

1. Managing Information in Lists

Spreadsheets are great for making lists (such as phone lists, client lists). In fact, years ago, Microsoft began asking people. The researchers discovered that not only was list management the number one spreadsheet activity, but also that a lot of users did nothing but create and maintain lists of various sorts.

1.1 Building and Maintaining a List

To function effectively, a list should have the following characteristics:

- The top row should consist of labels, with each label describing the contents of the column beneath it. Each label should be unique.
- Each column should contain the same kind of information.
- Each type of information that you want to be able to sort by, search on, or otherwise manipulate individually should be in a separate column.
- The list should not contain blank rows or columns.
- Ideally, the list should occupy a worksheet by itself. If that's not possible, separate the list from any other information on the worksheet by at least one blank row and column.

The figure below shows an example of a seven-column list. Each column in this list records a particular kind of information. The top row holds unique field labels. We've separated first and last names in case we want to extract last names only or use the first and last names separately in a mail-merge process. The list has no blank rows or columns and occupies a worksheet by itself.

	A	B	C	D	E	F	G	H	I	J
1	Last Name	First Name	Zip Code	Phone Number	Date of Birth	Dept.	Salary	Age		
2	Berry	Jo	02134	(800) 555-1212	1/7/66	D	76000	37		
3	Weinerman	Christian	90803	(213) 555-1212	10/13/78	B	82000	24		
4	O'Hara	Robert	14886	(312) 555-1212	2/6/55	C	26000	48		
5	Hartwig	Doris	90004	(303) 555-1212	2/19/78	E	74000	25		
6	LaMee	Brian	91106	(812) 555-1212	11/26/49	C	94000	53		
7	Penuchot	Lionel	17325	(617) 555-1212	2/17/66	D	53000	37		
8	Corets	Eva	47401	(800) 555-1212	12/31/74	D	79000	28		
9	Abercrombie	Kim	20015	(213) 555-1212	10/16/62	D	91000	40		
10	Wood	John	45401	(312) 555-1212	3/5/68	D	39000	35		
11	Hite	Douglas	80246	(303) 555-1212	5/27/66	D	41000	47		
12	Tippett	John	80226	(812) 555-1212	4/23/59	D	67000	44		
13	Lyon	Robert	84512	(617) 555-1212	6/17/53	B	43000	50		
14	Wheeler	Wendy	80123	(800) 555-1212	9/10/57	A	46000	45		
15	Shea	Lori	85255	(213) 555-1212	10/11/55	A	58000	47		
16	Hanson	Mark	46151	(312) 555-1212	4/28/65	E	57000	38		
17	Petculescu	Cristian	95404	(303) 555-1212	10/4/59	E	77000	43		
18	Simon	Britta	06070	(812) 555-1212	8/28/55	A	91000	47		
19	Mikovsky	Jan	80523	(617) 555-1212	10/22/71	B	94000	31		
20	Coleman	Pat	20510	(800) 555-1212	7/24/78	B	81000	24		
21	Philips	Carol	97007	(213) 555-1212	3/7/64	B	97000	39		
22	Yong	Joe	80234	(312) 555-1212	11/16/77	E	41000	25		
23	Cooper	Scott	50309	(303) 555-1212	11/20/68	A	48000	36		

We've used Excel's **Freeze Panes** command to lock the top row so it remains visible as we scroll downward through the list. Excel marks the pane boundary with a rule.

You can make the top row bold to set it off visually from the rest of the list. This is helpful to whoever uses your list (including yourself), but Excel doesn't require it. Because the first and second rows in the list in the figure contain different kinds of information—columns C and D, for example, have text in the top row and dates below—Excel recognizes the top row as a header row. If you sort your list, Excel is smart enough to keep the header row in place while it rearranges the rest of the list. If you create a PivotTable Report from your list, Excel will use the labels in the top row as field names.

1.2 Using (or disabling) Other List-building Aids

Excel offers the following additional features to simplify the task of list creation:

- Automatic format and formula extension
- AutoComplete for cell values
- The Pick from List command
- Move on Enter
- Custom lists

Most users find these features to be a great convenience, but if you happen to be one who does not, you can disable or ignore them, as described later in this section.

1.2.1 Automatic Format and Formula Extension

Excel looks for patterns as you build or extend a list. If you enter a text value in a column, for example, and the text in the same column in the three preceding rows happens to be italic, Excel will make the current text italic to match. (In list objects, Excel recognizes and extends a formatting pattern more quickly than it does in ordinary lists.)

Similarly, if your list includes a column whose values are based on calculations involving other columns, Excel can find the formula pattern and replicate it as you add data. Whether or not this formula extension works depends on the types of calculations involved.

The format-extension feature breaks down under certain circumstances—usually when it collides with some other convenience feature. If you apply an AutoFormat to the existing rows of a list, for example, Excel doesn't extend the AutoFormat appropriately. Thus, if your current row has a nice thick rule at the bottom, courtesy of an Auto-Format, that thick rule will not get up and move as you append rows. If you enter dates by typing a recognized date formulation (such as 11/16/88), those dates won't assume the format of dates in previous rows. If you copy data from the Clipboard, Excel doesn't deploy the extension feature at all.

If for some reason you don't fancy having formats and formulas extended automatically, choose **Tools → Options**. On the **Edit** tab, clear the **Extend List Formats and Formulas** check box.

1.2.2 AutoComplete for Cell values

Certain columns of lists typically repeat the same information. For example, if your Region column has four possible entries—North, South, East, and West—and encompasses hundreds of rows, you could be typing those same four words an average of 100 times apiece. AutoComplete to the rescue! If Excel notices that you're starting to enter something you've entered before (in the current column), it offers to complete the job for you. With your four regions, you have to type only N, S, E, or W and then press Enter, Tab, or a cursor key to accept Excel's completion.

If AutoComplete gets in your way for any reason, you can turn it off. Choose **Tools → Options**, click the **Edit** tab, and clear **Enable AutoComplete for Cell Values**.

1.2.3 Move on Enter

By default, Excel moves the selection down one row when you terminate a cell entry by pressing **[Enter]**. If you create a new row in a list by pressing the Right Arrow or Tab key after each cell entry, and then press **[Enter]** when you get to the end of the row, your **[Enter]** key becomes like the carriage-return key on a typewriter; it takes you to the leftmost cell in the next row. Most users like this. If you don't, choose **Tools → Options**, click the **Edit** tab, and clear **Move Selection After Enter**. To use the **[Enter]** key without moving, Press **[Ctrl] + [Enter]**. Excel terminates the current entry but does not move the selection.

1.2.4 Custom Lists

Use custom lists to repeat particular sequences of entries by dragging the fill handle. If you need to create lists repeatedly that include the entries Pitcher, Catcher, First Base, and so on, in consecutive rows, you can simplify the task by creating a custom list.

2. Sorting

Excel provides numerous ways to sort worksheet ranges. You can sort by columns or rows, in ascending or descending order, and with capitalization considered or ignored. You can even define custom sorting sequences so that, for example, your company's division names always appear in a particular order, regardless of their alphabetic sequence.

2.1 Default Sort Orders

After sorting a list of Excel figures, are some of the numbers not in the order you expect? A common reason for this problem is that some numbers may be formatted and stored as text instead of as numbers. When you sort data that includes values formatted and stored as text and as numbers, Excel sorts the text values separately from the number values. For example, the sales value for Tennis is formatted as text, and there were no sales for Soccer. When you sort this data by the Sales column in ascending order, you will get the following result:

	A	B		A	B
1	Sport	Sales	1	Sport	Sales
2	Golf	5,500	2	Windsurfing	1,850
3	Safari	10,000	3	Golf	5,500
4	Soccer		4	Safari	10,000
5	Tennis	1,000	5	Tennis	1,000
6	Windsurfing	1,850	6	Soccer	

In an ascending sort, Microsoft Excel uses the following order. In a descending sort, this sort order is reversed except for blank cells, which are always placed last.

Numbers Numbers are sorted from the smallest negative number to the largest positive number.

Dates Dates are sorted from the earliest date to the latest date.

Alphanumeric sort When you sort alphanumeric text, Excel sorts left to right, character by character. For example, if a cell contains the text "A100," Excel places the cell after a cell that contains the entry "A1" and before a cell that contains the entry "A11."

Text and text that includes numbers are sorted in the following order:

0 1 2 3 4 5 6 7 8 9 (space) ! " # \$ % & () * , . / : ; ? @ [\] ^ _ ` { | } ~ + < = > A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Apostrophes (') and hyphens (-) are ignored, with one exception: If two text strings are the same except for a hyphen, the text with the hyphen is sorted last.

Logical values In logical values, FALSE is placed before TRUE.

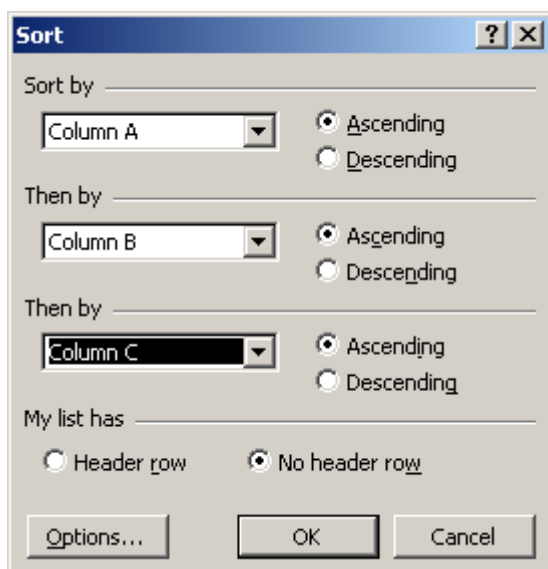
Error values All error values are equal.

Blanks Blanks are always placed last.

2.2 Sorting on Column (by Row)

You can sort on as many as three columns at once.

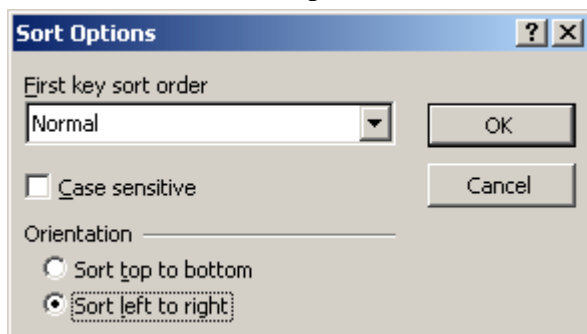
1. Select the range or table in worksheet, and then choose **Data → Sort**.
2. Select the first column on the **Sort by** section in **Sort** dialog, then select the second and third column on the **Then by** section in **Sort** dialog. You can also define the **Ascending** or **Descending** order for each column.
3. Click **[OK]** to sort the list after fill out all the boxes.



2.3 Sorting by Columns

To sort by columns, follow these steps:

1. Select the range or table in worksheet, and then choose **Data → Sort**.
2. Click **[Options]** in the **Sort** dialog box, and select the **Sort Left to Right** option. Click **[OK]** to return to the main part of the **Sort** dialog box.
3. Fill out the boxes and option buttons in the **Sort** dialog box, and click **[OK]**.



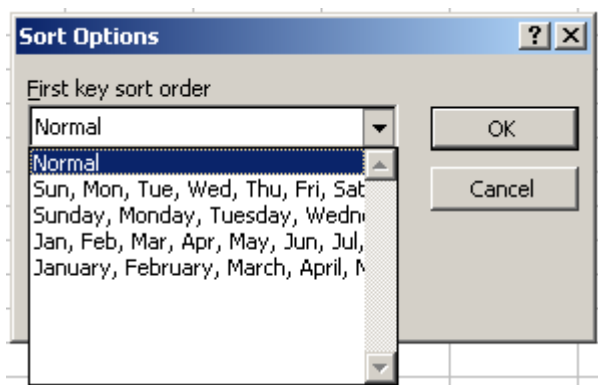
2.4 Sorting Months, Weekdays, or Custom Lists

Excel normally sorts text in alphabetical order, but it can sort on the basis of any of its custom lists if you want it to. The program includes four custom lists by default

- Sun, Mon, Tues, ...
- Sunday, Monday, Tuesday, ...
- Jan, Feb, Mar, ...
- January, February, March, ...

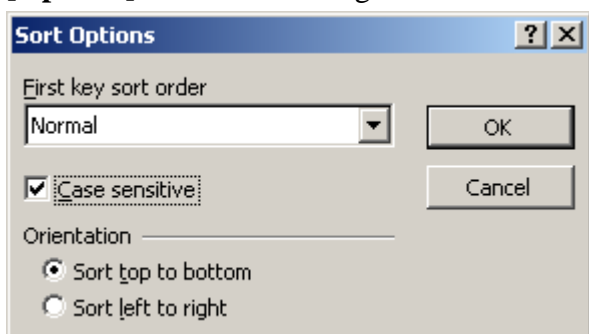
If you have a column consisting of these day or month labels, you can sort them in their proper chronological order. If you've created other custom lists, you can sort text fields in the order of those lists as well.

To sort on the basis of a custom list, click **Options** in the **Sort** dialog box, and then open the **First Key Sort Order** list. The four default custom lists will appear there, along with any others that you have created.



2.5 Performing a Case-Sensitive Sort

Normally, when Excel sorts text, it disregards case variants entirely. In other words, the program regards the letter A as exactly equivalent to the letter a. You can change this behavior by choosing **[Options]** in the **Sort** dialog box and then selecting the **Case Sensitive** check box.



2.5.1 Making Case-Sensitive Sorting the Default

Because Excel has to work a little harder to perform case-sensitive sorts, the feature is off by default. If you don't customarily sort gigantic lists, you might find that case-sensitive sorting is worth an extra few milliseconds. Sorting options are worksheet-specific, however, so you can't change Excel's default behavior by setting the option on a single worksheet (or by selecting a check box somewhere in the Options dialog box). To make case-sensitive sorting the default, do the following:

1. On each sheet of a blank workbook, enter some data into two contiguous cells (You have to do this, because Excel won't let you visit the Sort dialog box until you've selected some data that it can sort).
2. Select the data range, choose **Data → Sort**.
3. Click [**Options**], and select **Case Sensitive**. Click [**OK**] twice to carry out the sort.
4. Save the workbook as a template.

2.6 Sorting Cells that Contain Formulas

You need to exercise caution when sorting cells that contain formulas with cell references. If you sort by row, references to other cells in the same row will be correct after the sort, but references to cells in other rows of the list will no longer be correct.

Similarly, if you sort by column, references to other cells in the same columns will be correct after the sort, but references to cells in other columns will be broken. With either kind of sort, relative references to cells outside the list will be broken by the sort.

To avoid the problems associated with sorting ranges containing formulas, observe the following rules:

- In formulas that reference cells outside the sort range, use only absolute references.
- When sorting by row, avoid formulas that reference cells in other rows. If you must use such formulas, reference cells by name, not by address.
- When sorting by column, avoid formulas that reference cells in other columns. If you must use such formulas, reference cells by name, not by address.

3. Filtering

Filtering is a quick and easy way to find and work with a subset of data in a range. A filtered range displays only the rows that meet the criteria you specify for a column. Excel provides two commands for filtering ranges: AutoFilter and Advanced Filter.

Unlike sorting, filtering does not rearrange a range. Filtering temporarily hides rows you do not want displayed. When Excel filters rows, you can edit, format, chart, and print your range subset without rearranging or moving it.

3.1 Use AutoFilter for Simple Criteria and to Filter by Selection

Using AutoFilter, you can create three types of filters: by a list values, by a format, or by criteria. Each of these filter types is mutually exclusive for each range of cells or column table. For example, you can filter by cell color or by a list of numbers, but not by both; you can filter by icon or by a custom filter, but not by both.

3.1.1 Make sure the data type is the same in each column:

In your worksheet, the top row of each column should have a heading that describes the contents of the column, such as "Product Number" or "Customer". The data in each column should all be the same type. For instance, do not mix text in a column with numbers, or numbers in a column with dates.

	A	B	C
1	Customer	Region	Product Number
2	A. Datum Corp.	East	12-500

3.1.2 Activate the AutoFilter

Activate the AutoFilter by clicking **Data** → **Filter** → **AutoFilter**. The AutoFilter arrows now appear to the right of each column heading. If you select an entire column instead of a single cell before clicking the AutoFilter command, an AutoFilter arrow will appear only on the selected column, not on all columns of the data.

	A	B	C
1	Customer ▼	Region ▼	Product Number ▼

3.1.3 Start Filtering Data

Suppose your worksheet contains customer sales data. Each customer entry includes information about the customer's location, products they purchase, purchase dates, and revenues and profits from each purchase. Perhaps you want to view sales activity only for those customers located in the West region. Excel can help you do this.

To view only the sales activity from customers in the West region, you click the AutoFilter arrow ▼ in the column with the Region heading. When you click an AutoFilter arrow, a list is displayed. The list contains each of the items in the column, in alphabetical or numeric order, so that you can quickly find the item you want. In this instance, you scroll to West, and click it.

	A	B	C	D	E
1	Customer	Region	Product Number	Quantity	Revenue
2	A. Datum Corp.	Sort Ascending	12-500	500	11680
3	Adventure Works	Sort Descending	14-600	1000	24150
4	Alpine Ski House	(All)	14-600	600	13806
5	Blue Yonder Airlines	(Top 10...)	12-500	800	16935
6	Coho Winery	(Custom...)	12-100	1000	22840
7	Consolidated Messenger	Central	12-100	200	4846
8	Fabrikam, Inc.	East	14-100	300	7032
9	Graphic Design Institute	East	14-600	800	19554
10	Margie's Travel	East	14-100	800	18072
11	Southridge Videos	West	12-500	600	13962
12	World Wide Import	West	14-600	400	8556

When you click West, Excel hides all the rows on the worksheet except for those that contain that text in this column.

	A	B	C	D	E
1	Customer	Region	Product Number	Quantity	Revenue
3	Adventure Works	West	14-600	1000	24150
5	Blue Yonder Airlines	West	12-500	800	16935
6	Coho Winery	West	12-100	1000	22840
7	Consolidated Messenger	West	12-100	200	4846
10	Margie's Travel	West	14-100	800	18072
13	Tailspin Toys	West	14-100	1000	23890

3.1.4 Apply Additional Filters

If you want to focus on even more specific information, you can filter again on another column, and then again on another column, and so on. You can click the arrow next to any heading in any column to apply a filter.

For example, after filtering by Region, you can click the AutoFilter arrow on the Product Number column and filter that column to see only the West region customers who purchased product number 12-100. You can filter columns in any order you choose. The filters are applied progressively, in the order you apply them. Each filter limits the data to which you can apply the next filter.

	A	B	C	D	E
1	Customer	Region	Product Number	Quantity	Revenue
6	Coho Winery	West	12-100	1000	22840
7	Consolidated Messenger	West	12-100	200	4846

3.1.5 Turn Off Filtering

How you remove filters depends on how many filters you have applied, and from how many columns you wish to remove filters.

- To remove a filter from one column, click the AutoFilter arrow next to that column, and then click **All**. That command will display the rows hidden by that filter.
- To remove all filters at once, click **Data** → **Filter** → **Show All**. That command will display all rows hidden by all filters on the worksheet but leave AutoFilter turned on.
- To turn off AutoFilter, click **Data** → **Filter** → **AutoFilter**.

3.2 Use Advanced Filtering Techniques

Excel enables you to perform more intricate types of filtering. Two particularly useful types are:

- Top 10 Filter
- Custom Filtering.

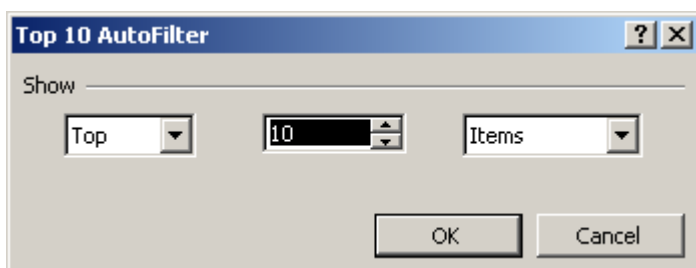
When you apply a filter to a column, the only filters available for other columns are the values visible in the currently filtered range. Only the first 1000 unique entries in a list appear when you click the arrow

3.2.1 Finding the Top 10 (or Bottom 10) in a Column


You can use the **Top 10** filter on columns of numbers or dates. With Top 10 you can find either the top items or the bottom items (the smallest or largest numbers or dates). And you're not limited to finding the top 10 items or the bottom 10 items. You can choose how many items you want to see: only 1 or as many as 500. You can use Top 10 to find the highest-priced or lowest-priced products, to identify employees with the most recent hire dates, or to see the top or bottom student grades.

To use Top 10 on a column of data, click on a data cell in the column and then click the column's AutoFilter arrow. Select (**Top 10...**) near the top of the drop down list. The **Top 10 AutoFilter** dialog box opens. In the dialog box, select either **Top** or **Bottom**. Then select a number. Finally, select either **Items** or **Percent**.


You can filter columns in any order you choose. The filters are applied progressively, in the order you apply them. Each filter limits the data to which you can apply the next filter.



3.2.1.1 Filter for the Smallest or Largest Number

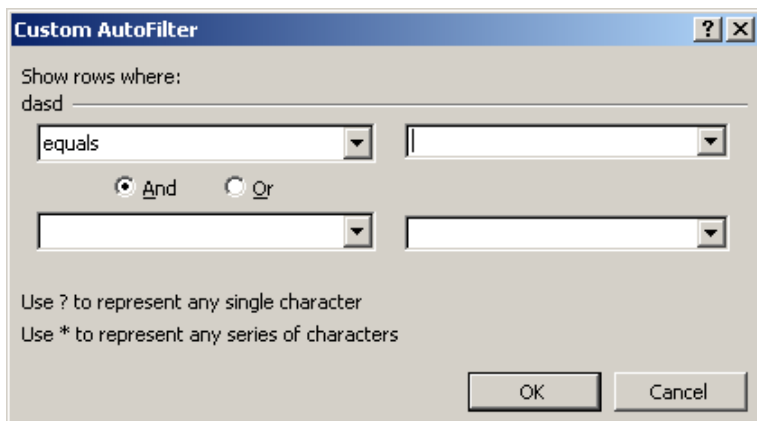
1. Click the arrow  in the column that contains the numbers, and click (**Top 10...**).
2. In the box on the left, click **Top**, or **Bottom**.
3. In the box in the middle, enter a number.
4. In the box on the right, click **Items**.

3.2.1.2 Filter for the Top or Bottom Numbers by Percent

1. Click the arrow  in the column that contains the numbers, and click (**Top 10...**).
2. In the box on the left, click **Top** or **Bottom**.
3. In the box in the middle, enter a number.
4. In the box on the right, click **Percent**.

3.2.2 Using Custom Filters

When you filter by choosing from the AutoFilter drop-down list, you hide everything except your single choice. If you want to see more than one selection in a column, you can create custom filters. To create a custom filter, click **(Custom...)** near the top of the drop down list. The **Custom AutoFilter** dialog box opens. You can now enter two filtering requirements for the column of data.



3.2.2.1 Filter a Range for Rows that Contain Specific Text

1. Click the arrow ▼ in the column that contains the numbers, and click **(Custom)**.
2. In the box on the left, click **equals**, or **does not equal**, **contains**, or **does not contain**.
3. In the box on the right, enter the text you want. If you need to find text values that share some characters but not others, use a wildcard character.
4. To add another criteria, click **And** or **Or**, and repeat the previous step.

3.2.2.2 Filter for Blank or Nonblank Cells

Click the arrow ▼ in the column that contains the numbers, then click **(Blanks)** or **(NonBlanks)**. The **Blanks** and **NonBlanks** options are available only if the column you want to filter contains a blank cell.


3.2.2.3 Filter for Numbers Greater than or Less than Another Number

1. Click the arrow ▼ in the column that contains the numbers, and click **(Custom)**.
2. In the box on the left, click **is greater than**, **is less than**, **is greater than or equal to**, or **is less than or equal to**.
3. In the box on the right, enter a number.
4. To add another criteria, click **And** or **Or**, and repeat the previous step.

3.2.2.4 Filter for a Number Equal to or Not Equal to Another Number

1. Click the arrow ▼ in the column that contains the numbers, and click **(Custom)**.
2. In the box on the left, click **equals**, or **does not equal**.
3. In the box on the right, enter a number.
4. To add another criteria, click **And** or **Or**, and repeat the previous step.

3.2.2.5 Filter for the beginning or end of a text string

1. Click the arrow  in the column that contains the numbers, and click **(Custom)**.
2. In the box on the left, click **begins with**, or **does not begin with**, or **ends with**, or **does not end with**.
3. In the box on the right, enter the text you want. If you need to find text values that share some characters but not others, use a wildcard character.
4. To add another criteria, click **And** or **Or**, and repeat the previous step.

3.3 Use Advanced Filter for more Complex Criteria

The **Data → Filter → Advanced Filter** lets you use complex criteria to filter a range, but it works differently from the AutoFilter command in several important ways.

- It displays the Advanced Filter dialog box instead of the Custom AutoFilter dialog box.
- You do not type the complex criteria in the Advanced Filter dialog box as you do in the Custom AutoFilter dialog box. Rather, you type the complex criteria in a criteria range on the worksheet and above the range you want to filter. Excel uses the separate criteria range in the Advanced Filter dialog box as the source for the complex criteria.
- Although you can filter a range in place, like the AutoFilter command, the Advanced Filter command does not display drop-down lists for the columns

In order to use the Advanced Filter

1. Insert at least three blank rows above the range that can be used as a criteria range. The criteria range must have column labels. Make sure there is at least one blank row between the criteria values and the range.
2. In the rows below the column labels, type the criteria you want to match.
3. Select the range, and then select **Data → Filter → Advanced Filter**

	A	B	C	D
1	Type	Salesperson	Sales	
2				
3				
4				
5				
6	Type	Salesperson	Sales	
7	Beverages	Suyama	\$5,122.00	
8	Meat	Davolio	\$450.00	
9	produce	Buchanan	\$6,328.00	
10	Produce	Davolio	\$6,544.00	
11				

3.3.1 Multiple Criteria in One Column

To find rows that meet multiple criteria for one column, type the criteria directly below each other in separate rows of the criteria range. *For example: In order to find either Salesperson = "Davolio" OR Salesperson = "Buchanan"*

1. Type "=Davolio" in cell B2
2. Type "= Buchanan" in cell B3
3. Select **Data** → **Filter** → **Advanced Filter**, and define the **List range** (A6:C10), the **Criteria range** (B1:B3)
4. The rows that contain either "Davolio" or "Buchanan" in the Salesperson column (A8:C10) is filtered.

The screenshot shows the 'Advanced Filter' dialog box on the left and a spreadsheet on the right. The dialog box has 'Action' set to 'Filter the list, in-place', 'List range' as '\$A\$6:\$C\$10', and 'Criteria range' as '\$B\$1:\$B\$3'. The spreadsheet shows a table with columns 'Type', 'Salesperson', and 'Sales'. Rows 8, 9, and 10 are visible, with rows 8 and 10 filtered to show 'Meat' and 'Produce' respectively.

	A	B	C	D
1	Type	Salesperson	Sales	
2		=Davolio		
3		=Buchanan		
4				
5				
6	Type	Salesperson	Sales	
8	Meat	Davolio	\$450.00	
9	produce	Buchanan	\$6,328.00	
10	Produce	Davolio	\$6,544.00	
11				

3.3.2 Multiple Criteria in Multiple Columns where All Criteria must be True

To find rows that meet multiple criteria in multiple columns, type all of the criteria in the same row of the criteria range. *For example: In order to find Type = "Produce" AND Sales > 1000*

1. Type "=Produce" in cell A2
2. Type ">1000" in cell C2
3. Select **Data** → **Filter** → **Advanced Filter**, and define the **List range** (A6:C10), the **criteria range** (A1:C2)
4. The rows that contain "Produce" in the Type column and a value greater than \$1,000 in the Sales column (A9:C10) is filtered.

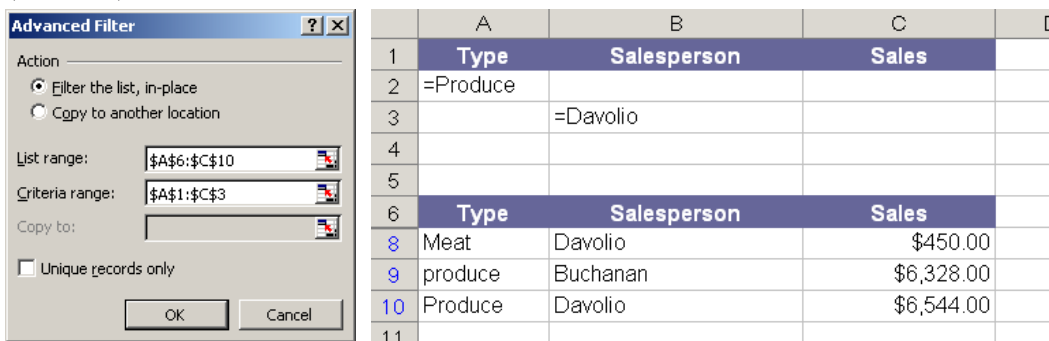
The screenshot shows the 'Advanced Filter' dialog box on the left and a spreadsheet on the right. The dialog box has 'Action' set to 'Filter the list, in-place', 'List range' as '\$A\$6:\$C\$10', and 'Criteria range' as '\$A\$1:\$C\$2'. The spreadsheet shows a table with columns 'Type', 'Salesperson', and 'Sales'. Rows 9 and 10 are visible, with row 9 filtered to show 'produce' and a sales value of \$6,328.00.

	A	B	C	D
1	Type	Salesperson	Sales	
2	=Produce		>1000	
3				
4				
5				
6	Type	Salesperson	Sales	
9	produce	Buchanan	\$6,328.00	
10	Produce	Davolio	\$6,544.00	
11				
12				

3.3.3 Multiple Criteria in Multiple Columns where Any Criteria can be True

To find rows that meet multiple criteria in multiple columns, where any criteria can be true, type the criteria in different rows of the criteria range. *For example, in order to find Type = "Produce" OR Salesperson = "Davolio"*

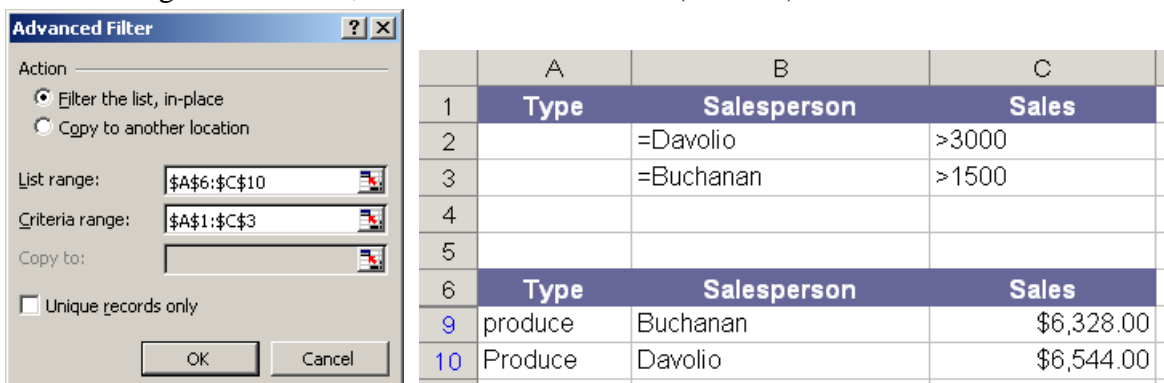
1. Type "=>Produce" in cell A2
2. Type "=>Davolio" in cell B3
3. Select **Data** → **Filter** → **Advanced Filter**, and define the **List range** (A6:C10), the **criteria range** (A1:B3)
4. The rows that contain "Produce" in the Type column or "Davolio" in the Salesperson column (A8:C10) is filtered.



3.3.4 Multiple Sets of Criteria where Each Set Includes Criteria for Multiple Columns

To find rows that meet multiple sets of criteria, where each set includes criteria for multiple columns, type each set of criteria in separate rows. *For example, in order to find (Salesperson = "Davolio" AND Sales >3000) OR (Salesperson = "Buchanan" AND Sales > 1500)*

1. Type "=>Davolio" in cell B2 and "=>>3000" in cell C2
2. Type "=>Buchanan" in cell B3 and "=>>1500" in cell C3
3. Select **Data** → **Filter** → **Advanced Filter**, and define the **List range** (A6:C10), the **criteria range** (A1:C3)
4. The rows that contain both "Davolio" in the Salesperson column and a value greater than \$3,000 in the Sales column, or displays the rows that contain "Buchanan" in the Salesperson and a value greater than \$1,500 in the Sales column (A9:C10) is filtered.



3.3.5 Multiple Sets of Criteria where Each Set Includes Criteria for One Column

To find rows that meet multiple sets of criteria, where each set includes criteria for one column, include multiple columns with the same column heading. For example, in order to find (Sales > 6000 AND Sales < 6500) OR (Sales < 500)

1. Type ">6000 " in cell C2 and "<6500" in cell D2
2. Type "<500" in cell C3
3. Select **Data** → **Filter** → **Advanced Filter**, and define the **List range** (A6:C10), the **criteria range** (A1:D3)
4. The rows that contain values between 5,000 and 8,000 and values less than 500 in the Sales column (A8:C10) is filtered.

The screenshot shows the 'Advanced Filter' dialog box with the following settings: Action: Filter the list, in-place; List range: \$A\$6:\$C\$10; Criteria range: \$A\$1:\$D\$3; Unique records only: unchecked. To the right, an Excel table is shown with columns A (Type), B (Salesperson), C (Sales), and D (Sales). Rows 2 and 3 contain criteria: '>6000' in C2, '<6500' in D2, and '<500' in C3. Rows 8 and 9 are filtered and highlighted in blue.

	A	B	C	D
1	Type	Salesperson	Sales	Sales
2			>6000	<6500
3			<500	
4				
5				
6	Type	Salesperson	Sales	
8	Meat	Davolio	\$450.00	
9	produce	Buchanan	\$6,328.00	

3.3.6 Criteria to Find Text Values that Share Some Characters but Not Others

To find text values that share some characters but not others, do one or more of the following. For example, in order to find (Type begin with "ME" or the 2nd character is "u")

1. Type "Me" in cell A2
2. Type "=?u*" in cell B3
3. Select **Data** → **Filter** → **Advanced Filter**, and define the **List range** (A6:C10), the **criteria range** (A1:C3)
4. The rows with "Me" as the first characters in the Type column or rows with the second character equal to "u" in the Salesperson column (A7:C9) is filtered.

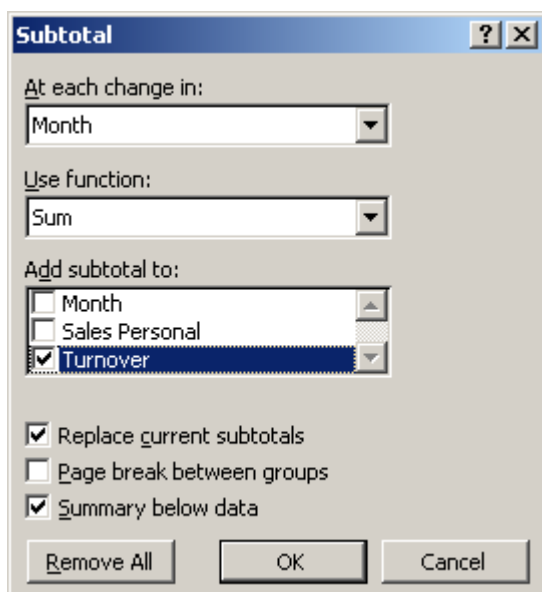
The screenshot shows the 'Advanced Filter' dialog box with the following settings: Action: Filter the list, in-place; List range: \$A\$6:\$C\$10; Criteria range: \$A\$1:\$C\$3; Unique records only: unchecked. To the right, an Excel table is shown with columns A (Type), B (Salesperson), and C (Sales). Row 2 contains 'Me' in A2, and row 3 contains '=?u*' in B3. Rows 7, 8, and 9 are filtered and highlighted in blue.

	A	B	C
1	Type	Salesperson	Sales
2	Me		
3		=?u*	
4			
5			
6	Type	Salesperson	Sales
7	Beverages	Suyama	\$5,122.00
8	Meat	Davolio	\$450.00
9	produce	Buchanan	\$6,328.00

4. Using Subtotals to Analyze a List

Microsoft Excel can automatically calculate subtotal and grand total values in a list. When you insert automatic subtotals, Excel outlines the list so that you can display and hide the detail rows for each subtotal.

To insert subtotals, you first sort your list so that the rows you want to subtotal are grouped together. You can then calculate subtotals for any column that contains numbers.



4.1 How Subtotals are Calculated

4.1.1 Subtotals

Excel calculates subtotal values with a summary function, such as Sum or Average. You can display subtotals in a list with more than one type of calculation at a time.

4.1.2 Grand Totals

Grand total values are derived from detail data, not from the values in the subtotal rows. For example, if you use the Average summary function, the grand total row displays an average of all detail rows in the list, not an average of the values in the subtotal rows.

4.1.3 Automatic Recalculation

Excel recalculates subtotal and grand total values automatically as you edit the detail data.

4.2 Create summary reports

- Sort the column you wish to perform subtotal.
- Select **Data** → **Subtotals** to popup the **Subtotal** dialog box
- In the **At each change in** box, click the column to subtotal.
- In the **Use function** box, click the summary function that you want to use to calculate the subtotals. In the example above, you would select **Sum**.
- In the **Add subtotal to** box, select the check box for each column that contains values that you want to subtotal. By default, Excel offers to subtotal the last column of your data.
- If you want an automatic page break following each subtotal, select the **Page break between groups** check box.
- To specify a summary row above the details row, clear the **Summary below data** check box. To specify a summary row below the details row, select the **Summary below data** check box. In the example above, you would clear the check box.
- Optionally, you can use the Subtotals command again by repeating steps one through seven to add more subtotals with different summary functions. To avoid overwriting the existing subtotals, clear the **Replace current subtotals** check box.
- Click **[OK]** to confirm. Excel inserts a new row at each change of column and calculates a subtotal. After you have the subtotals in, you will see small 1, 2, and 3 buttons appear below the name box. Click the 2 button to see just one line per account with the totals. Click the 3 button to see all lines.

	A	B	C	D
1	Month	Sales Personal	Turnover	
2	Jun	Vicki	\$10,000.00	
3	Jun	Susan	\$13,445.00	
4	Jun	Mary	\$12,564.00	
5	Jun Total		\$36,009.00	
6	Jul	David	\$12,346.00	
7	Jul	David	\$15,643.00	
8	Jul Total		\$27,989.00	
9	Aug	Ken	\$15,440.00	
10	Aug	Suki	\$17,741.00	
11	Aug	John	\$14,621.00	
12	Aug Total		\$47,802.00	
13	Grand Total		\$111,800.00	
14				

5. Data Form

A data form provides a convenient means to enter or display one complete row of information in a range or table without scrolling horizontally. You may find that using a data form can make data entry easier than moving from column to column when you have more columns of data than can be viewed on the screen. Use a data form when a simple form of text boxes that list the column headings as labels is sufficient and you don't need sophisticated or custom form features, such as a list box or spin button.



Customer ID:	LINO	47 of 91
Company Name:	LINO-Delicadeses	New
Contact Name:	Felipe Izquierdo	Delete
Contact Title:	Owner	Restore
Address:	Ave. 5 de Mayo Porlamar	Find Prev
City:	I. de Margarita	Find Next
Region:	Nueva Esparta	Criteria
Postal Code:	4980	Close
Country:	Venezuela	
Phone:	(8) 34-56-12	
Fax:	(8) 34-93-93	

Excel can automatically generate a built-in data form for your range or table. The data form displays all column headers as labels in a single dialog box. Each label has an adjacent blank text box in which you can enter data for each column, up to a maximum of 32 columns. In a data form, you can enter new rows, find rows by navigating, or update rows and delete rows. If a cell contains a formula, the formula result is displayed in the data form, but you cannot change the formula by using the data form. However, you cannot print a data form until you close the data form.

5.1 Create a Data Form

1. Add a column header to each column in the range or table. Excel uses these column headers to create labels for each field on the form.
2. Select the range or table which you want to add the form, and then select **Data → Form**.

5.2 Add new Record

1. Click [**New**] in the data form windows.
2. Type the information for the new record, and press [**Enter**] to add the record.
3. When you finish adding records, click [**Close**] to add the new record and close the data form.

5.3 Find a Record

5.3.1 Find a Record by Navigating

To move through records one at a time, use the scroll bar arrows in the dialog box. To move through 10 records at a time, click the scroll bar between the arrows.

To move to the next record in the range or list, click [**Find Next**]. To move to the previous record in the range or list, click [**Find Prev**].

5.3.2 Find a Record by Entering Search Criteria

To set search conditions, or comparison criteria, click [**Criteria**], then enter the criteria into the data form. To find records that match the criteria, click [**Find Next**] or [**Find Prev**]. To return to the data form without searching for records based on the criteria you specified, click [**Form**].

The following wildcard characters can be used as comparison criteria for filters, and when searching and replacing content.

Use	To Find
? (question mark)	Any single character For example, sm?th finds "smith" and "smyth"
* (asterisk)	Any number of characters For example, *east finds "Northeast" and "Southeast"
~ (tilde) followed by ?, *, or ~	A question mark, asterisk, or tilde For example, fy91~? finds "fy91?"

5.4 Change a Record

1. Find the row that you want to change.
2. Change the data in the row. To move to the next field in the row, press [**Tab**]. To move to the previous field, press [**Shift**] + [**Tab**].
3. After you finish changing data, press [**Enter**] to update the row. Excel automatically moves to the next row.

5.5 Delete a row

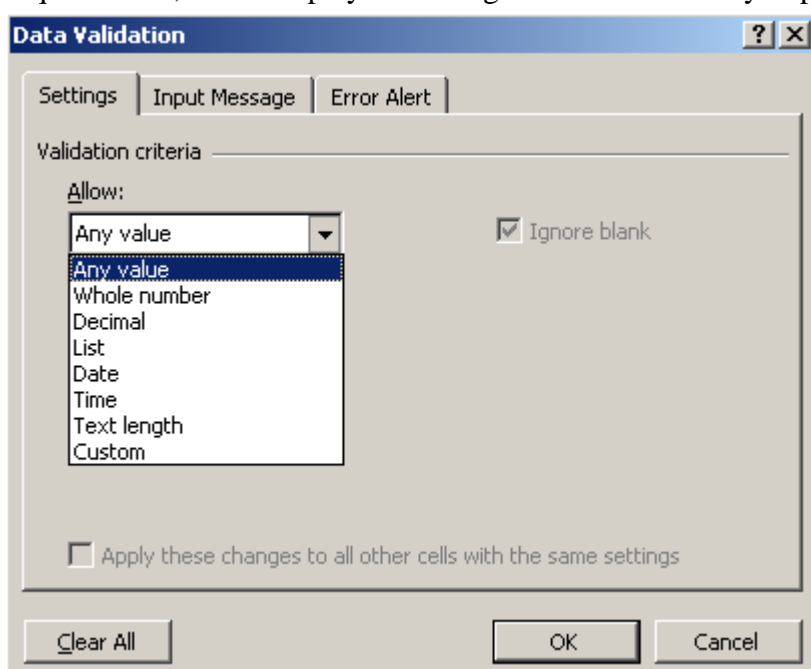
1. In the data form, find the row that you want to delete.
2. Click [**Delete**]. Excel prompts you to confirm the operation. You cannot undo a row deletion after you confirm it.

5.6 Close a data form

To close the data form and return to the worksheet, click [**Close**].

6. Validating Data Entry

Data validation is an Excel feature that you can use to define restrictions on what data can or should be entered in a cell. You can configure data validation to prevent users from entering data that is not valid. If you prefer, you can allow users to enter invalid data but warn them when they try to type it in the cell. You can also provide messages to define what input you expect for the cell, and instructions to help users correct any errors. When data is entered that doesn't meet your requirements, Excel displays a message with instructions you provide.



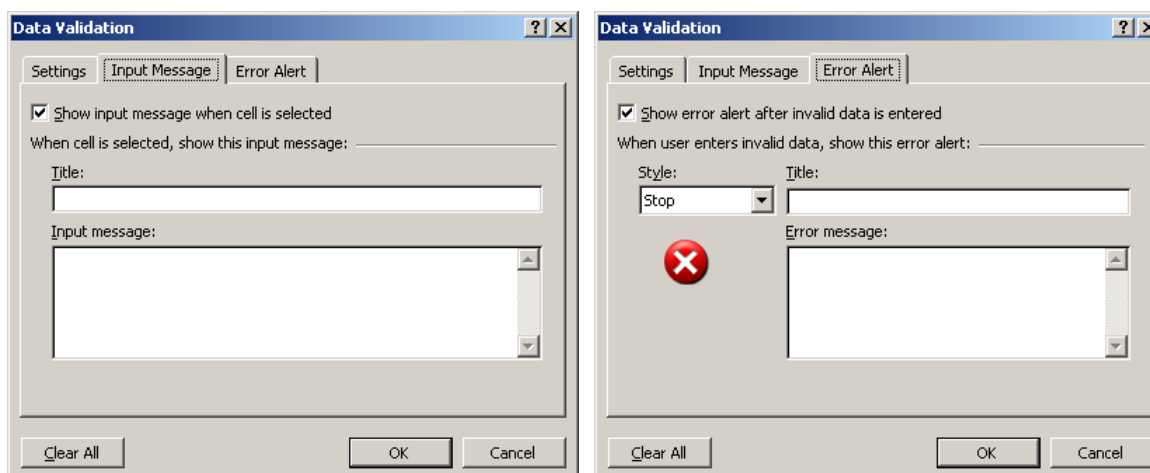
6.1 Types of data you can validate

Excel lets you designate the following types of valid data for a cell:

- Numbers:** Specify that the entry in a cell must be a whole number or a decimal number. You can set a minimum or maximum, exclude a certain number or range, or use a formula to calculate whether a number is valid.
- Dates and Times:** Set a minimum or maximum, exclude certain dates or times, or use a formula to calculate whether a date or time is valid
- Length:** Limit how many characters can be typed in a cell, or require a minimum number of characters.
- List of Values:** Make a list of the choices for a cell — such as small, medium, large — and allow only those values in the cell. You can display a dropdown arrow when a user clicks the cell to make it easy to pick from your list.

6.2 Types of messages you can display

For each cell you validate, you can display two different messages: one that appears before the user enters data, and one that appears after the user tries to enter data that doesn't meet your requirements. If users have the Office Assistant turned on, the Assistant displays the messages.



6.2.1 Input Message

This type of message appears as soon as a user clicks the validated cell. You can use it to provide instructions about the type of data you want entered in the cell.

6.2.2 Error Alert

This type of message appears only when the user types data that isn't valid and presses **[Enter]**. You can choose from three types of error messages. If you don't specify any messages, Excel flags whether the data a user enters is valid so that you can check for it later, but does not notify the user when an entry is invalid

Information Message: This message does not prevent entry of invalid data. In addition to the text you provide, it has an information icon, an OK button, which enters the invalid data in the cell, and a Cancel button, which restores the previous value to the cell.

Warning Message: This message does not prevent entry of invalid data. It has the text you provide, a warning icon, and three buttons: Yes enters the invalid data in the cell, No returns to the cell for further editing, and Cancel restores the previous value to the cell.

Stop Message: This message won't allow invalid data to be entered. It has text you provide, a stop icon, and two buttons: Retry returns to the cell for further editing, and Cancel restores the previous value to the cell. Note that this message isn't intended as a security measure: although users can't enter invalid data by typing and pressing **[Enter]**, they can circumvent the validation by copying and pasting or filling data in the cell.

6.3 Setting up Data Validation

Once you know what validation you want to use on a worksheet, you can use the **Data → Validation** to set it up. Here's a general overview of the process:

1. **Set up your worksheet** – Start by entering the data and formulas on your worksheet. If you're using a list of valid choices, enter and name your list.
2. **Define the settings for a cell** – Beginning with the first cell you want to validate, use the Data Validation dialog box to designate the type of validation you want, an input message if you want one, and an error message if you want one.
3. **Set up validation for other cells** – You can often save time by copying the validation settings from the first cell to other cells and then modifying the settings.
4. **Test your validation rules** – Try entering both valid and invalid data in the cells to make sure your settings are working as you intended and your messages are appearing when you expect. Use the Validation command to make any changes to the settings. If you make changes to the validation in one cell, you can automatically apply your changes to all other cells that have the same settings.
5. **Set up your lists of valid choices** – If you used a list of valid choices and don't want users to be able to find and change the list, you can put the list on another worksheet, set up the validation, hide the worksheet that contains the list, and then help protect the workbook with a password. The workbook password will help guard the worksheet that contains the list from others.
6. **Apply protection, if desired** – If you're planning to protect the worksheet or workbook, do that after you're finished setting up validation. Make sure you unlock any validated cells before protecting the worksheet, otherwise users won't be able to type in the cells.
7. **Share the workbook, if desired** – If you're planning to share the workbook, do that after you're finished setting up validation and protection. After you share a workbook, you won't be able to change the validation settings unless you stop sharing, but Excel will continue to validate the cells you've designated while the workbook is shared.
8. **Check the results for invalid data** – After users enter data in the worksheet, you can check for invalid data.

6.4 Entering data in validated cells

Here's what the process of entering data is like for users. You can use input and error messages to provide the instructions users need to understand how you've set up the worksheet to ensure correct data.

6.4.1 Viewing your input message

When a user clicks a validated cell or uses the arrow keys to move into the cell, your input message appears either in an Assistant balloon or a separate message box. If you provided a dropdown list for the cell, the dropdown arrow appears to the right of the cell.

6.4.2 Typing data

As the user types data or clicks the dropdown arrow to select a value from your list, the input message stays on the screen (the dropdown list may cover part of your message).

6.4.3 Entering valid data

If the user types valid data and presses **[Enter]**, the data is entered in the cell and nothing special happens.

6.4.4 Entering invalid data

If the user types data that doesn't meet your criteria, and you specified an error message for invalid data, your message appears either in an Assistant balloon or a separate message window. The user can then read the message and decide what to do.

- For an information message, the user can click **[OK]** to enter the invalid data, or click **[Cancel]** to start over.
- For a warning message, the user can click **[Yes]** to enter the invalid data, **[No]** to edit the cell some more, or **[Cancel]** to start over.
- For a stop message, the user can't enter the invalid data, and can either click **[Retry]** to edit the cell or **[Cancel]** to start over.

If you don't provide messages, entering data in validated cells is the same for users as regular Excel data entry. However, Excel does flag any cells that have invalid entries so you can easily find those entries.

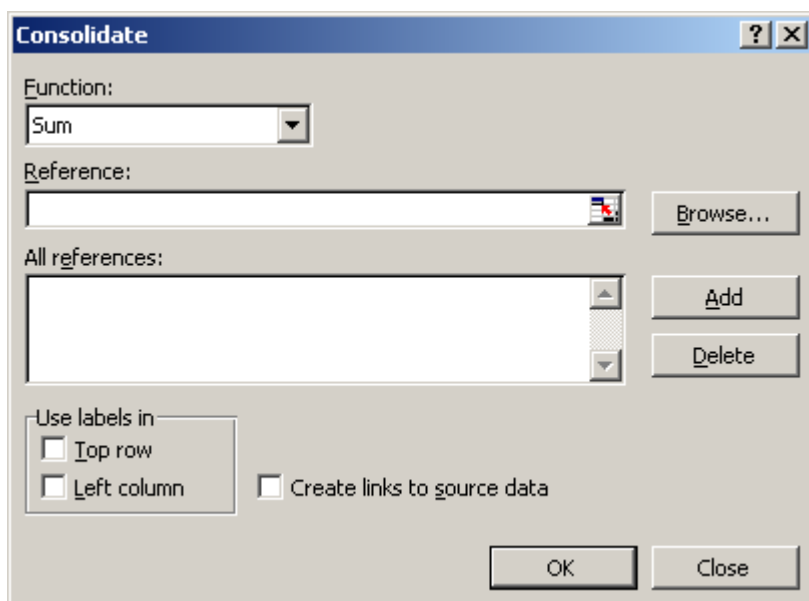
6.5 Checking a Worksheet for Invalid Entries

When you receive worksheets back from users who may have entered invalid data, you can have Excel display red circles around any data that didn't meet your criteria, making it easy to scan the worksheet for errors. Use the **[Circle Invalid Data]** and **[Clear Validation Circles]** buttons on the Auditing toolbar for this purpose. When you correct the data within the cell, the circle disappears.

	A	B	C	D	E	F
1		Budget Input -- Marketing				
2		Account		Actual	Projected	
3		Employee Costs				
4		110	Payroll	45,328	60,000	
5		120	IRS/FICA/Wk comp/State/SDI	15,997	25,000	
6		140	Retirement Plan	6,249	8,000	
7		160	Commissions/Bonuses	2,720	abcde	
8			Subtotal	70,294	93,000	
9		Subcontractors & Services				
10		201	Telecommunication Services	637	700	
11		254	Advertising	40	Hello	
12			Subtotal	677	700	
13		Total		70,971	AFADSF	
14						

7. Consolidating Data in Multiple Worksheets

To summarize and report results from multiple worksheets, you can consolidate data from each worksheet into a master worksheet. The worksheets can be in the same workbook or other workbooks. When you consolidate data, you are assembling data so you can more easily update and aggregate it on a regular or ad hoc basis.



For example, if you have a worksheet of expense figures for each of your regional offices, you might use a consolidation to roll up these figures into a corporate expense worksheet. This master worksheet might contain sales totals and averages, current inventory levels, and highest selling products for the entire enterprise.

To consolidate data, you use the **Data** → **Consolidate** to display the **Consolidate** dialog box. You can use this dialog box in several ways to consolidate your data:

- Position** Use this approach when the data in all worksheets is arranged in identical order and location.
- Category** Use this approach when each worksheet organizes the data differently, but has the same row and column labels, which you can use to match the data.
- 3-D Formulas** Use this approach when the worksheets do not have a consistent pattern you can rely on. You can create formulas that refer to cells in each range of data that you're combining. Formulas that refer to cells on multiple worksheets are called 3-D formulas

7.1 Consolidate by Position or Category

Consolidate by position when the data in all source areas is arranged in identical order and location; for example, if you have data from a series of worksheets that were created from the same template, you can consolidate the data by position.

Consolidate by category when you want to summarize a set of worksheets that have the same row and column labels but organize the data differently. This method combines data that has matching labels from each worksheet.

You can set up the consolidation to update automatically when the source data changes, but you won't be able to change which cells and ranges are included in the consolidation. Or you can update the consolidation manually, allowing you to change the included cells and ranges.

1. Set up the data to be consolidated.
2. Click the upper-left cell of the area where you want the consolidated data to appear.
3. Select **Data** → **Consolidate** to popup the **Consolidate** dialog box.
4. In the **Function** box, click the summary function you want Excel to use to consolidate the data.
5. Click the **Reference** box, click the sheet tab of the first range to consolidate, type the name you gave the range, and then click **[Add]**. Repeat this step for each range.
6. If you want to update the consolidation table automatically whenever data in any of the source ranges changes, and you're sure you won't want to include different or additional ranges in the consolidation later on, select the **Create links to source data** check box.
7. If you're consolidating by position, leave the boxes under **Use labels in** blank. Excel does not copy the row or column labels in the source ranges to the consolidation. If you want labels for the consolidated data, copy them from one of the source ranges or enter them manually.
8. If you're consolidating by category, select the check boxes under **Use labels in** that indicate where the labels are located in the source ranges: either the **top row**, the **left column**, or both. Any labels that don't match up with labels in the other source areas result in separate rows or columns in the consolidation.

7.2 Consolidate by Using 3-D Formulas

When you use 3-D references in formulas, there are no restrictions on the layout of the separate ranges of data. You can change the consolidation any way you need to. The consolidation updates automatically when the data in the source ranges changes.

7.2.1 Use formulas to combine data

In the following example, the formula in cell A2 adds three numbers that are located in different positions on three different worksheets.

	A	B	C	D	E
1					
2	=SUM(Sales!B4, HR!F6, Marketing!B9)				
3					

Sales HR Marketing Consolidation

7.2.2 Add data to a consolidation with 3-D references

When all of your source worksheets have the same layout, you can use a range of sheet names in 3-D formulas. To add another worksheet to the consolidation, just move the sheet into the range your formula refers to.

	A	B	C	D	E
2					
3		=SUM(Sales:Marketing!B3)			
4					

Facilities

Sales HR Marketing Consolidation

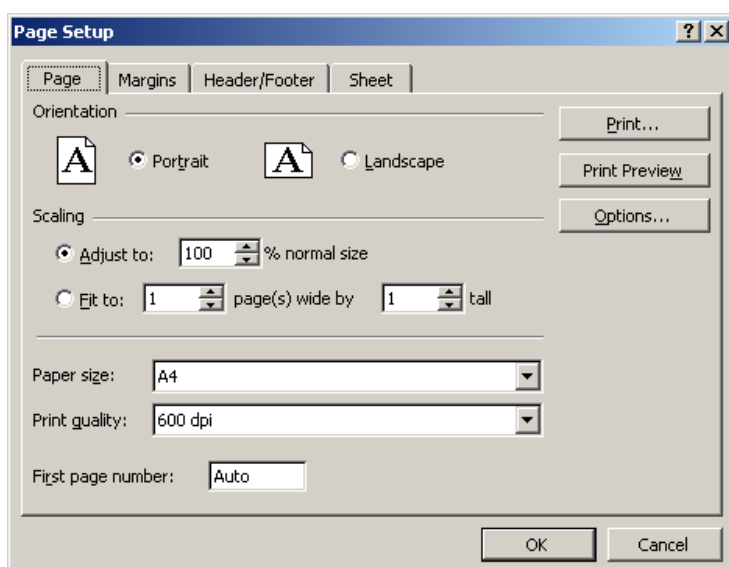
7.2.3 Step to create 3-D Formulas Consolidation

1. On the consolidation worksheet, copy or enter the labels you want for the consolidated data.
2. Click a cell that you want to contain consolidated data.
3. Type a formula that includes references to the source cells on each worksheet that contains data you want to consolidate. For example, to combine the data in cell B3 from worksheets Sheet 2 through Sheet 7 inclusive, you could type =SUM(Sheet2:Sheet7!B3). If the data to consolidate is in different cells on different worksheets, enter a formula such as this: =SUM(Sheet3!B4, Sheet4!A7, Sheet5!C5). To enter a reference such as Sheet3!B4 in a formula without typing, type the formula up to the point where you need the reference, click the worksheet tab, and then click the cell.

8. Pages Setup and Printing

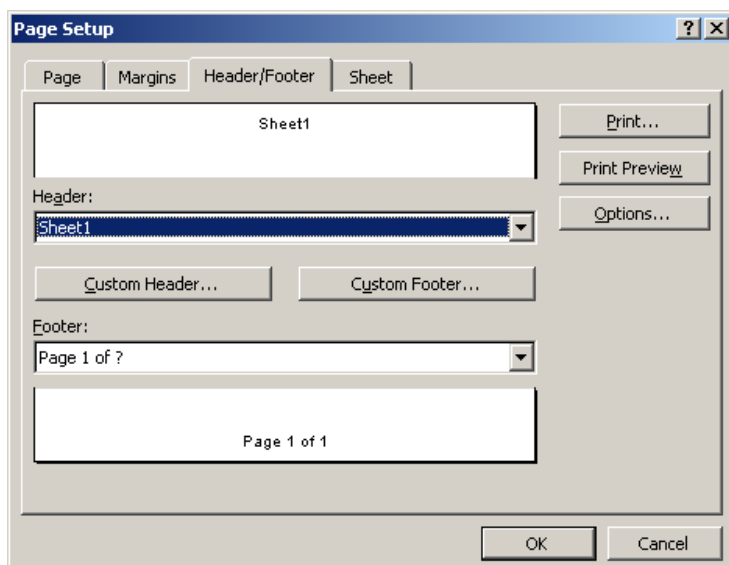
8.1 Setting the Scaling Ratio

Using the **Scaling** setting on the **Page** tab of the **Page Setup** dialog box, you can override the default size of your printouts in one of two ways: by specifying a scaling factor (10% - 400%) or by fitting the report to a specified number of pages. Excel always scales in both the horizontal and vertical dimensions.



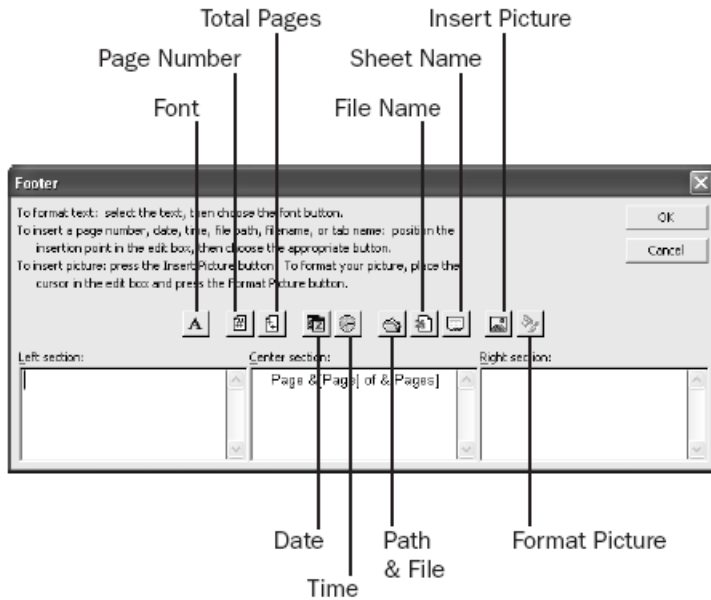
8.2 Creating Header and Footer

On the Header/Footer tab of the Page Setup dialog box, you can provide essential information about your printout (such as file name, creation date, page number, and author's name) by including a header (printed at the top of each page) or footer (printed at the bottom of each page).



8.2.1 Creating Custom Headers and Footers

If you don't find what you need in the list of predefined headers and footers, you can create your own or modify one of Excel's. If you create custom headers or footers for the current workbook, Excel adds them to these drop-down lists. Click the **[Custom Header...]** button to open the **Header** dialog box, or the **[Custom Footer...]** button to open the footer dialog box.



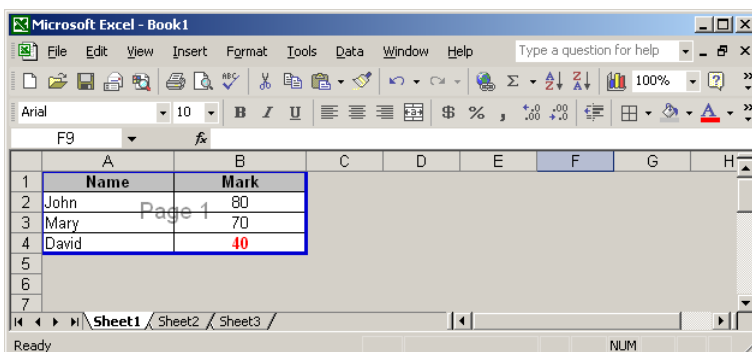
8.2.2 Adding Pictures to Headers and Footers

You can add pictures to custom headers and footers using the **[Insert Picture]** and **[Format Picture]** buttons. When you insert the picture, Excel displays **&[Picture]** in the section box of the Header or Footer dialog box. (Unlike other header and footer codes, you can't just type in this code). After you insert the picture, click the **[Format Picture]** button to specify the size, brightness, and contrast of the picture and to rotate, scale, or crop the picture.

8.3 Page Break

8.3.1 Adjusting Page Breaks

Excel makes it easy to adjust the positions of page breaks. You can do this by selecting **View → Page Break Preview**. You can move page breaks by dragging them with the mouse. You can even edit your worksheet while in **Page Break Preview** mode.



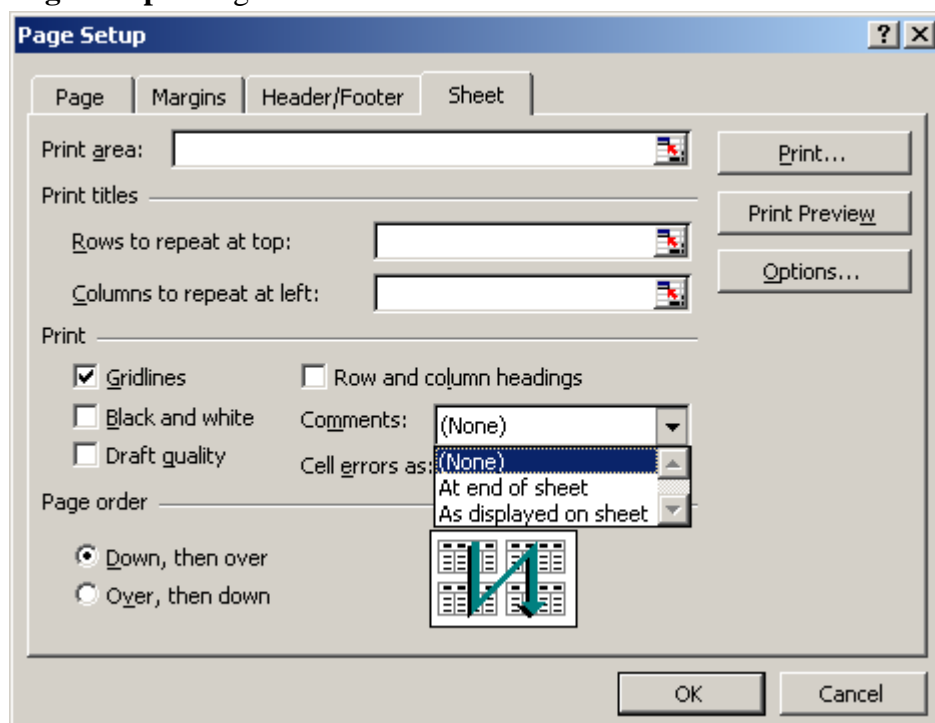
8.3.2 Inserting and Removing Manual Page Breaks

To add a page break, select any cell of the row directly beneath or in the column directly to the right of where you want the break to occur, and then choose **Insert** → **Page Break**. If you select a cell where data appears both below and to the right, Excel applies page breaks both horizontally and vertically. To remove a break, position your mouse in the row below a horizontal break, or in the column to the right of a vertical break, and then choose **Insert** → **Remove Page Break**.

8.4 Printing

8.4.1 Printing Gridlines

By default, Excel does not print gridlines, regardless of whether you have them displayed on your worksheet. If you want to print gridlines, select the **Gridlines** check box on the **Sheet** tab of the **Page Setup** dialog box.



8.4.2 Printing Comments

Comments are annotations created by selecting **Insert** → **Comment**. To make sure the comments in your worksheet are included with your printout, select one of the Comments options on the **Sheet** tab of the **Page Setup** dialog box.

- If you select **At end of sheet** from the drop-down list, Excel adds a page to the end of the printout and prints all your notes together, starting on that new page.
- If you select **As displayed on Sheet**, Excel prints the comments where they are located on a worksheet

8.4.3 Printing Drafts

If your printer offers a draft-quality mode, you can obtain a quicker, though less attractive, printout by selecting the **Draft Quality** option on the **Sheet** tab of the **Page Setup** dialog box. This option has no effect if your printer has no draft-quality mode and is most useful for dot matrix or other slow printers, or if your worksheet contains a lot of graphics.

8.4.4 Printing Row and Column Headings

If you select the **Row and column headings** option on the **Sheet** tab of the **Page Setup** dialog box, Excel prints row letters to the left of and column numbers on top of worksheet data. This option is handy when you're using printouts to document the structure of a worksheet.

8.4.5 Setting the Printing Order of Large Print Ranges

When you print a large report, Excel breaks the report into page-size sections based on the current margin and page-size settings. If the print range is both too wide and too deep to fit on a single page, Excel normally works in **Down, then over** order. If you prefer to have Excel print each horizontal chunk before moving down to the next vertical chunk, select the **Over, then down** option on the **Sheet** tab of the **Page Setup** dialog box.

8.4.6 Print Titles

When Excel breaks up a large report into pages, the column and row labels might appear only on the first page of the printout. You can use the **Sheet** tab of the **Page Setup** dialog box to force Excel to print the contents of one or more columns, one or more rows, or a combination of columns and rows on every page of a report.

If the portion of the spreadsheet you want to select is not visible, click the button on the right side of the **Rows to repeat at top** box. The dialog box collapses to give you more room; to redisplay the full dialog box, click the button on the right side of the box. Click the **Columns to repeat at left** box, and then select the column.

