >> Sort**.
3. Specify the sorting criteria in the **Sort by** and **Then by** box.
4. Click **Ascending / Descending** option button for each criteria.
5. Click the **OK** button.

1. Click any cell in the database list. From the menu, click **Data >> Sort**.
The Sort dialog box appears.
2. Click the **Sort by** drop-down arrow, click **Product**, and then click the **Ascending** option button.
Click the **Then by** drop-down arrow, click **Sales Value**, and then click the **Descending** option button.

You have just set the two sorting criteria. First, Excel will sort ascending by Product and then sort Descending by Sales Value.

3. Click the **OK** button.

The database is sorted by product and then by the highest sales.

Invoice	Month	Sales Person	Product	Sales Value
A003	Feb	Mary Davis	Metal Chair	3300
A006	Mar	John Smith	Metal Chair	3100
A001	Feb	John Smith	Wooden Chair	4500
A004	Feb	John Smith	Wooden Chair	3700
A005	Feb	Mary Davis	Wooden Desk	5400
A007	Mar	John Cage	Wooden Desk	5200
A002	Feb	Steve Brown	Wooden Desk	2300

CREATING A POWERFUL DATABASE

How to Set Advanced Sort Options

SUMMARY

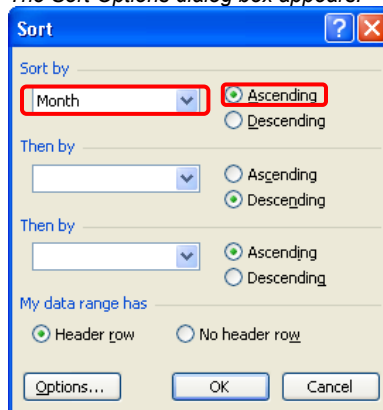
1. Click any cell in database list.
2. Click **Data >> Sort**.
3. Specify the sorting criteria in the **Sort by** box.
4. Click **Ascending / Descending** option button for the criteria.
5. Click the **Options** button.
6. Click to select the options you want.
7. Click the **OK** button.
8. Click the **OK** button to return to Excel.

1. Click any cell in the database list. From the menu, click **Data >> Sort**.

The Sort dialog box appears.

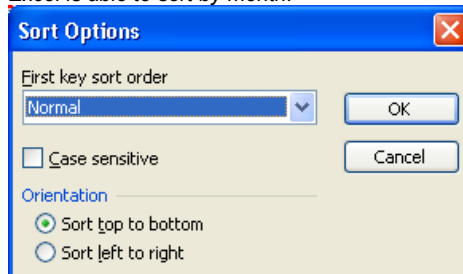
2. Click the **Sort by** drop-down arrow, click **Month**, and then click the **Ascending** option button.

The Sort Options dialog box appears.



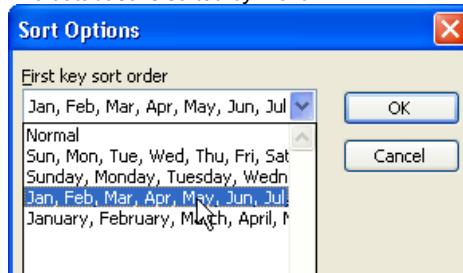
3. Click the **First key sort order** drop-down arrow.

Excel is able to sort by month.



4. Click to select **Jan, Feb,.....** from the list. Click the **OK** button. Then, click the **OK** button to close the **Sort Options** dialog box.

The database is sorted by month.



CREATING A POWERFUL DATABASE

Using AutoFilter

At times, you may want to show only the essential records. You can temporarily hide all the rows that do not meet your requirements. If you have defined the range as a list, you can filter the records using the drop-down arrows that appear on each field name. If you have not defined the range as a list, Excel provides a built-in AutoFilter, a filtering mechanism that allows you to apply simple criteria to filter the records.

How to Enable / Disable AutoFilter

SUMMARY

1. Click any cell in database list.
2. Click **Data >> Filter >> AutoFilter**.
3. Click **Data >> Filter >> AutoFilter** again to disable AutoFilter.

1. Click any cell in the database list. From the menu, click **Data >> Filter >> AutoFilter**.

Drop-down arrows appear at each field name, as displayed below.

Invoice	Month	Sales Person	Product	Sales Value
A001	Feb	John Smith	Wooden Chair	4500

2. From the menu, click **Data >> Filter >> AutoFilter**.

Drop-down arrows disappear from all the field names, as displayed below.

Invoice	Month	Sales Person	Product	Sales Value
A001	Feb	John Smith	Wooden Chair	4500

How to Apply / Remove the Criteria

SUMMARY

1. To apply criteria, click the field drop-down arrow, and then click the criteria you want.
2. To remove criteria, click the field drop-down arrow, and then click **(All)**.

1. Click the **Month** drop-down arrow and click **Mar**.

The database will show only the Feb records.

Invoice	Month	Sales Person
A001	Sort Ascending	John Smith
A002	Sort Descending	Steve Brown
A003	(All)	Mary Davis
A004	(Top 10...)	John Smith
A005	(Custom...)	Mary Davis
A006	Feb	John Smith
A007	Mar	John Cage

Invoice	Month	Sales Person
A006	Mar	John Smith
A007	Mar	John Cage

2. Click the **Month** drop-down arrow and click **(All)**.

The database will be reset to show all the records in the list.

CREATING A POWERFUL DATABASE

How to Customize Criteria

SUMMARY

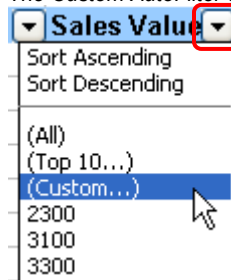
1. Click the drop-down arrow for the field you want to filter.
2. Click **(Custom...)** from the list.
3. Enter the criteria.
4. Click the **OK** button.

TIPS

- If you want to include another set of criteria in the filter, click **And** or **Or** option button, and then specify the criteria below it.

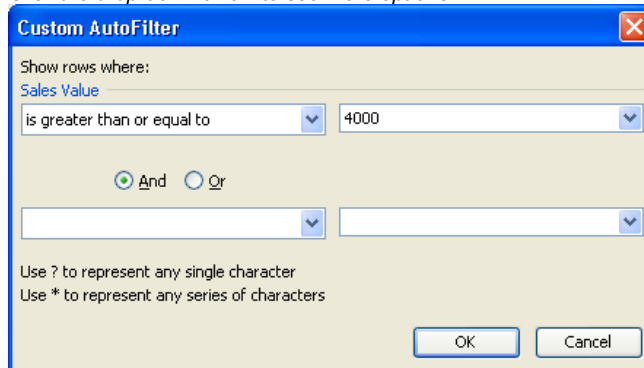
1. Click the **Sales Value** drop-down arrow and click **(Custom...)** from the list.

The Custom AutoFilter dialog box appears.



2. Enter the criteria **Sales Value is greater than or equal to 4000**, as shown below.

Click the drop-down arrow to see more options.



3. Click the **OK** button.

The database will filter the list and show the records that meet the customized criteria.

Invoice	Month	Sales Person	Product	Sales Value
A001	Feb	John Smith	Wooden Chair	4500
A005	Feb	Mary Davis	Wooden Desk	5400
A007	Mar	John Cage	Wooden Desk	5200

CREATING A POWERFUL DATABASE

How to Use Wildcard in Criteria

SUMMARY

1. Click the drop-down arrow for the field you want to filter.
2. Click **(Custom...)** from the list.
3. Set the criteria using the wildcard symbol in the criteria box.
4. Click the **OK** button.

TIPS

- The asterisk ***** represents any series of characters.
- The question mark **?** represents any single character.

1. Click the **Product** drop-down arrow and click **(Custom...)** from the list.

The Custom AutoFilter dialog box appears.

Sales Person	Product	Sales Value
John Smith	Sort Ascending	4500
Steve Brown	Sort Descending	2300
Mary Davis	(All)	3300
John Smith	(Top 10...)	3700
Mary Davis	(Custom...)	5400
John Smith	Metal Chair	3100
John Cage	Wooden Chair	
	Wooden Desk	5200

2. Specify Product **equals** ***Chair**.

The asterisk represents any series of characters. This will filter all products with the name ends with chair.

The Custom AutoFilter dialog box is shown. It has a title bar 'Custom AutoFilter' with a close button. Inside, it says 'Show rows where:'. Below this, the 'Product' field is selected. The criteria is set to 'equals' and the value is '*Chair'. There are radio buttons for 'And' and 'Or'. Below these are two empty dropdown menus. At the bottom, there are instructions: 'Use ? to represent any single character' and 'Use * to represent any series of characters'. There are 'OK' and 'Cancel' buttons at the bottom right.

3. Click the **OK** button.

All the records that have the product name end with the word 'Chair' will be shown.

Invoice	Month	Sales Person	Product	Sales Value
A001	Feb	John Smith	Wooden Chair	4500
A003	Feb	Mary Davis	Metal Chair	3300
A004	Feb	John Smith	Wooden Chair	3700
A006	Mar	John Smith	Metal Chair	3100

CREATING A POWERFUL DATABASE

Using Advanced Filter

At times, you may want to apply more than 2 criteria (AutoFilter is limited to 2 criteria), you can use the **complex filter** instead. You can use advanced filter to accomplish the filtering task. Before you use the Advance Filter command, you have to **set up and define the criteria range** on the worksheet.

To Define the Criteria Range

- Use any cell on the worksheet to define the criteria.
- The criteria value is defined below the field name.
- Use a different row for **OR** criteria
- Use the same row but different column for **AND** criteria

	Field Name	Field Name
OR	Criteria1	Criteria2
	Criteria3	

Important:

- The field names and the criteria in the criteria range are **NOT case sensitive** but the spelling and the spacing must be **exact match** in the database records.
- You can place the criteria range anywhere you want. You can define it on the same worksheet, another worksheet or even a different workbook.

For example:

Invoice	Month	Sales Person	Product	Sales Value
A001	Feb	John Smith	Wooden Chair	4500
A002	Feb	Steve Brown	Wooden Desk	2300
A003	Feb	Mary Davis	Metal Chair	3300
A004	Feb	John Smith	Wooden Chair	3700
A005	Feb	Mary Davis	Wooden Desk	5400
A006	Mar	John Smith	Metal Chair	3100
A007	Mar	John Cage	Wooden Desk	5200
Sales Person				
John Smith				
Steve Brown				
Mary Davis				

CREATING A POWERFUL DATABASE

How to Define the Criteria Range

1. Type the following criteria range in the cell **A12:A15** if you want to find records that belong to **John Smith** OR **Steve Brown** OR **Mary Davis**.

The field name is not case sensitive but the spelling and the spacing must be exact match with the field name in the database.

Sales Person
John Smith
Steve Brown
Mary Davis

Examples:

Use the following criteria range if you want to find records with the **sales value more than 3000 AND less or equals to 4000**.

Sales Value	Sales Value
>3000	<=4000

Use the following criteria range if you want to find records that belong to **Mary Davis OR any other sales person who has sales value more than 4000**.

Sales Person	Sales Value
Mary Davis	
	>4000

CREATING A POWERFUL DATABASE

How to Use the Advanced Filter Command

SUMMARY

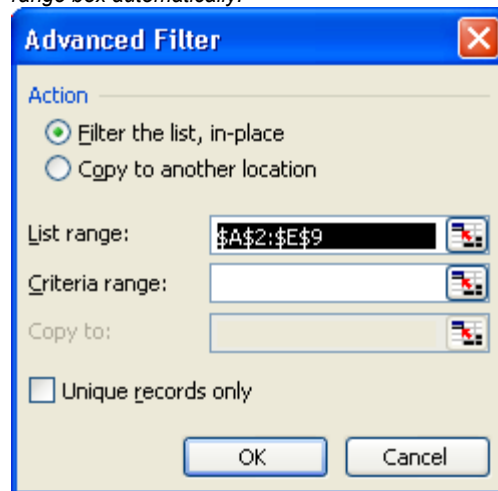
1. Define a criteria range on the worksheet.
2. Click the database.
3. Click **Data >> Filter >> Advanced Filter**.
4. Select the criteria range.
5. Click the **OK** button.

TIPS

- If you want to remove the filter and display all the records again, click **Data >> Filter >> Show All**.
- In the Advanced Filter dialog box, click **Copy to another location** option button if you want the filtered list to be copied to another location.

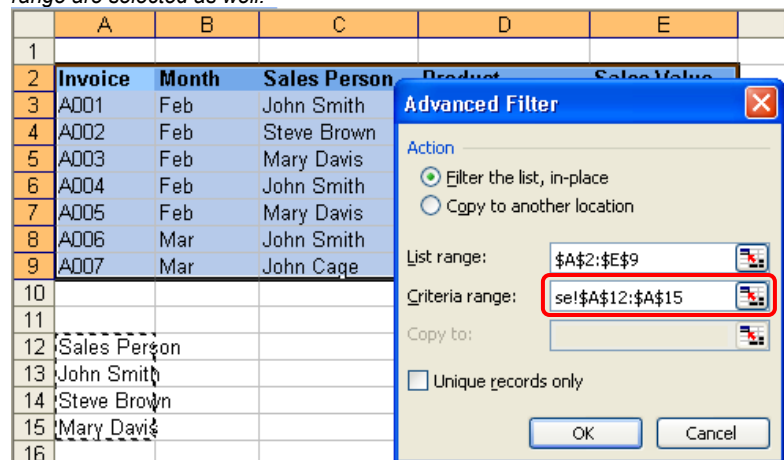
1. Click in the database list. From the menu, click **Data >> Filter >> Advanced Filter**.

The Advanced Filter dialog box appears. the database range appears in the List range box automatically.



2. Click in the **Criteria range** box, select range **A12:A15**.

A12:A15 is where you define your criteria. If you can't see the criteria range, click Select Range button. the Advanced Filter dialog box collapses to let you spot the criteria range more easily. Make sure the field names in the criteria range are selected as well.



3. Click the **OK** button.

The database is filtered.

CREATING A POWERFUL DATABASE

Using Simple Database Functions

Microsoft Excel provides powerful database functions that perform calculations specifically for records that appear in a list or a database. Each database function needs three arguments.

Dfunction(Database,Field,Criteria)

Arguments	Description
Database	The range of cells that make up the list or database
Field	The cell, which contains the field name for the field you want to calculate in the function.
Criteria	The range of cells where the criteria / conditions for the function are stated. (To define the criteria, refer to the task How to Define Criteria Range in Advanced Filter lesson)

Note:

- The criteria range could be placed anywhere on the current worksheets or on different worksheets. However, try to avoid placing it below the database list, which will prevent the database from expanding its records.
- The criteria range should not overlap the database list.

	A	B	C	D	E	F	G	H	I
1									
2		Invoice	Month	Sales Person	Product	Sales Value			
3		A001	Feb	John Smith	Wooden Chair	4500			
4		A002	Feb	Steve Brown	Wooden Desk	2300			
5		A003	Feb	Mary Davis	Metal Chair	3300			
6		A004	Feb	John Smith	Wooden Chair	3700			
7		A005	Feb	Mary Davis	Wooden Desk	5400			
8		A006	Mar	John Smith	Metal Chair	3100			
9		A007	Mar	John Cage	Wooden Desk	5200			

CREATING A POWERFUL DATABASE


There are many functions in Excel that analyze data in a list or a database. The following table shows you some of the common database functions that are frequently used.

Database Functions	Description
DSUM	Sum up the total value for records that meet the criteria.
DAVERAGE	Calculate the average value for records that meet the criteria.
DMAX	Find the maximum value for records that meet the criteria.
DMIN	Find the minimum value for records that meet the criteria.
DCOUNT	Count the occurrences of records that contain numbers in the specific field that meet the criteria.
DCOUNTA	Count the occurrences of records that contain non-blank cell in the specific field that meet the criteria.

CREATING A POWERFUL DATABASE

How to Find the Sum Of Specific Records Using Paste Function

SUMMARY

1. Click the cell where you want to place the formula.
2. Click .
3. In the **select a category** box, click the drop-down arrow and click the function category you want.
4. In the **Select a function** box, scroll and click the function you want.
5. Click the **OK** button.
6. In the **Database**, **Field** and **Criteria** boxes, specify the appropriate cell ranges.
7. Click the **OK** button.

Before you begin, create a new worksheet and enter the database list, as shown below. You can also copy the database list that you have created in previous lesson and paste it on the cell B2 in this new worksheet.

1. Click the cell **F11**.

This is where you want to place the total of the sales value for John Smith.

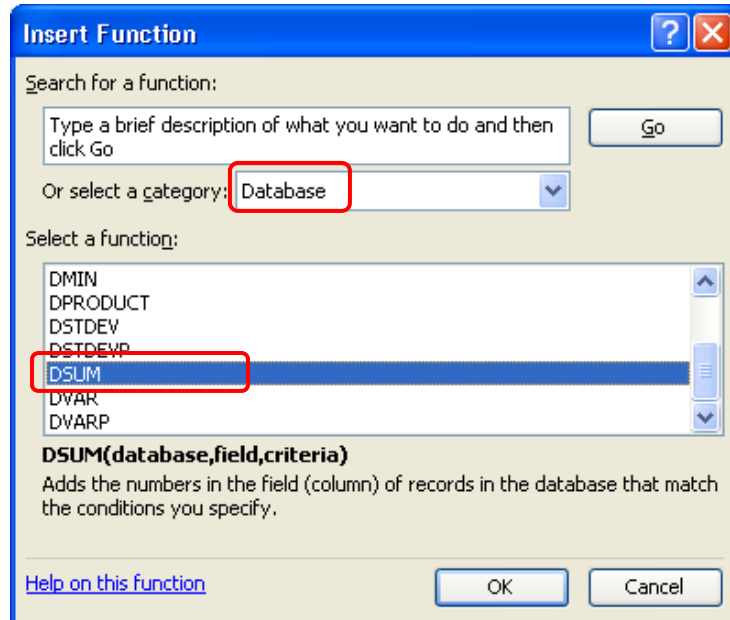
	A	B	C	D	E	F	G	H	I
1									
2		Invoice	Month	Sales Person	Product	Sales Value			
3		A001	Feb	John Smith	Wooden Chair	4500			
4		A002	Feb	Steve Brown	Wooden Desk	2300			
5		A003	Feb	Mary Davis	Metal Chair	3300			Sales Person
6		A004	Feb	John Smith	Wooden Chair	3700			John Smith
7		A005	Feb	Mary Davis	Wooden Desk	5400			
8		A006	Mar	John Smith	Metal Chair	3100			
9		A007	Mar	John Cage	Wooden Desk	5200			
10									
11									

2. Click **Insert function** button on the Formula Bar.

The Insert Function dialog appears.

3. In the **select a category** box, click the drop-down arrow and click **Database** from the list. in the **Select a function** box, scroll down and click **DSUM** function.

You want to use the DSUM function to calculate the total sales value for John Smith.



CREATING A POWERFUL DATABASE

4. Click the OK button.

In the **Database** box, select the range **B2:F9**.

In the **Field** box, select the cell **F2**.

In the **Criteria** box, select the range **I4:I5**.

The arguments for the function are shown below.

The image shows the 'Function Arguments' dialog box for the DSUM function. The dialog has a title bar 'Function Arguments' with a close button. Inside, the function name 'DSUM' is displayed. There are three input boxes: 'Database' with the value 'B2:F9', 'Field' with the value 'F2', and 'Criteria' with the value 'I4:I5'. To the right of each box is a small icon and a description: for Database, it says '= {"Invoice", "Month", "'; for Field, it says '= "Sales Value"'; and for Criteria, it says '= I4:I5'. Below these boxes, the result '= 11300' is shown. A description of the function is provided: 'Adds the numbers in the field (column) of records in the database that match the conditions you specify.' Below this, a definition of 'Criteria' is given: 'Criteria is the range of cells that contains the conditions you specify. The range includes a column label and one cell below the label for a condition.' At the bottom, the 'Formula result =' is shown as '11300'. There is a link 'Help on this function' and 'OK' and 'Cancel' buttons.

Argument	Value	Description
Database	B2:F9	= {"Invoice", "Month", "
Field	F2	= "Sales Value"
Criteria	I4:I5	= I4:I5

= 11300

Adds the numbers in the field (column) of records in the database that match the conditions you specify.

Criteria is the range of cells that contains the conditions you specify. The range includes a column label and one cell below the label for a condition.

Formula result = 11300

[Help on this function](#) OK Cancel

5. Click the OK button.

The result is shown on the worksheet.

What is the total sales value for John Smith? 11300

CREATING A POWERFUL DATABASE

How to Find the Average Of Specific Records

SUMMARY

1. Click the cell where you want to place the formula.
2. Type in the **=DAVERAGE()** function and specify its arguments.
3. Press **<Enter>**.

TIPS

- You can use mouse to select the cells for the arguments instead of typing the cell references while creating the function.

1. Click the cell **F12**.

This is where you want to place the average of sales value for John Smith.

	A	B	C	D	E	F	G	H	I
1									
2		Invoice	Month	Sales Person	Product	Sales Value			
3		A001	Feb	John Smith	Wooden Chair	4500			
4		A002	Feb	Steve Brown	Wooden Desk	2300			
5		A003	Feb	Mary Davis	Metal Chair	3300			
6		A004	Feb	John Smith	Wooden Chair	3700			
7		A005	Feb	Mary Davis	Wooden Desk	5400			
8		A006	Mar	John Smith	Metal Chair	3100			
9		A007	Mar	John Cage	Wooden Desk	5200			
10									
11		What is the total sales value for John Smith?				11300			
12		What is the average sales value for John Smith?							

2. Enter the formula **=DAVERAGE(B2:F9,F2,I4:I5)**.

The formula appears as shown below.

What is the total sales value for John Smith?	11300		
What is the average sales value for John Smith?	=DAVERAGE(B2:F9,F2,I4:I5)		

3. Press **<Enter>**.

The average sales value appears as shown below.

What is the total sales value for John Smith?	11300		
What is the average sales value for John Smith?	3766.666667		

CREATING A POWERFUL DATABASE

How to Find the Maximum / Minimum Value Of Specific Records

SUMMARY

1. Click the cell where you want to place the formula.
2. Type in the **=DMAX()** function and specify its arguments.
3. Press **<Enter>**.

TIPS

- If you want to find minimum sales value, use **DMIN()** function.

1. Click the cell **F13**.

This is where you want to place the maximum sales value for John Smith in Feb.

	A	B	C	D	E	F	G	H	I	J
1										
2		Invoice	Month	Sales Person	Product	Sales Value				
3		A001	Feb	John Smith	Wooden Chair	4500				
4		A002	Feb	Steve Brown	Wooden Desk	2300			Sales Person	Month
5		A003	Feb	Mary Davis	Metal Chair	3300			John Smith	Feb
6		A004	Feb	John Smith	Wooden Chair	3700				
7		A005	Feb	Mary Davis	Wooden Desk	5400				
8		A006	Mar	John Smith	Metal Chair	3100				
9		A007	Mar	John Cage	Wooden Desk	5200				
10										
11		What is the total sales value for John Smith?				11300				
12		What is the average sales value for John Smith?				3766.666667				
13		What is the highest sales value for John Smith in Feb?								

2. Enter the formula **=DMAX(B2:F9,F2,I4:J5)**.

The formula appears as shown below. Note that the criteria range includes the cells J4 and J5, which adds the criteria for Feb.

What is the total sales value for John Smith?	11300		
What is the average sales value for John Smith?	3766.666667		
What is the highest sales value for John Smith in Feb?	=DMAX(B2:F9,F2,I4:J5)		

3. Press **<Enter>**.

The maximum sales value appears as shown below.

What is the total sales value for John Smith?	11300
What is the average sales value for John Smith?	3766.666667
What is the highest sales value for John Smith in Feb?	4500

CREATING A POWERFUL DATABASE

How to Find the Number Of Records

SUMMARY

1. Click the cell where you want to place the formula.
2. Type in the **=DCOUNTA()** function and specify its arguments.
3. Press **<Enter>**.

TIPS

- If you are using the function **DCOUNT()**, you have to use field that contains value.

1. Click the **cell F14**.

This is where you want to count the occurrences of records for John Smith in Feb.

	A	B	C	D	E	F	G	H	I	J
1										
2		Invoice	Month	Sales Person	Product	Sales Value				
3		A001	Feb	John Smith	Wooden Chair	4500				
4		A002	Feb	Steve Brown	Wooden Desk	2300			Sales Person	Month
5		A003	Feb	Mary Davis	Metal Chair	3300			John Smith	Feb
6		A004	Feb	John Smith	Wooden Chair	3700				
7		A005	Feb	Mary Davis	Wooden Desk	5400				
8		A006	Mar	John Smith	Metal Chair	3100				
9		A007	Mar	John Cage	Wooden Desk	5200				
10										
11		What is the total sales value for John Smith?				11300				
12		What is the average sales value for John Smith?				3766.666667				
13		What is the highest sales value for John Smith in Feb?				4500				
14		How many records for John Smith in Feb?								

2. Enter the formula **=DCOUNTA(B2:F9,B2,I4:J5)**.

The formula appears as shown below. Note that the field range is changed to B2. You can use any fields in the database because the function is counting the occurrences, not the value in the field.

What is the total sales value for John Smith?	11300		
What is the average sales value for John Smith?	3766.666667		
What is the highest sales value for John Smith in Feb?	4500		
How many records for John Smith in Feb?	=DCOUNTA(B2:F9,B2,I4:J5)		

3. Press **<Enter>**.

The result appears as shown below.

What is the total sales value for John Smith?	11300		
What is the average sales value for John Smith?	3766.666667		
What is the highest sales value for John Smith in Feb?	4500		
How many records for John Smith in Feb?	2		

CREATING A POWERFUL DATABASE

Using VLOOKUP Function

You use Lookup functions to search a value in a database or list. VLOOKUP function helps you to search the **left most vertical column** for a comparative value.

Important:

You must first **sort your database list** before you use the VLOOKUP function.

Function Syntax:

=VLOOKUP(Lookup Value,Database Range,Column Index Number,Range Lookup)

Argument	Description
Lookup Value	The value the function looks for in the left most column of the Database range. It can be a value, a reference or a text string.
Database Range	The range of cells where the details of the records are located. You can use a cell reference or a range name for this argument.
Column Index Number	The column number in the database range, which contains the details you want to retrieve. For example, use 2 if you want to retrieve the details from the second column of a database range.
Range Lookup	Logical value to indicate whether the exact or the closest match is retrieved. to find the closest match in the left most column (sorted in ascending order) of the database range, use TRUE or omitted. to find the exact match, use FALSE instead.

CREATING A POWERFUL DATABASE

The following example shows how the product description, stock available and unit price details in the product catalog is retrieved and shown in the table below if you enter the Product ID in cell C8

If you type **A2** in the cell **C8**, the Product Description: **Wooden Chair** automatically appears in cell **C9**, which contains the **VLOOKUP()** function.

	Column Index Number = 1	Column Index Number = 2	Column Index Number = 3	Column Index Number = 4	Column Index Number = 5
1	Product Catalog				
2	ProductID	Product Description	Supplier	Unit Price	Stock Available
3	A1	Wooden Table	IKEA	\$ 520.00	3000
4	A2	Wooden Chair	MAYOR	\$ 340.00	5400
5	A3	Metal Table	IKEA	\$ 630.00	1400
6	A4	Metal Chair	NOBLE	\$ 270.00	6000
7					
8	Enter the Product ID		A2		
9	Product Description		Wooden Chair		
10	Stock Available		5400		
11	Unit Price		\$ 340.00		

Database Range: A3:A6 (rows 3 to 6, columns 1 to 5)

Lookup Value: A2 (cell C8)

VLOOKUP() function will retrieve product description from the database range using the Lookup value ProductID A2.

If there is no value in the Lookup value cell (C8), **#N/A** appears as shown below.

	A	B	C	D	E
1	Product Catalog				
2	ProductID	Product Description	Supplier	Unit Price	Stock Available
3	A1	Wooden Table	IKEA	\$ 520.00	3000
4	A2	Wooden Chair	MAYOR	\$ 340.00	5400
5	A3	Metal Table	IKEA	\$ 630.00	1400
6	A4	Metal Chair	NOBLE	\$ 270.00	6000
7					
8	Enter the Product ID				
9	Product Description		#N/A		
10	Stock Available		#N/A		
11	Unit Price		#N/A		

Before you begin, create the following tables on a new worksheet.

	A	B	C	D	E
1	Product Catalog				
2	ProductID	Product Description	Supplier	Unit Price	Stock Available
3	A1	Wooden Table	IKEA	\$ 520.00	3000
4	A2	Wooden Chair	MAYOR	\$ 340.00	5400
5	A3	Metal Table	IKEA	\$ 630.00	1400
6	A4	Metal Chair	NOBLE	\$ 270.00	6000
7					
8	Enter the Product ID				
9	Product Description				
10	Stock Available				
11	Unit Price				

CREATING A POWERFUL DATABASE

How to Use VLOOKUP to Find Data

SUMMARY

1. Click the cell where you want to place the formula.
2. Enter the function **=VLOOKUP()** and specify its arguments.
3. Press **<Enter>**.

1. Click the **cell C9**.

This is where you want to show the product description if the product ID is provided in cell C8.

	A	B	C	D	E
1	Product Catalog				
2	ProductID	Product Description	Supplier	Unit Price	Stock Available
3	A1	Wooden Table	IKEA	\$ 520.00	3000
4	A2	Wooden Chair	MAYOR	\$ 340.00	5400
5	A3	Metal Table	IKEA	\$ 630.00	1400
6	A4	Metal Chair	NOBLE	\$ 270.00	6000
7					
8	Enter the Product ID				
9	Product Description				
10	Stock Available				
11	Unit Price				

2. Enter the formula **=VLOOKUP(C8,A3:E6,2)**.

Cell C8 stores the lookup value. Number 2 indicates the product description is located in the second column of the database. Note: When selecting the database range, exclude the field name cells.

Enter the Product ID	
Product Description	=VLOOKUP(C8,A3:E6,2)
Stock Available	
Unit Price	

3. Press **<Enter>**.

The result appears as #N/A because the lookup value Product ID in cell C8 does not contain any value.

Enter the Product ID	
Product Description	#N/A
Stock Available	
Unit Price	

CREATING A POWERFUL DATABASE

4. In the cell C8, type the lookup value A2.

This is to find the details for the record with the Product ID A2. the lookup value is not case sensitive, which means A2 or a2 will get the same result.

Enter the Product ID	A2
Product Description	#N/A
Stock Available	
Unit Price	

5. Press <Enter>.

The product description for Product ID A2 is found and is displayed in the cell C9.

Enter the Product ID	A2
Product Description	Wooden Chair
Stock Available	
Unit Price	

**6. In the cell C10, enter the formula
=VLOOKUP(C8,A3:E6,5) to find the stock available.**

Number 5 indicates the Stock Available information is located in the fifth column of the database.

**7. In the cell C11, enter the formula
=VLOOKUP(C8,A3:E6,4) to find the unit price.**

Number 4 indicates the Unit Price is located in the forth column of the database. If you apply currency style to cell C11, the result appears as shown below.

Enter the Product ID	A2
Product Description	Wooden Chair
Stock Available	5400
Unit Price	\$ 340.00

CREATING A POWERFUL DATABASE

How to Limit the Lookup Value For Exact Match

SUMMARY

1. Click the cell where you want to place the formula.
2. Enter the **VLOOKUP()** function and specify its arguments. Make sure you type in **FALSE** for the Range Lookup argument.
3. Press **<Enter>**.

1. In the cell C8, type A5. Press <Enter>.

You want to find details for Product ID A5. Since the Product ID A5 does not exist, you will see that the last record details are displayed. By default, Excel will take the closest match record if the record is not found in the database.

	A	B	C	D	E
1	Product Catalog				
2	ProductID	Product Description	Supplier	Unit Price	Stock Available
3	A1	Wooden Table	IKEA	\$ 520.00	3000
4	A2	Wooden Chair	MAYOR	\$ 340.00	5400
5	A3	Metal Table	IKEA	\$ 630.00	1400
6	A4	Metal Chair	NOBLE	\$ 270.00	6000
7					
8	Enter the Product ID		A5		
9	Product Description		Metal Chair		
10	Stock Available		6000		
11	Unit Price		\$ 270.00		

2. Edit the old formula in the cell C8 from

=VLOOKUP(C8,A3:E6,2) to

=VLOOKUP(C8,A3:E6,2,FALSE).

The Range Lookup argument is set to FALSE to find an exact match of the lookup value. the Range Lookup argument is by default set to TRUE if it is omitted.

Enter the Product ID		A5		
Product Description		=VLOOKUP(C8,A3:E6,2,FALSE)		
Stock Available		6000		
Unit Price		\$ 270.00		

3. Press <Enter>.

The result appears as #N/A because the lookup value A5 does not match any Product ID in the database. You should edit the formulas in the cell C10 and C11 as well.

Enter the Product ID		A5		
Product Description		#N/A		
Stock Available		6000		
Unit Price		\$ 270.00		

CREATING A POWERFUL DATABASE

How to Use the Closest Match For the Lookup Value

SUMMARY

1. Click the cell where you want to insert the formula.
2. Enter the **=VLOOKUP()** function and specify its arguments.
3. Press **<Enter>**.

TIPS

- If you want to copy the formula down using AutoFill for Mary and Steve, you have to make the database range absolute reference. the formula in the cell F2 should be edited to **=VLOOKUP(E2,\$A\$2:\$B\$6,2)** before you copy the formula.
- Another alternative is to define a range name for the database range and use the database range name in the formula.

Before you begin, create the following tables on a new worksheet.

1. Click the **cell F2** to find the grade for the student.

You want to find the grade for the student. Here, you want to find the closest match of the records instead of an exact match.

	A	B	C	D	E	F
1	Result	Grade		Student	Result	Grade
2	0	E		John	38	
3	40	D		Mary	94	
4	60	C		Steve	72	
5	80	B				
6	90	A				

2. In the cell **F2**, type the formula **=VLOOKUP(E2,A2:B6,2)**.

The Range Lookup argument is by default set to TRUE if it is omitted.

	A	B	C	D	E	F	G	H
1	Result	Grade		Student	Result	Grade		
2	0	E		John	38	=VLOOKUP(E2,A2:B6,2)		
3	40	D		Mary	94			
4	60	C		Steve	72			
5	80	B						
6	90	A						

3. Press **<Enter>**.

The result appears as shown below. Use AutoFill to copy the formula to the cell F3 and F4.


	A	B	C	D	E	F
1	Result	Grade		Student	Result	Grade
2	0	E		John	38	E
3	40	D		Mary	94	
4	60	C		Steve	72	
5	80	B				
6	90	A				



Creating PivotTable And Analyzing Data

Objectives:

When you have completed these lessons, you will be able to:

- ☐ Create a PivotTable
 - ☐ Create a PivotTable from an Access database
 - ☐ Update information in PivotTable
 - ☐ Add information in PivotTable
 - ☐ Arrange information in PivotTable
 - ☐ Remove information in PivotTable
 - ☐ Create page in PivotTable
 - ☐ Display pages on separate sheets
 - ☐ Use other Functions in calculated fields
 - ☐ Insert calculated fields
 - ☐ Hide calculated fields
 - ☐ Delete calculated fields
 - ☐ Create Chart from PivotTable
 - ☐ Create one variable What-If table
 - ☐ Create two variable What-If table
 - ☐ Create and apply scenarios
 - ☐ Edit and delete scenarios
 - ☐ Use goal seek
 - ☐ Use solver
- 

WORKING WITH THE WEB

Creating PivotTable

Databases or data lists consist of many fields and records. These records are considered as a raw data. to convert the data into useful information, you need to organize the list and summarize specific details while excluding the irrelevant. At times, you may have several similar Microsoft Excel lists, which need to be consolidated to produce a single report. in that case, PivotTable report could be used to accomplish the tasks.

	A	B	C	D	E
1	Invoice	Month	Sales Person	Product	Sales Value
2	A001	Feb	John Smith	Wooden Chair	4500
3	A002	Feb	Steve Brown	Wooden Desk	2300
4	A003	Feb	Mary Davis	Metal Chair	3300
5	A004	Feb	John Smith	Wooden Chair	3700
6	A005	Feb	Mary Davis	Wooden Desk	5400
7	A006	Mar	John Smith	Metal Chair	3100
8	A007	Mar	John Cage	Wooden Desk	5200

This is a raw data in a database that need to be summarized in order to produce an informative report.



PivotTable helps to convert the raw data into a useful report.

Page Details

You can select the page details to filter PivotTable records.

Column Details

Show field details in column headings.

Month	Feb				
Sum of Sales Value	Product				
Sales Person	Metal Chair	Wooden Chair	Wooden Desk	Grand Total	
John Smith		8500		8500	
Mary Davis	3300		5300	8600	
Steve Brown			2300	2300	
Grand Total	3300	8500	7600	19400	

Row Details

Show field details in row headings.

Data Details

Show calculated field details.

How to Create a PivotTable

SUMMARY

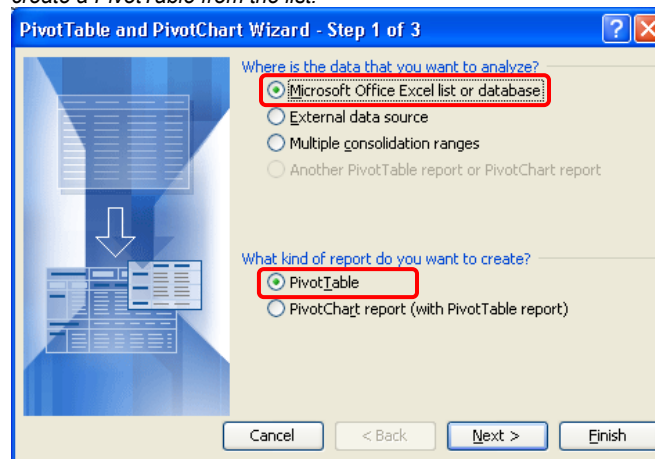
1. Click any cell in the database.
2. Click **Data >> PivotTable and PivotChart Report**.
3. Click the **Next** button.
4. Select the database range you want to analyze.
5. Click the **Next** button.
6. Click the **Layout** button.
7. Drag fields into **Column**, **Row**, **Data** and **Page** area.
8. Click the **OK** button.
9. Click the **Finish** button.

Before you begin, create a new worksheet and enter the database list, as shown below. You can also copy the database list that you have created in previous lesson and paste it on the cell A1 in this new worksheet.

	A	B	C	D	E
1	Invoice	Month	Sales Person	Product	Sales Value
2	A001	Feb	John Smith	Wooden Chair	4500
3	A002	Feb	Steve Brown	Wooden Desk	2300
4	A003	Feb	Mary Davis	Metal Chair	3300
5	A004	Feb	John Smith	Wooden Chair	3700
6	A005	Feb	Mary Davis	Wooden Desk	5400
7	A006	Mar	John Smith	Metal Chair	3100
8	A007	Mar	John Cage	Wooden Desk	5200


1. Click any cell in the database. From the menu, click **Data >> PivotTable and PivotChart Report**.

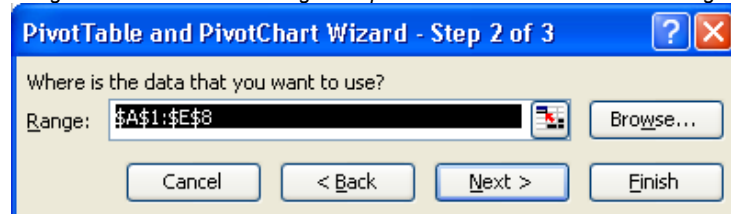
The *PivotTable and PivotChart Wizard – Step 1 of 3* dialog box appears. Excel automatically assumes that you want to analyze a Microsoft Office Excel list and create a PivotTable from the list.



2. Click the **Next** button.

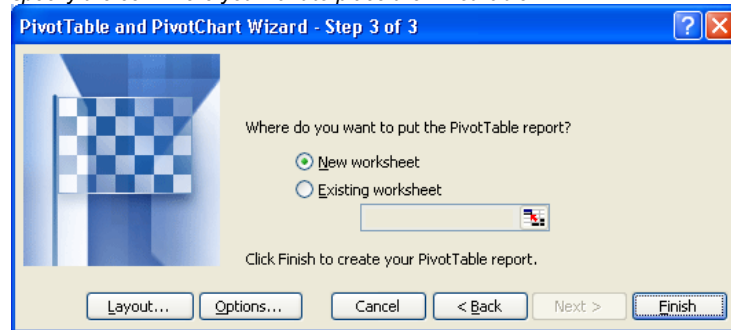
You can see that the list range automatically appears in the Range box.

However if you decide to change the database range, click  on the right of the Range box to select a new range and press <Enter> to return to this dialog box.



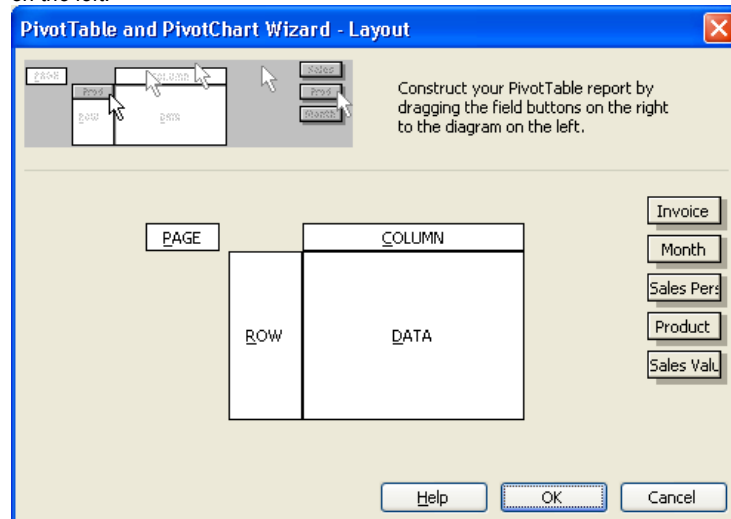
3. Click the Next button.

The step 3 of 3 dialog box appears. By default, the PivotTable is going to be created in a new worksheet. If you want the PivotTable report to be placed on the same worksheet, select the existing worksheet option button and then specify the cell where you want to place the PivotTable.



4. Click the Layout button.

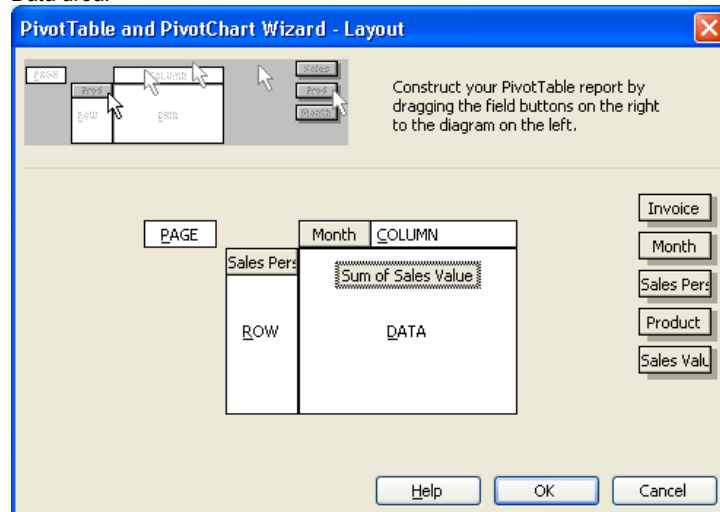
The PivotTable and PivotChart Wizard – Layout dialog box appears. You can see all the fields appear as buttons on the right and a PivotTable layout appears on the left.



Area	Description
Column	Displays data in the field as column labels.
Row	Displays data in the field as row labels.
Data	Displays calculated values from the selected field.
Page	Filters records you want to shown in the PivotTable.

5. Drag the **Month** button into the **Column** area, the **Sales Person** button into the **Row** area and the **Sales Value** button into the **Data** area.

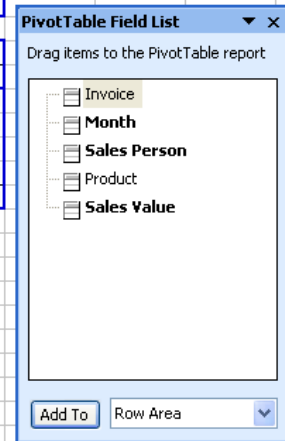
*Sales Value button changes to **Sum of Sales Value** when you drag it into the Data area.*



6. Click the **OK** button and click the **Finish** button.

The PivotTable is created on a new worksheet. You can see that the PivotTable toolbar and PivotTable Field List appear as shown below.

	A	B	C	D	E	F	G
1	Drop Page Fields Here						
2							
3	Sum of Sales Value	Month					
4	Sales Person	Feb	Mar	Grand Total			
5	John Cage		5200	5200			
6	John Smith	8200	3100	11300			
7	Mary Davis	8700		8700			
8	Steve Brown	2300		2300			
9	Grand Total	19200	8300	27500			
10							
11	PivotTable						
12	PivotTable						
13							
14							
15							
16							
17							
18							
19							



How to Create a PivotTable From An Access Database

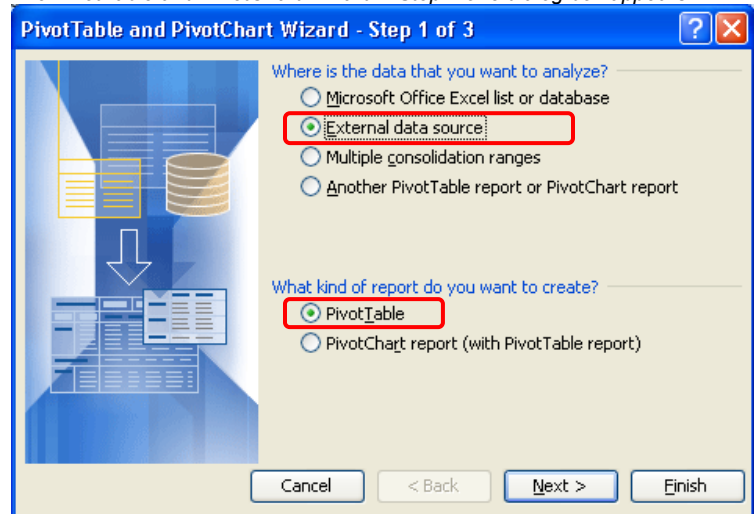
SUMMARY

1. Click **Data >> PivotTable and PivotChart Report**.
2. Click **External data source** option.
3. Click the **Next** button.
4. Click the **Get Data** button.
5. Click **MS Access database**. Then click the **OK** button.
6. Select the database file you want.
7. Click the **OK** button. Then select the table you want and click **>** to define your query.
8. Click the **Next** button until you see the **Finish** button and click the **Finish** button.
9. Click the **Next** button and then click the **Finish** button.

Before you begin, make sure you have an Access database ready in your computer. Here, we will use the sample database: **Northwind.mdb**, which comes together with Microsoft Access application.

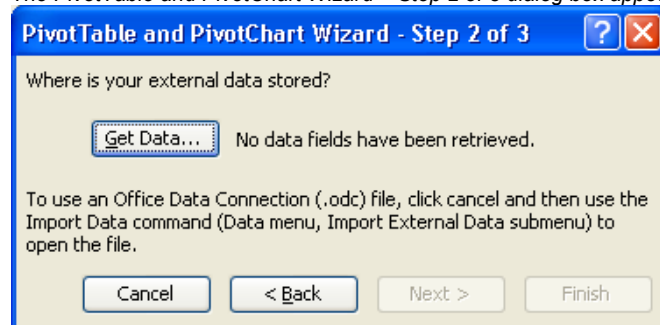
1. From the menu, click **Data >> PivotTable and PivotChart Report**.

The PivotTable and PivotChart Wizard – Step 1 of 3 dialog box appears.



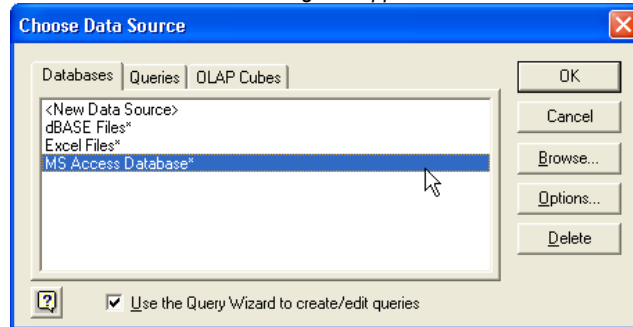
2. Click **External data source** option. Click the **Next** button.

The PivotTable and PivotChart Wizard – Step 2 of 3 dialog box appears.



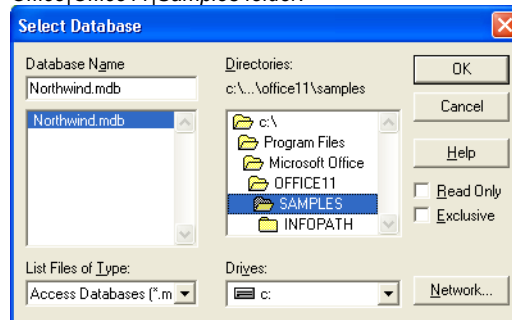
3. Click the Get Data button.

The Choose Data Source dialog box appears.



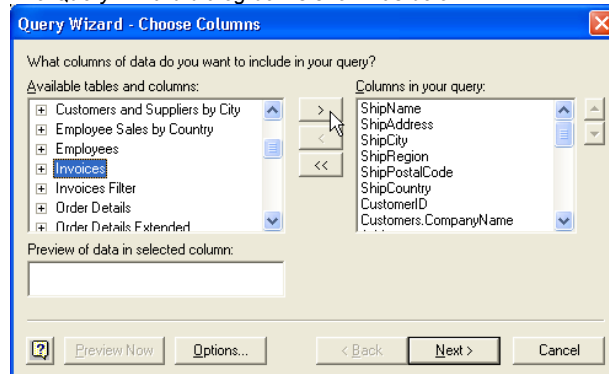
4. Click MS Access Database from the list. Then click the OK button. Select the Northwind.mdb database from your computer.

The Northwind.mdb is by default stored in C:\Program Files\Microsoft Office\Office11\Samples folder.



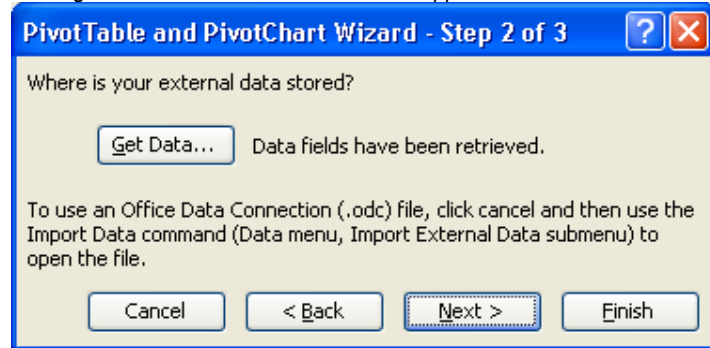
5. Click the OK button. Click to select the tables and columns you want. Then click > to define the columns in your query.

The Query Wizard dialog box is shown as below.



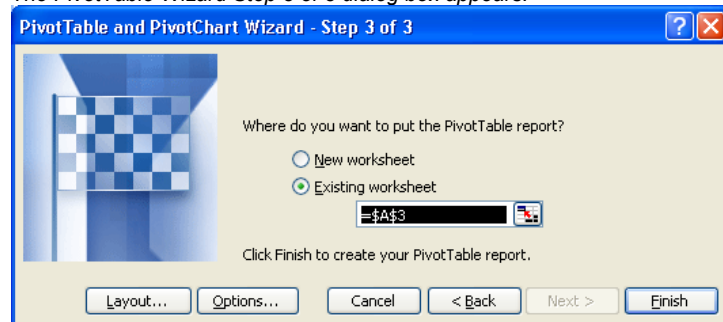
6. Keep clicking the **Next** button until you see the Finish button. Click the **Finish** button.

Excel returns to the PivotTable wizard – step 2 of 3. You can see that the message 'Data fields have been retrieved.' appears next to the Get Data button.



7. Click the **Next** button.

The PivotTable Wizard Step 3 of 3 dialog box appears.



8. Click the **Finish** button to create the PivotTable.


You can also click the Layout button to design the layout for the PivotTable. Refer to the previous lesson if you want to design the layout for the PivotTable.

Updating PivotTable

PivotTable will not be updated automatically when you edit the source database. You have to manually update the PivotTable.

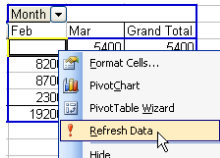
How to Update Information in PivotTable

SUMMARY

1. Edit the source database.
2. Click the **PivotTable**.
3. Click .

TIPS

- You can also right-click at the PivotTable, then click **Refresh Data** from the shortcut menu.



1. In the **cell E8**, type **5400** to replace **5200**.

You are updating the database record. Look at the PivotTable. You will see that the information is not updated automatically in the PivotTable.

	A	B	C	D	E
1	Invoice	Month	Sales Person	Product	Sales Value
2	A001	Feb	John Smith	Wooden Chair	4500
3	A002	Feb	Steve Brown	Wooden Desk	2300
4	A003	Feb	Mary Davis	Metal Chair	3300
5	A004	Feb	John Smith	Wooden Chair	3700
6	A005	Feb	Mary Davis	Wooden Desk	5400
7	A006	Mar	John Smith	Metal Chair	3100
8	A007	Mar	John Cage	Wooden Desk	5400

2. Click the PivotTable.

The PivotTable toolbar is activated.



3. Click **Refresh Data** button to refresh data.

The total for John Cage in Mar is updated from 5200 to 5400.

Sum of Sales Value	Month		
Sales Person	Feb	Mar	Grand Total
John Cage		5200	5200
John Smith	8200	3100	11300
Mary Davis	8700		8700
Steve Brown	2300		2300
Grand Total	19200	8300	27500

Sum of Sales Value	Month		
Sales Person	Feb	Mar	Grand Total
John Cage		5400	5400
John Smith	8200	3100	11300
Mary Davis	8700		8700
Steve Brown	2300		2300
Grand Total	19200	8500	27700



WORKING WITH THE WEB

How to Add Information in a PivotTable

SUMMARY

1. Click the PivotTable.
2. Drag and drop the field button from the PivotTable Field List to the PivotTable area where you want to add the information.

1. Click the PivotTable.

The PivotTable toolbar appears.

2. Drag and drop the **Product** field button from the PivotTable Field List to the **Column** area in PivotTable.

Drop the field below the month details. Make sure a thick shaded line appears below the cell B4:D4, which is where you want to add the information.

Sum of Sales Value	Month		
Sales Person	Feb	Mar	Grand Total
John Cage		5400	5400
John Smith	8200	3100	11300
Mary Davis	8700		8700
Steve Brown	2300		2300
Grand Total	19200	8500	27700

PivotTable Field List

Drag items to the PivotTable report

- Invoice
- Month
- Sales Person
- Product
- Sales Value

Add To: Column Area

3. Release the mouse.

The information is added into the PivotTable as shown below.

Sum of Sales Value	Month	Product			
	Feb			Feb Total	Mar
Sales Person	Metal Chair	Wooden Chair	Wooden Desk		Metal Chair
John Cage					
John Smith		8200		8200	3100
Mary Davis	3300		5400	8700	
Steve Brown			2300	2300	
Grand Total	3300	8200	7700	19200	3100

WORKING WITH THE WEB

How to Arrange Information in PivotTable

SUMMARY

1. Click the PivotTable.
2. Drag and drop the field button from column area to row area or vice versa.

1. Drag and drop the **Month** field button from PivotTable **Column area** onto the **Row area** in the PivotTable.

Drop the field button below the month details. Make sure a thick shaded line appears at the right of cell A5:A10, which is where you want to place the information.

Sum of Sales Value	Month	Product	
	Feb		Feb Total
Sales Person	Metal Chair	Wooden Chair	Wooden Desk
John Cage			
John Smith		8200	8200
Mary Davis	3300		5400
Steve Brown			2300
Grand Total	3300	8200	7700

2. Release the mouse.

The information is arranged into the PivotTable as shown below.

Sum of Sales Value	Month	Product	
Sales Person	Month	Metal Chair	Wooden Chair
John Cage	Mar		5400
John Cage Total			5400
John Smith	Feb		8200
	Mar	3100	3100
John Smith Total		3100	8200
Mary Davis	Feb		5400
Mary Davis Total		3300	5400
Steve Brown	Feb		2300
Steve Brown Total			2300
Grand Total		6400	8200

How to Remove Information in a PivotTable

SUMMARY

1. Click the PivotTable.
2. Drag the field button for the field you want to delete away from the PivotTable.

1. Drag and drop the **Month** field button in PivotTable away from the PivotTable.

You can see that the pointer changes to a Remove Field pointer.

Sum of Sales Value		Product			
Sales Person	Month	Metal Chair	Wooden Chair	Wooden Desk	Grand Total
John Cage	Mar			5400	5400
John Cage Total				5400	5400
John Smith	Feb		8200		8200
	Mar	3100			3100
John Smith Total		3100	8200		11300
Mary Davis	Feb	3300		5400	8700
Mary Davis Total		3300		5400	8700
Steve Brown	Feb			2300	2300
Steve Brown Total				2300	2300
Grand Total		6400	8200	13100	27700

2. Release the mouse.

The Month field is removed from the PivotTable as shown below.

Sum of Sales Value		Product			
Sales Person		Metal Chair	Wooden Chair	Wooden Desk	Grand Total
John Cage				5400	5400
John Smith		3100	8200		11300
Mary Davis		3300		5400	8700
Steve Brown				2300	2300
Grand Total		6400	8200	13100	27700

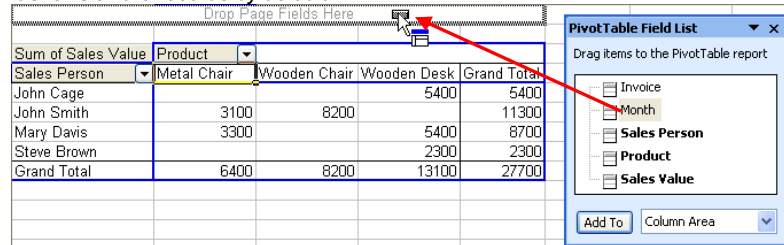
How to Create Page in PivotTable

SUMMARY

1. Click the PivotTable.
2. Drag and drop the field button from the PivotTable Field List to the **Page** area in the PivotTable.

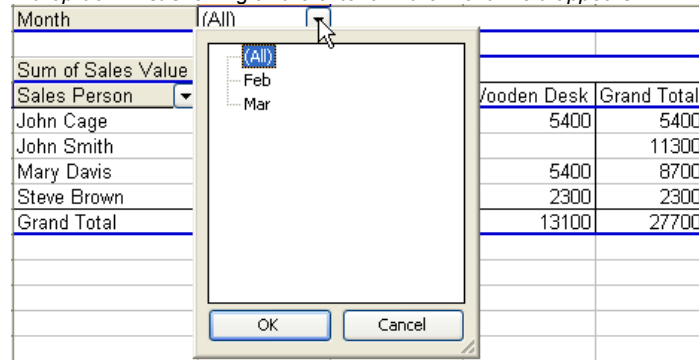
1. Drag and drop the **Month** field from PivotTable Field List onto the **Page** area in the PivotTable.

The page area will hold the month field button for you to filter records by month. It shows all the records by default.



2. In the **Page** area, click the **Month** drop-down arrow.

A drop-down list showing all the criteria in the month field appears.



3. Click **Feb** from the list. Click the **OK** button.

The records are filtered to show only Feb records, as shown below.

Month	Feb				
Sum of Sales Value	Product				
Sales Person	Metal Chair	Wooden Chair	Wooden Desk	Grand Total	
John Smith		8200		8200	
Mary Davis	3300		5400	8700	
Steve Brown			2300	2300	
Grand Total	3300	8200	7700	19200	

4. Repeat step 2 and 3 to show all the records.

The table shows all the records, as shown below.

Month	(All)				
Sum of Sales Value	Product				
Sales Person	Metal Chair	Wooden Chair	Wooden Desk	Grand Total	
John Cage			5400	5400	
John Smith	3100	8200		11300	
Mary Davis	3300		5400	8700	
Steve Brown			2300	2300	
Grand Total	6400	8200	13100	27700	

How to Display Pages On Separate Sheets

SUMMARY

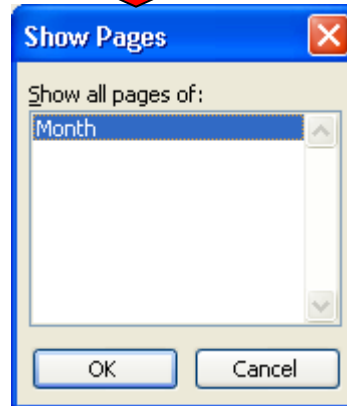
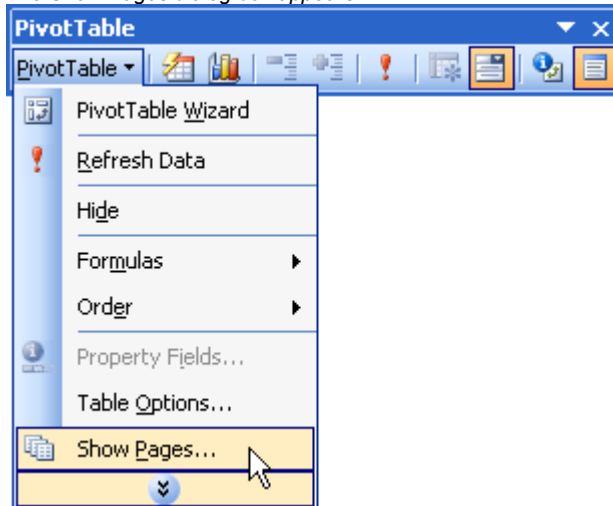
1. Click the PivotTable.
2. On the PivotTable toolbar, click **PivotTable >> Show Pages**.
3. In the **Show all pages of** box, click to select the field you want.
4. Click the **OK** button.

TIPS

- If you want to remove the sheets, you have to delete each sheet manually. Right-click the sheet tab, click **Delete** from the shortcut menu. Then, click the **Delete** button to confirm the deletion.

1. Click the PivotTable. On the PivotTable toolbar, click **PivotTable >> Show Pages**.

The Show Pages dialog box appears.



2. In the **Show all pages of** box, click **Month**. Then, click the **OK** button.

All the pages are created on separate sheets. the Feb sheet contains Feb records and the Mar sheet contains Mar records. All the records are copied onto separate sheets in the workbook. the sheets are named after the page field information.



Modifying Calculated Field in PivotTable

Besides using the Sum function to find the total for the number fields, you are able to use other functions such as Average, Maximum, and Minimum etc.

How to Change Function For a Calculated Field

SUMMARY

1. Double-click the calculated field in the PivotTable.
2. In the **Summarize by** box, click the function you want.
3. Click the **OK** button.

1. Double-click **Sum of Sales Value** button in the PivotTable.

The following illustration shows you the location of the Sum of Sales Value button. If you double-click the button, the PivotTable Field dialog box appears.

Month	(All)			
Sum of Sales Value	Product			
Sales Person	Metal Chair	Wooden Chair	Wooden Desk	Grand Total
John Cage			5400	5400
John Smith	3100	8200		11300
Mary Davis	3300		5400	8700
Steve Brown			2300	2300
Grand Total	6400	8200	13100	27700

2. In the **Summarize by** box, click **Average** from the list.

The name of the field button changes to Average of Sales Value automatically.

The dialog box is titled 'PivotTable Field'. It contains the following fields and controls:

- Source field:** Sales Value
- Name:** Average of Sales Value
- Summarize by:** A list box containing 'Sum', 'Count', 'Average' (highlighted with a red rectangle), 'Max', 'Min', 'Product', and 'Count Nums'.
- Buttons:** OK, Cancel, Hide, Number..., and Options >>.

3. Click the **OK** button.

The average is calculated instead of the total.


Average of Sales Value	Product			
Sales Person	Metal Chair	Wooden Chair	Wooden Desk	Grand Total
John Cage			5400	5400
John Smith	3100	4100		3766.666667
Mary Davis	3300		5400	4350
Steve Brown			2300	2300
Grand Total	3200	4100	4366.666667	3957.142857

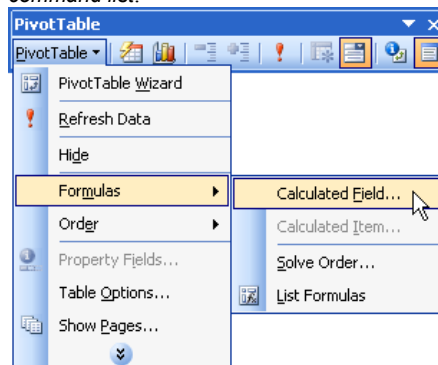
How to Insert a Calculated Field

SUMMARY

1. Click the PivotTable.
2. On the PivotTable toolbar, click **PivotTable >> Formula >> Calculated Field**.
3. In the **Name** box, type the calculated field name you want.
4. In the **Formula** box, type the formula for the calculated field.
5. Click the **Add** button.
6. Click the **OK** button.

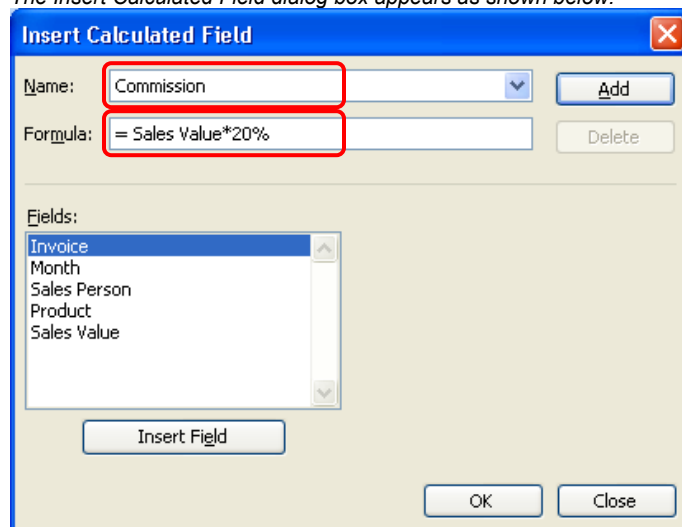
1. Click any cell in the PivotTable. From the PivotTable toolbar, click the **PivotTable >> Formulas >> Calculated Field**.

If you do not see the Formulas command, click  at the bottom of the command list.



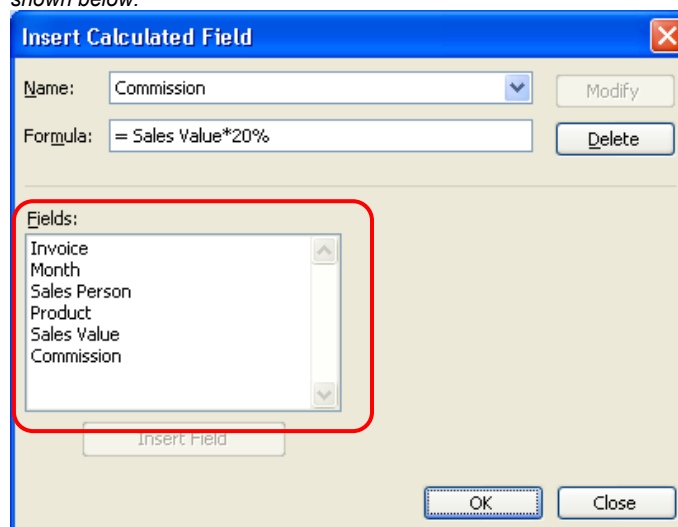
2. In the **Name** box, type **Commission**. in the **Formula** box, type **=Sales Value*20%**.

The Insert Calculated Field dialog box appears as shown below.



3. Click the Add button.

The new calculated field (Commission) is added into the Fields list box, as shown below.



4. Click the OK button.

The new calculated field is shown in the PivotTable.

		Product			
Sales Person	Data	Metal Chair	Wooden Chair	Wooden Desk	Grand Total
John Cage	Average of Sales Value			5400	5400
	Sum of Commission	0	0	1080	1080
John Smith	Average of Sales Value	3100	4100		3766.666667
	Sum of Commission	620	1640	0	2260
Mary Davis	Average of Sales Value	3300		5400	4350
	Sum of Commission	660	0	1080	1740
Steve Brown	Average of Sales Value			2300	2300
	Sum of Commission	0	0	460	460
Total Average of Sales Value		3200	4100	4366.666667	3957.142857
Total Sum of Commission		1280	1640	2620	5540

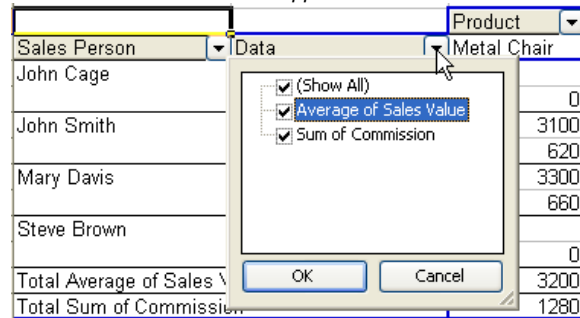
How to Hide a Calculated Field

SUMMARY

1. Click the **Data** drop-down arrow in the PivotTable.
2. Uncheck the calculated field you want to hide.
3. Click the **OK** button.

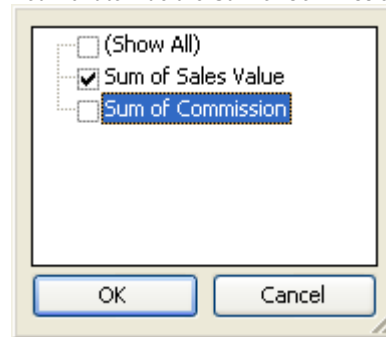
1. Click the **Data** drop-down arrow.

A list of the calculated fields appears.



2. Click to uncheck the **Sum of Commission** check box.

You want to hide the Sum of Commission.



3. Click the **OK** button.

The Sum of Commission is hidden from the PivotTable. Only the Sum of Sales Value appears in the PivotTable.

Sum of Sales Value	Product			
Sales Person	Metal Chair	Wooden Chair	Wooden Desk	Grand Total
John Cage			5400	5400
John Smith	3100	8200		11300
Mary Davis	3300		5400	8700
Steve Brown			2300	2300
Grand Total	6400	8200	13100	27700

How to Delete Calculated Fields

SUMMARY

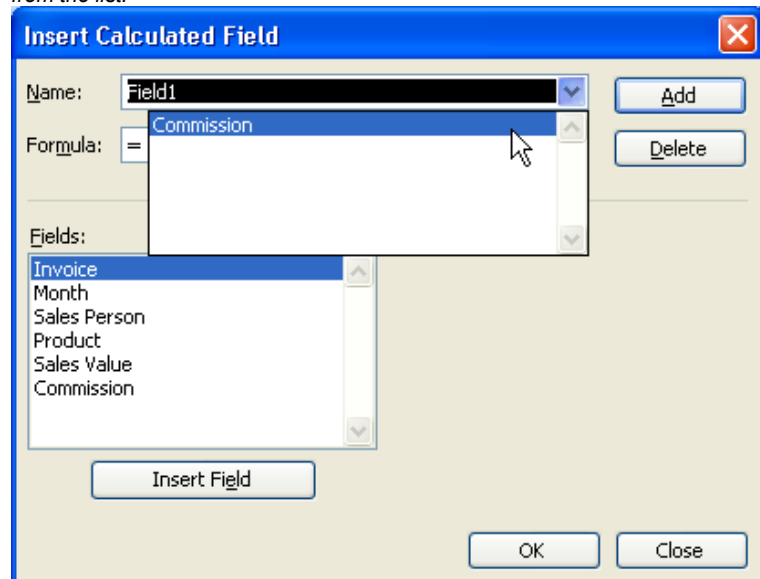
1. Click the PivotTable.
2. From the PivotTable toolbar, click **PivotTable >> Formula >> Calculated Field**.
3. Click the **Name** drop-down arrow.
4. Click to select the field you want to delete.
5. Click the **Delete** button.
6. Click the **OK** button.

1. Click any cell in the PivotTable. From the PivotTable toolbar, click **PivotTable >> Formulas >> Calculated Field**.

The Insert Calculated Field dialog box appears.

2. Click the **Name** drop-down arrow and click **Commission**.

The Add button changes to Modify button when you select the Commission field from the list.



3. Click the **Delete** button, and then click the **OK** button.


The Commission field is deleted.

Creating Chart From PivotTable

You can create the Pivot Chart from the menu or create the chart directly from the existing PivotTable.


How to Create Chart From PivotTable

SUMMARY

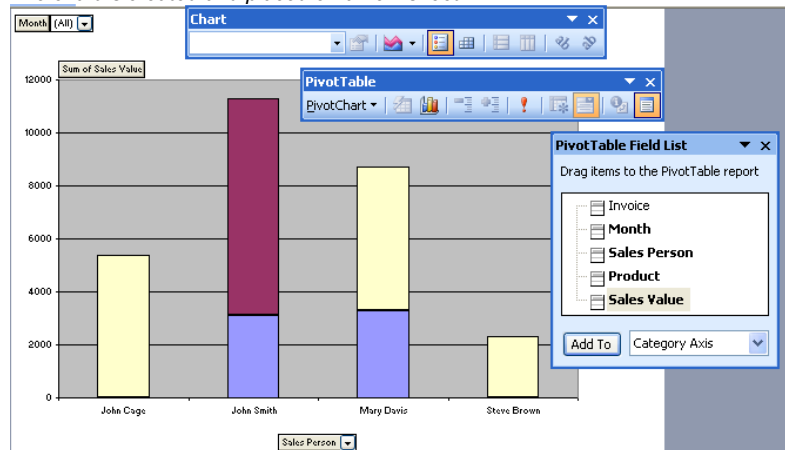
1. Click the PivotTable.
2. Click  on the PivotTable toolbar.
3. Click the title button and check or uncheck to show or hide the information you want.
4. Click the **OK** button.

TIPS

- If you want to create the chart from the database list instead of the PivotTable, click the database list and from the menu, click **Data >> PivotTable and PivotChart Report**. Click the **PivotChart** option button from the dialog box.

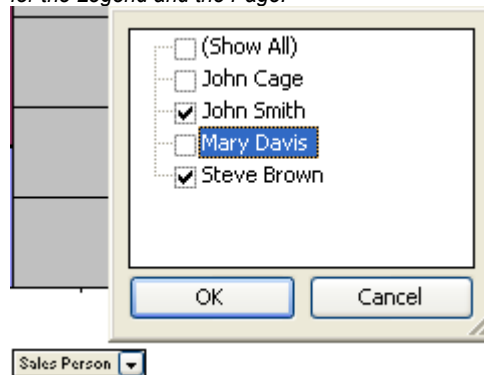
1. Click any cell in the PivotTable. Click  **Chart** button on the PivotTable toolbar.

The chart is created and placed on a new sheet.



2. Click the **Sales Person** title button on the x-axis. Then click to specify which sales person you want to show in the chart.

Uncheck the boxes to hide the sales person. You can also hide the information for the Legend and the Page.



3. Click the **OK** button.

The chart shows only John Smith and Steve Brown records.