MICROSOFT EXCEL
("THE END OF THE BEGNING")

READING
can take you
out of this world!
Ms. Whitman

MICROSOFT EXCEL

(“THE END OF THE BEGNING”)

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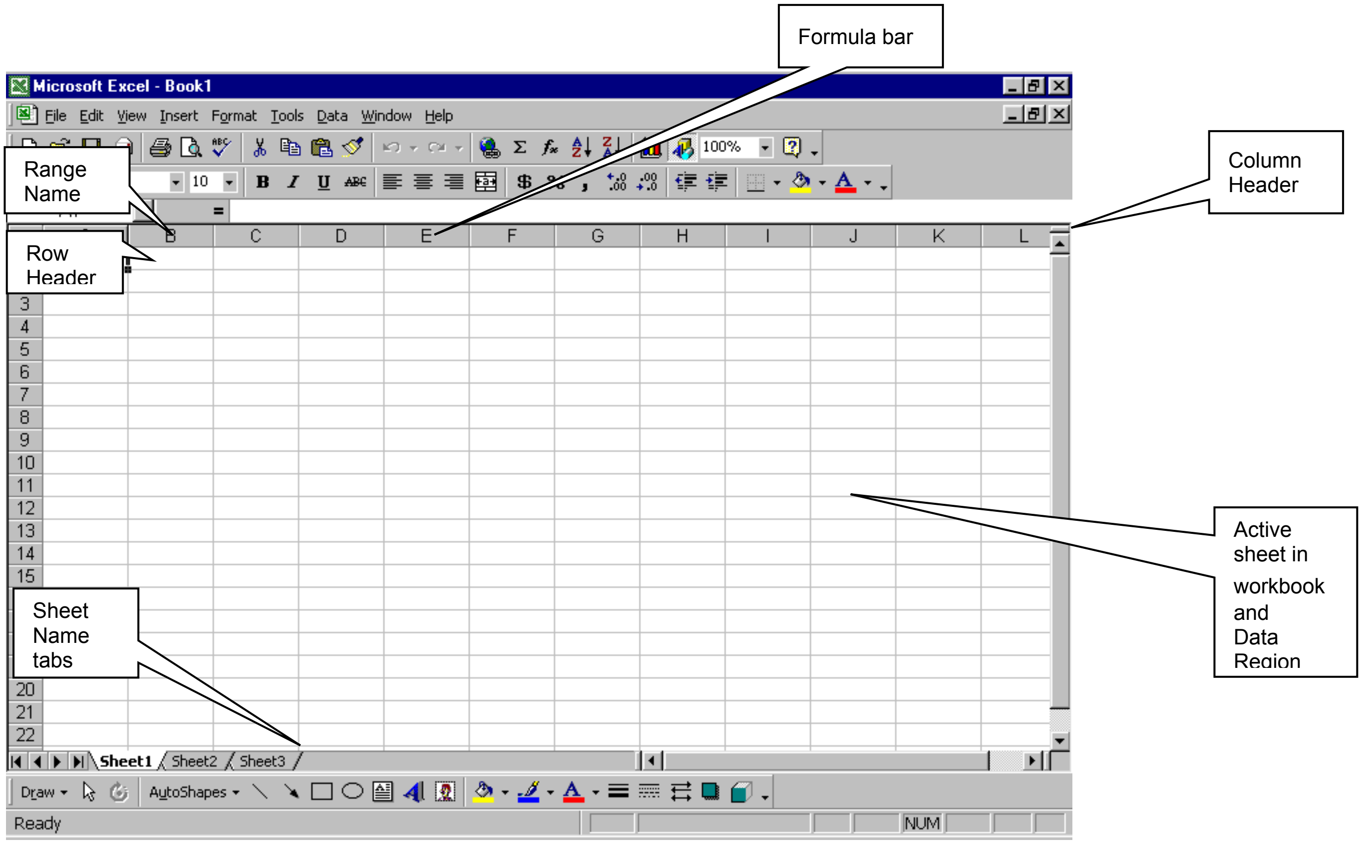
1) Basic Terms and Parts of the Screen

Workbook- term used to describe an entire Excel file.

Worksheet- (or just Sheet)**:** the individual page within each workbook.
Each workbook starts out with 3 sheets.
Can add up to 255 sheets.
The tab of the active sheet is bold.


Formula bar
Range Name
Column Header
Row Header
Active sheet in workbook and Data Region
Sheet Name tabs
Microsoft Excel - Book1
File Edit View Insert Format Tools Data Window Help
100%
10
B C D E F G H I J K L
3 4 5 6 7 8 9 10 11 12 13 14 15 20 21 22
Sheet1 Sheet2 Sheet3
Draw AutoShapes
Ready
NUM

Range name box- **lists the address of the cell currently selected.**
Formula bar- When you enter information into a cell, anything you type appears in the Formula bar. You can edit text in this bar or in the cell itself. This is also where you enter mathematical formulas.

Each worksheet is made up of columns (vertical sections) and rows (horizontal sections).
The point where the rows and columns intersect is a cell (the little squares).
Cells are identified with a letter and a number that refer to the column and row where it is located—this is the cell's address. For example the cell address A1 refers to the intersection of column A and row 1 and the cell address C6 refers to the intersection of column C and row 6.

Sheet name tabs are shown along the bottom for each sheet within the workbook. This allows you access different sheets within a workbook.

The **Data Region** is the area of a worksheet that contains data (as opposed to headings, etc.)

2) Moving from Cell to Cell

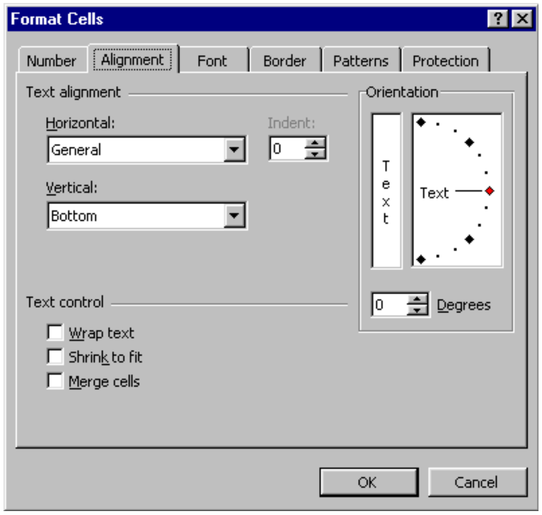
To select a cell, click in the middle of it. A thick, black border will appear.
To edit a cell, double click in the middle of it. A thinner, black border will appear and the cursor will appear in the cell OR use F2 function key from the keyboard.

To move:	**Use the keyboard:**
Up, down, left, right	Arrow keys
Left or right	Tab key *or* Shift key + Tab key
Up or down one window	Page Up *or* Page Down key
To the farthest cell in the data region in a given direction	Ctrl key + Arrow key
To the beginning of the row	Home key
To the beginning of the sheet	Ctrl key + Home key
To the last cell containing data in the sheet	Ctrl key + End key
To go to a specific cell	F5 key (GOTO) then enter the cell address

3) Format cells in a spreadsheet.

Formatting Text in Cells

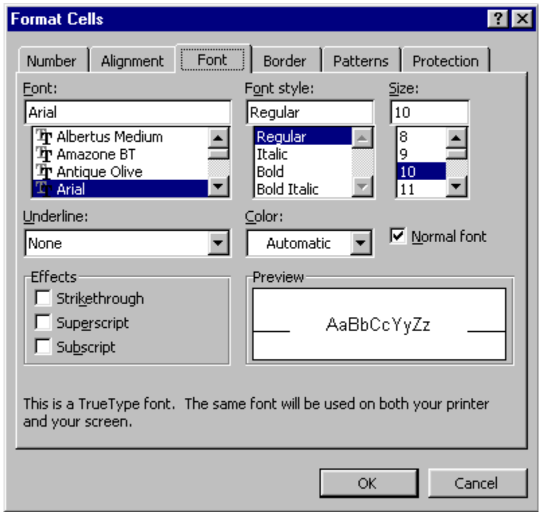
To Automatically Wrap Text
Highlight the cells, rows or columns you want.
Then click **Format** on the Menu bar then click **Cells**.
Click on the **Alignment tab**, click in the **Wrap Text check box**, and then click **OK**.


Format Cells
Number
Alignment
Font
Border
Patterns
Protection
Text alignment
Orientation
Text
Text control
OK
Cancel

Horizontal: General
Indent: 0
Vertical: Bottom
0 Degrees
☐ Wrap text
☐ Shrink to fit
☐ Merge cells

To Change the Font, Font Size, etc
Highlight the cells, rows or columns you want.
Then click **Format** on the Menu bar then click **Cells**.
Select the appropriate font, size, color, etc for the cell (whether it be text or numbers).
Click **OK**.
When you create a new worksheet, all cells are formatted with the General number format.

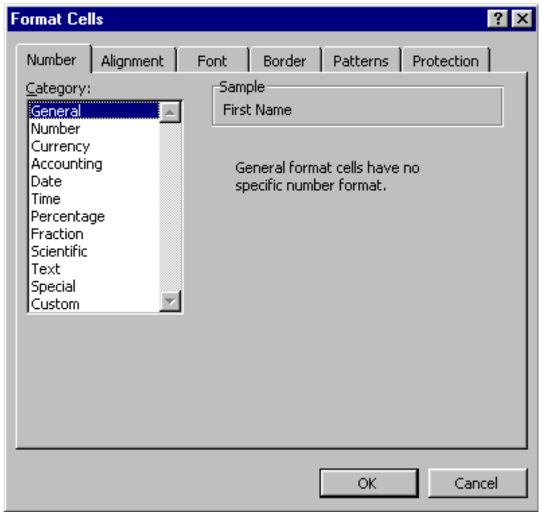
When it can, Microsoft Excel automatically assigns the correct number format to your entry. For example, when you enter a number that contains a dollar sign before the number, Microsoft Excel automatically changes the cell's format to a currency format.


Format Cells
Number
Alignment
Font
Border
Patterns
Protection
Albertus Medium
Amazone BT
Antique Olive
Arial
Regular
Italic
Bold
Bold Italic
8
9
10
11
Effects
Preview
AaBbCcYyZz
OK
Cancel

Font: Arial
Font style: Regular
Size: 10
Underline: None
Color: Automatic
☑ Normal font
☐ Strikethrough
☐ Superscript
☐ Subscript

This is a TrueType font. The same font will be used on both your printer and your screen.

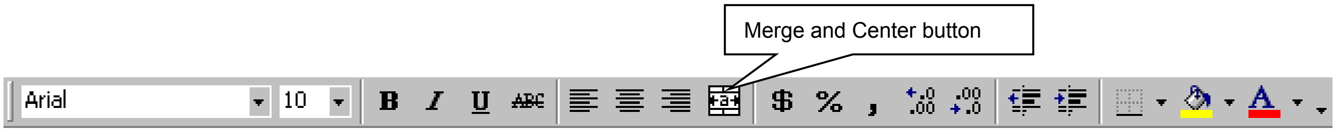
If a number is too long to be displayed in a cell, Excel displays a series of number signs (####) in the cell. If you widen the column enough to accommodate the width of the number, the number is displayed in the cell.


Format Cells
Number
Alignment
Font
Border
Patterns
Protection
Category:
General
Number
Currency
Accounting
Date
Time
Percentage
Fraction
Scientific
Text
Special
Custom
Sample
First Name
OK
Cancel

General format cells have no specific number format.

To Change the Formatting of Cells Containing Numeric Values
Highlight the cells, rows or columns you want.
Then click **Format** on the Menu bar then click **Cells**.
From the **Category list**, choose the type of number you wish to format.
Depending on the category you select, the right side of the Format Cells dialog box will display some options for that category. Make your selections then click **OK**.
Merging Cells

To Enter Text that Binds Several Cells
Enter text into a cell.
Select the range of cells you want the text to occupy by clicking on the first cell in your range, and then drag your mouse across the cells you want to merge.
Click the **Merge and Center button** on the Formatting toolbar.


Merge and Center button
Arial
10
B
I
U
ABC
$
%
,

4) Naming your Worksheets

When you open a new workbook, three sheets are displayed by default. These are generically labeled.
To Rename Worksheets
Make sure the worksheet you wish to rename is selected or active.
Click Format on the Menu bar, point **Sheet**, and then click **Rename**.
The sheet name tab of the current worksheet will become highlighted. Just start typing the name you want.
Click anywhere in your worksheet when you are finished.

Alternative Method to Rename Worksheets
Double click on the tab for the sheet you want to rename OR F2 function from the Keyboard.
The sheet name tab of the current worksheet will become highlighted. Just start typing the name you want.
Click anywhere in your worksheet when you are finished.

5) Add or delete new columns, rows, or worksheets.

Adding Columns, Rows, or New Worksheets

To Insert Columns
Select the column that is to the right of where you want the new column inserted. (Columns are inserted to the left of the selected column.)
Click **Insert** on the Menu bar, and then click **Columns**.

To Insert Rows

Select the row that is under where you want the new row inserted. (Rows are inserted above the selected row.)
Click **Insert** on the Menu bar, and then click **Rows**.

To Insert Worksheets
Click **Insert** on the Menu bar, and then click **Worksheet**.

It may then be necessary to rearrange the order of the sheets. To rearrange the sheets, simply drag the appropriate sheet to its new location.

Deleting Columns, Rows, or New Worksheets

To Delete Columns
Select the column to be deleted by clicking the appropriate column header button.
Press the **Delete key** on the keyboard.

To Delete Rows
Select the row to be deleted by clicking the appropriate row header button.
Press the **Delete key** on the keyboard.

To Delete Worksheets
Select the sheet to be deleted by clicking the appropriate sheet tab.
Click **Edit** on the Menu bar then click **Delete Sheet**.
Click **OK** to confirm the deletion.

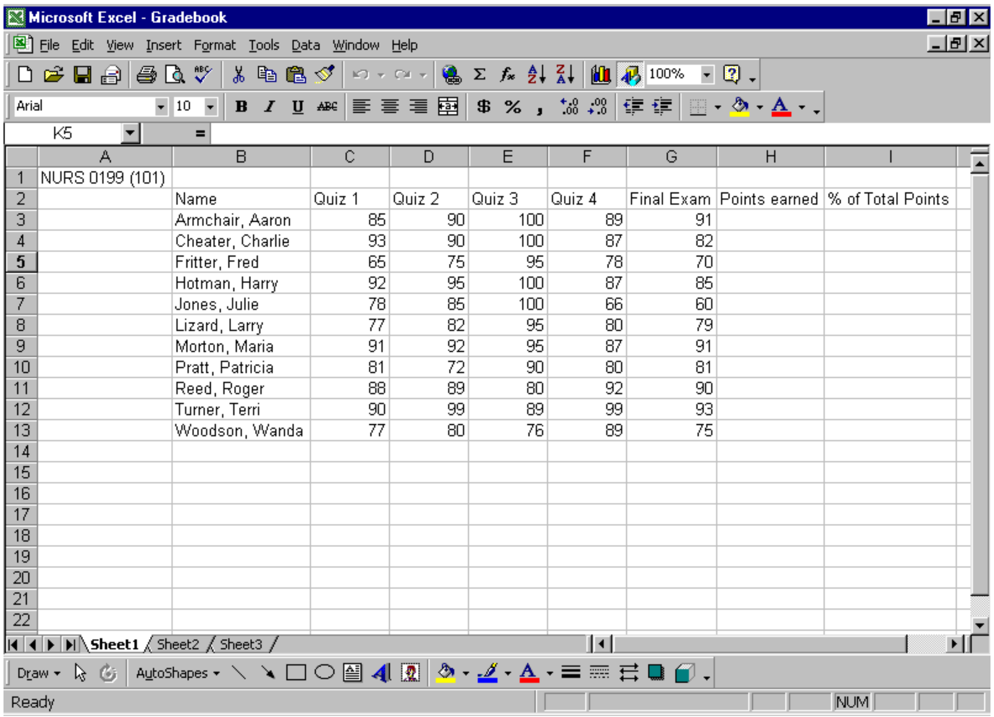
Be careful when deleting rows, columns, or worksheets because you will delete all data stored in those locations.

6) Formulas: Entering and Manipulating Data

In order to manipulate data stored in a spreadsheet, you need to create formulas.
Some basic facts about using formulas in Excel are as follows:
All formulas begin with an equal (=) sign.
Data that is stored in the worksheet and that needs to be used in a formula is referenced using the cell's address.

The following mathematical operators can be used when creating a formula: +, /, -, and *. These are in addition to a plethora of built-in functions available to us through Excel such as Average, Minimum, Maximum, Standard Deviation, Sum—just to name a few.

Manual


Microsoft Excel - Gradebook
File Edit View Insert Format Tools Data Window Help
100%
Arial
10
K5
=
Sheet1
Sheet2
Sheet3
Draw
AutoShapes
Ready
NUM

	A	B	C	D	E	F	G	H	I
1	NURS 0199 (101)								
2		Name	Quiz 1	Quiz 2	Quiz 3	Quiz 4	Final Exam	Points earned	% of Total Points
3		Armchair, Aaron	85	90	100	89	91		
4		Cheater, Charlie	93	90	100	87	82		
5		Fritter, Fred	65	75	95	78	70		
6		Hotman, Harry	92	95	100	87	85		
7		Jones, Julie	78	85	100	66	60		
8		Lizard, Larry	77	82	95	80	79		
9		Morton, Maria	91	92	95	87	91		
10		Pratt, Patricia	81	72	90	80	81		
11		Reed, Roger	88	89	80	92	90		
12		Turner, Terri	90	99	89	99	93		
13		Woodson, Wanda	77	80	76	89	75		
14									
15									
16									
17									
18									
19									
20									
21									
22									

Calculations

To manually calculate values means using some of the standard mathematical operators and not the built-in functions. For instance, using the figure on page 5, if I wanted to find the sum of all four quizzes and the final exam, I could enter the following formula in cell H3:

=C3+D3+E3+F3+G3

This would add the values stored in the cells listed in the formula and store the result in cell H3. Once the formula is created, press Enter to actually execute the formula.

Manual calculation formulas work fine for entering a basic formula, but can get labor intensive. Instead, you can use a **function** to make the job easier.

Functions

A function is a prewritten named formula that takes a value, performs an operation and returns a value. To use built-in function in a formula, type the equal sign in the cell where you wish to store the resulting value, type the name of the function, and then type the argument in parenthesis. The argument is what identifies the range of cells to be included in your formula.

For instance, instead of typing the formula:

=C3+D3+E3+F3+G3

You can use the built-in Sum function to build a formula. To find the sum of all four quizzes and the final exam, I could insert the following formula in cell H3:

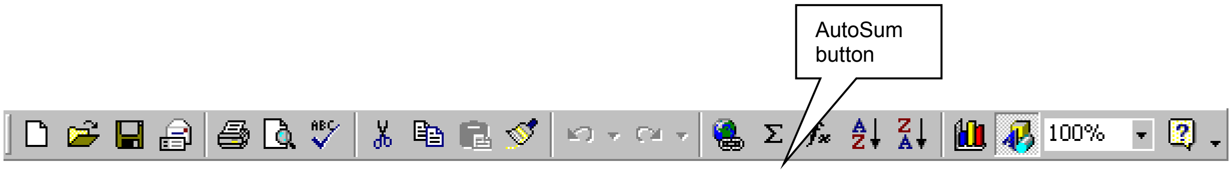
=SUM(C3:G3)

This would add the values stored in the range of cells listed in the formula and store the result in cell H3. Once the formula is created, press Enter to actually execute the formula.

To Create a Formula Manually

Select the cell that will contain your total, type = (the equal sign) then enter your cell addresses along with any mathematical operators.

To Create a Formula using SUM
Select the cell that will contain your total, click on the **AutoSum button** on the Standard toolbar.



Excel will put a dotted line around the cells it thinks you want to add. If that is correct, just press the **Enter key** on the keyboard. If not, then edit the cell addresses in the formula bar then press the **Enter key** on the keyboard.

Copying Formulas

All of the instructions for creating a formula involve placing that formula into ONE cell. Often, a formula can be used basically unchanged in more than one cell. A formula can be copied to other cells and used effectively by only changing some of the cell references or addresses used in that formula. For instance, going back to earlier examples, if I wanted to place a formula to calculate the sum of cells C4 through G4 in cell H4 and I already had a formula stored in cell H3 that calculates the sum of cells C3 through G4 then I could use Excel's AutoFill feature to copy the formula to other locations.

AutoFill is a command you can use when you want to copy the same formula across a range of adjacent cells. AutoFill will automatically change cell addresses depending on where the new formula is being copied. In this example, I am only copying the formula in cell H3 down one row to Row 4. AutoFill would automatically change the cell addresses in the formula to reflect the move to row 4. AutoFill would just add 1 to the current row references in the formula and leave the column portion of the reference untouched. If I were copying the formula down many rows, AutoFill would just keep updating the row references. This would also apply if I were copying the formula to different columns or to a combination of different rows and columns.

To Use AutoFill

Click on cell that has the formula you want to select it.
Move the mouse pointer to the bottom right corner of the cell. Place the mouse pointer on the dark square found in the corner. You will know when you are there because a solid black cross will appear instead of your pointer.
Then hold down your left mouse button and drag your pointer across the cells you want to AutoFill. As you drag across, you will see a dotted line appear around the cells.
Once you've highlighted the cells you want to AutoFill, release your mouse button. The totals will fill in.

When you use the AutoFill feature, Excel is adapting the formula to the new **Relative** position for each cell address.

Excel recognizes two types of cell references when it is creating a formula: Relative and Absolute. A **Relative Reference** is a type of cell reference we have been working with up to this point. It means that if you copy or move a formula from one cell to another, Excel modifies the formula automatically for the new position. An **Absolute Reference** is a type of cell reference that means if you copy or move the formula to another cell, the cell reference will not change. You can use an absolute reference to keep both the row and column in a cell address from changing or you can break it up and keep either the row or the column from changing. Absolute references are good to use when you have a formula value that will only be changed occasionally and is used in several formulas. For instance, if you usually have 1000 possible points in your grading scale, you would want to store the 1000 in a cell and use an absolute reference to it in all your formulas that calculate the average using the 1000 possible points. That way, if you ever change the possible points to something say 1050 then you will only need to change the value in the one cell instead of in several formulas.

To Create an Absolute Reference

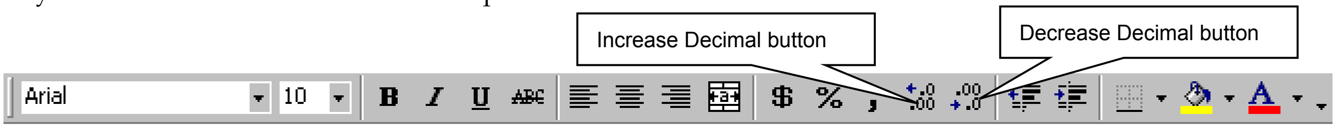
To create an absolute reference in a formula, type a $ before the letter (column reference) and/or the number (row reference) in the cell's address for example $F$5 or $C6 or G$7.

7) Apply cell formatting.

More Cell Formatting

If you get a number that shows too many decimal places (or not enough) you can easily have Excel add or remove some places. Excel will even take care of the rounding for you.

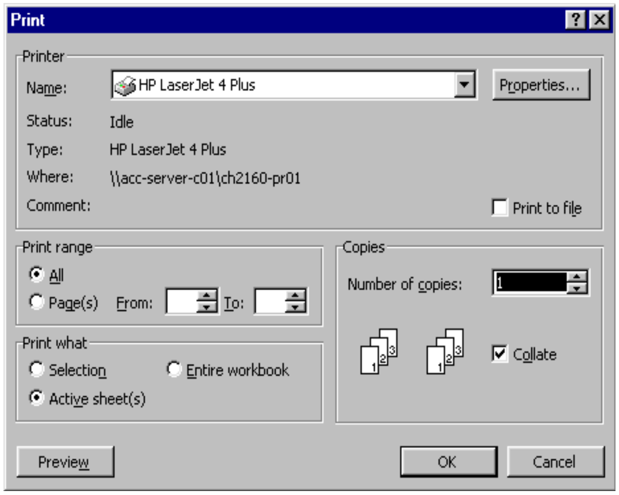
To Increase/Decrease Decimal Places
Select the cell that contains the number to be formatted.
Click either the **Increase Decimal** *or* the **Decrease Decimal button** on the Formatting toolbar as many times as you need to show the correct decimal places.



8) Printing

Setting the Print Area:

Once you have entered all of your data, calculated your formulas, created your charts and formatted your spreadsheet, you are ready to print.



Name: HP LaserJet 4 Plus
Status: Idle
Type: HP LaserJet 4 Plus
Where: \\acc-server-c01\ch2160-pr01
Comment:
☐ Print to file
● All
○ Page(s) From: To:
Number of copies: 1
○ Selection
○ Entire workbook
● Active sheet(s)
☑ Collate

To Print a Selection

Highlight everything in your spreadsheet you want to print. This includes your title, headings, data field and charts.
Click **File** on the Menu bar then click **Print**.
Select the **Selection radio button** in the Print what section.
Click **OK**.

To Print a Sheet

Make sure you are viewing the sheet you wish to print.
Click **File** on the Menu bar then click **Print**.
Select the **Active sheet(s) radio button** in the Print what section.
Click **OK**.

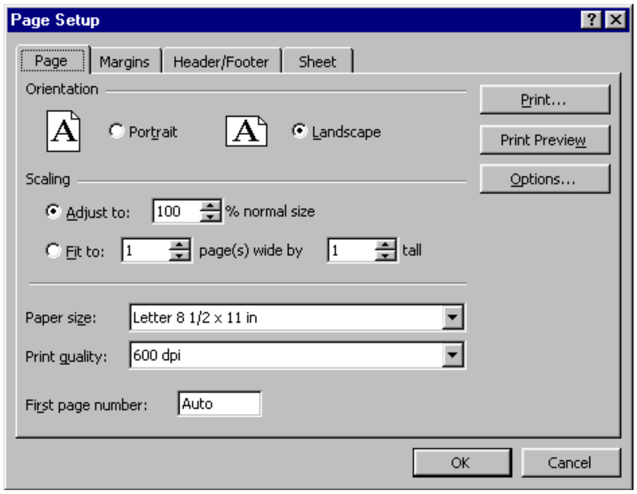
NOTE: Keep in mind that a sheet may have many pages.

To Print an Entire Workbook

Click **File** on the Menu bar then click **Print**.
Select the **Entire workbook radio button** in the Print what section.

Click **OK**.

To Select Page Orientation (Portrait or Landscape)
Click **File** on the Menu bar then click **Page Setup**.
Click the **Page tab**, if necessary.
In the Orientation section, click either the **Portrait radio button** *or* the **Landscape radio button**.
Then click **Print** to actually print at that time *or* click **OK** to continue working.

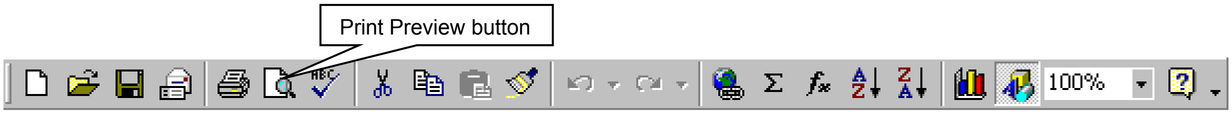

Page Setup
Page
Margins
Header/Footer
Sheet
Print...
Print Preview
Options...
OK
Cancel

Orientation
○ Portrait ● Landscape

Scaling
● Adjust to: 100 % normal size
○ Fit to: 1 page(s) wide by 1 tall

Paper size: Letter 8 1/2 x 11 in
Print quality: 600 dpi
First page number: Auto

To Use Print Preview
Click the **Print Preview button** on the Standard toolbar.


Print Preview button
100%

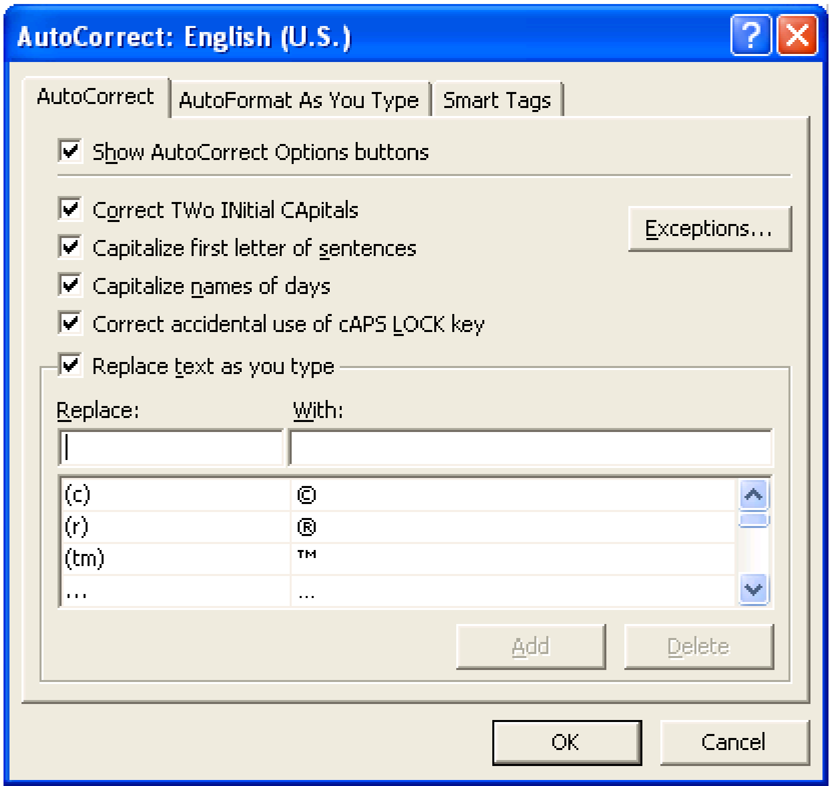
Click the **Close** button on the Print Preview toolbar to exit Print Preview.

9) Window Spilt & Freeze

Many a times, one wants to refer to two different sections of a worksheet. For example, in case of a long list, the headings might scroll up. In that event, one can consider to split the window into two parts. One can position the cell pointer to the cell where one desires a split and choose the command Split from the Window Menu.
To remove the split choose Window>Unsplit.
While the movement of the split windows is synchronized, none of them is fixed.
Therefore, it is possible to loose track of the titles if the mouse movements are not properly handled. To avoid such a situation, one can choose Window->Freeze Panes.
To reverse the process, choose Window->Unfreeze Panes.

10) Auto Correct

The AutoCorrect feature automatically corrects common typing errors as you type. For this purpose, Excel uses a database of commonly misspelled words. This database can be customized from the Tools -> AutoCorrect Menu. The following screen comes up:


AutoCorrect: English (U.S.)
AutoCorrect
AutoFormat As You Type
Smart Tags
Exceptions...
Add
Delete
OK
Cancel

☑ Show AutoCorrect Options buttons

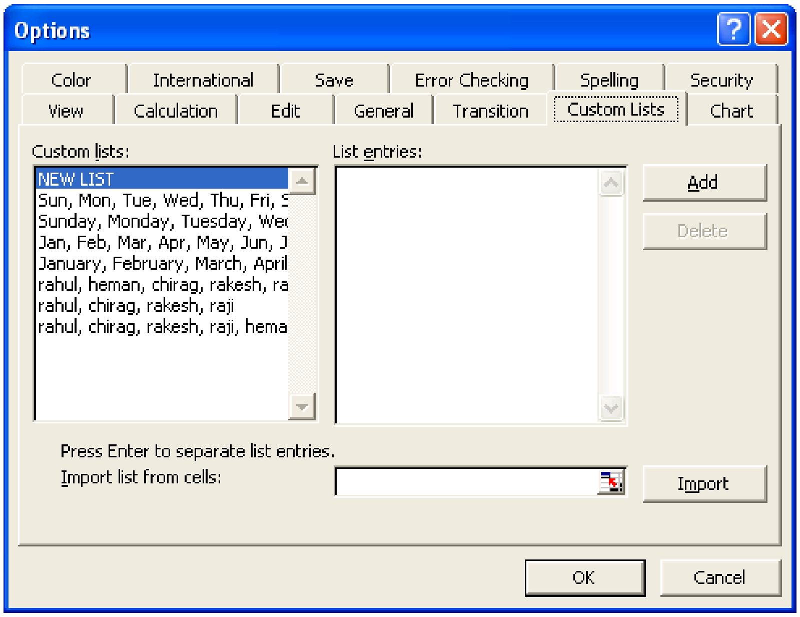
☑ Correct TWo INitial CApitals
☑ Capitalize first letter of sentences
☑ Capitalize names of days
☑ Correct accidental use of cAPS LOCK key
☑ Replace text as you type

Replace:	With:
(c)	©
(r)	®
(tm)	™
...	...

One can use the AutoCorrect feature to quickly type some normal text which is regularly used in an organization. For example, the organization name can be made a subject matter of AutoCorrect to speeden up data entry.

11) Auto Fill

AutoFill is an in-built feature whereby one can fill up a particular range of cells based on some pre-determined series. For example, if one cell contains January and the next one contains February, one can just use the fill handle to automatically complete the entire range with the month names. One can create custom lists pertaining to one's organization.


Options
Color
International
Save
Error Checking
Spelling
Security
View
Calculation
Edit
General
Transition
Custom Lists
Chart
Custom lists:
List entries:
Add
Delete
Import
OK
Cancel

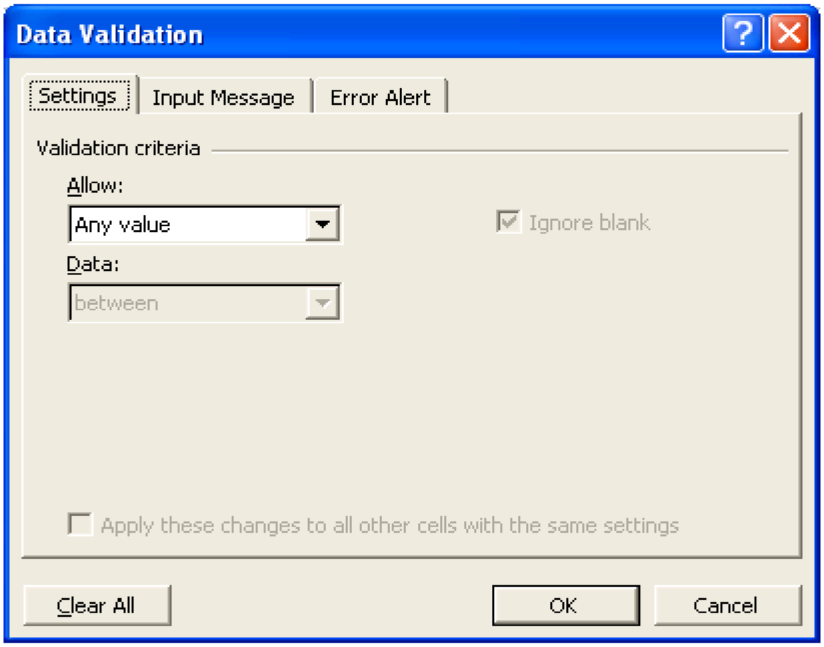
NEW LIST
Sun, Mon, Tue, Wed, Thu, Fri, S
Sunday, Monday, Tuesday, Wed
Jan, Feb, Mar, Apr, May, Jun, J
January, February, March, April
rahul, heman, chirag, rakesh, ra
rahul, chirag, rakesh, raji
rahul, chirag, rakesh, raji, hema

Press Enter to separate list entries.
Import list from cells:

12) Data Validation

At times, there may be a need to restrict the content that is being typed into a particular cell. For example, one may want the residential status to be either “Resident” or “Resident but Not Ordinarily Resident” or “Non Resident”. In such a case, the entry into a particular cell can be validated through the “Data Validation” Feature. The steps for data validation feature are explained below:

1. Select the cell/range for which validation is to be applied
2. Choose Data -> Validation from the menu. The following screen appears



Allow: Any value

Data: between

☑ Ignore blank

☐ Apply these changes to all other cells with the same settings

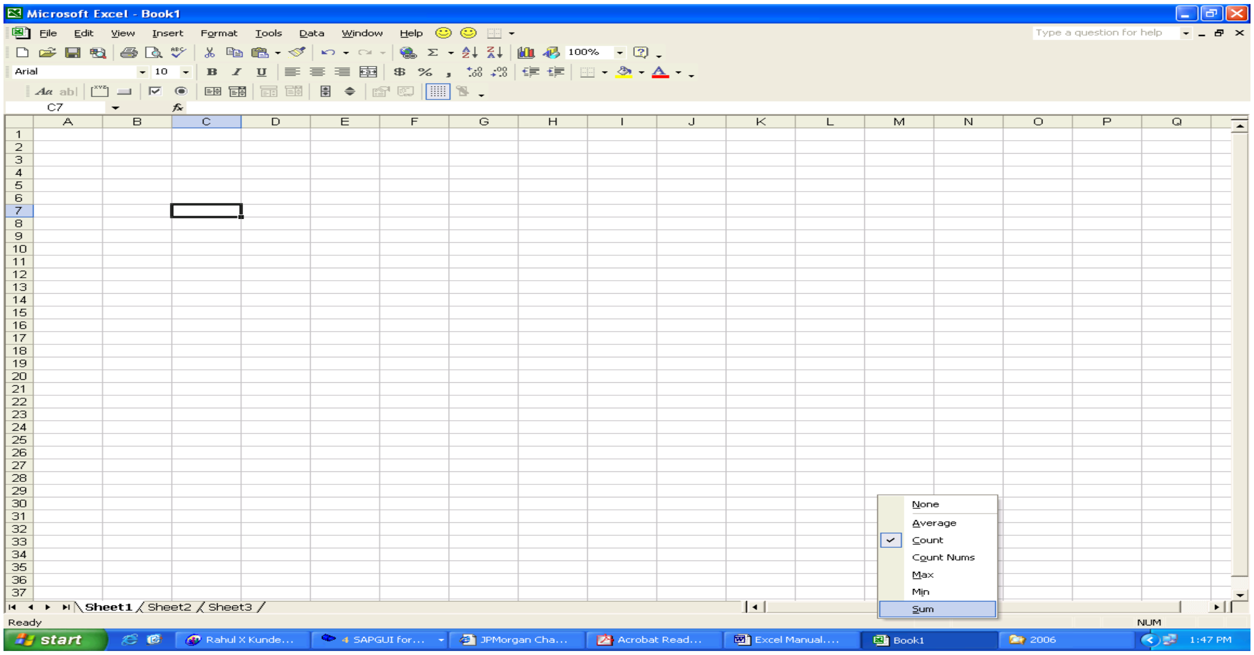
3. This feature validates only Keyboard Input that too in cases where the entry is made **after the validations** are set and hence may have limitations
4. The user can choose the type of data and the range of data (which may be open-ended from one side). Alternatively, the user can specify a predefined list to choose from
5. The user can also specify the action to be taken in case the data entered is invalid
   ”STOP” does not permit entry of invalid Data
   “WARNING” allows alteration to invalid data. The user may still continue with the invalid data
   “INFORMATION” just informs about the invalid data
   Unchecking the “CHECK BOX” on the top allows entry of invalid data without any disturbance

13) Sum Function

The ideal way to total a particular range of numbers is therefore to use the SUM() function. The standard usage of the SUM function has already been considered. Of importance to note is the fact that one can total multiple non-contiguous ranges using a single SUM function. Just separate the range addresses by a comma. One can also use range names instead of the cell attributes to make the function more meaningful for the users.

Quick Sum

Many a times, one just wants to refer to the total of a particular range of cells. For this purpose, one need not insert the SUM function and delete it thereafter. MS-EXCEL presents built-in totals on selection of a range at the status bar which appears at the bottom of the sheet. Even the Quicksum feature can be customized to show either the total or the maximum, minimum, average, count, numeric counts and so on. To customize the Quicksum feature, right click at the place where the sum is displayed and the following options appear:



Sub Total

In case there are nested totals, the SUM function can create havoc as there would be multiple totals. In such a situation one can consider the use of SUBTOTAL() function. This function avoids the cascading effect of the SUM function by recognizing the multilayered totaling feature. Accordingly, a subtotal function ignores the value of another subtotal function in the selected range of cells. The subtotal function is not restricted merely to the summation but can also be used for counts, etc. Accordingly, the SUBTOTAL() Function requires an additional argument which is the function number. The various function numbers and the action performed by them are tabulated below: Accordingly, to get a subtotal of the cells in A2 to A9, one will use the function =SUBTOTAL(9,A2:A9)

14) Sort

In case a list of data is typed, one may need the data arranged in a particular fashion. For example, you may want your client details either alphabetically or based on the client

codes. This is where sorting is useful and the same is very simple. Choose the relevant command from the Data Menu and the Sort Wizard takes you through the rest of the process. Remember, sorted data is always advantageous from three counts: firstly, it improves readability, secondly, it permits effective lookups and lastly, it lays down the

foundation for data grouping and sub-totaling.
Sorting is a permanent process as compared to filtering which is a temporary process
Choose any cell in the data range and Select Data -> Sort
Choose successive sort keys and sort order
On a brief review of the above screen, one understands that the sort function permits sorting only upto three levels of data. If sorting is required for multiple levels of data, then one will have to use the sort function more than once. Sort first based on keys of least significance and move to keys of higher significance.

15) Sub-Totals

At times, there is a need to not only have grand totals but also subtotals – would you not like to have group-wise outstanding as well as total outstanding? For this purpose, one can use the Subtotals Function in the Data Menu. The Function is versatile and permits to have multiple levels of subtotals (for having such multiple levels, do not replace the current subtotals). Only care required is to sort the list in the same order of subtotaling before using the subtotals command otherwise you might end up in a mess. One can also consider the use of page-break option if you want individual reports for individual groups. And if things appear messy, just remove all subtotals and Start Afresh!
To subtotal data in a spreadsheet follow these steps:
1. Decide upon the column you wish to use for the subtotal.
2. Sort the data using the criterion you selected in step 1.
3. Select Data/Subtotal. Complete the subtotal window that appears and click OK.
4. Subtotals will now appear in the spreadsheet. Subtotals can be isolated from raw data using the gray view bar to the left. Clicking the (-) boxes will reduce data, clicking the (+) box will restore data.
5. Clicking the small 1,2,3, boxes in the upper left corner will reduce or expand all categories of data simultaneously.
6. To remove subtotals select Data/Subtotal and click on the "Remove All" button.

16) Auto Filter

In case of multiple records and large databases, there may be a need to restrict the report to certain types of transactions. For example, if you are maintaining your sale details in MS-EXCEL, you may be interested in a quick list of all the sales made to a particular customer. This requirement is known as a query. Again, Excel has an excel-lent (!) feature to do this. One just needs to use it to believe it. Yes, we are talking of AutoFilter – the feature which displays a subset of data without actually sorting or moving data. Once you select the AutoFilter command from the Data Menu, Excel inserts drop down arrows next to column headings in the list. Selecting an item from a drop down list hides all rows except rows that contain the selected value. One can edit and format the cells which are visible.
Choose any cell in the data range and Select Data -> Filter -> AutoFilter
Use the drop down lists to specify criteria. Criteria can be
1. Particular Value
2. Top/Bottom (no of items) in terms of value or percentage

3. Range through Custom Criteria
4. Blanks/ Non-Blanks
Various criteria in differing columns are cumulative (AND) condition
Remove criteria in specific column by choosing "All" from the drop down list

Remove criteria in all columns by choosing Data -> Filter -> Show All

17) Advanced Filter

The filtered data can also be copied into another area by the simple process of copy-paste. One limitation of AutoFilter is that one can have multiple alternative criteria (OR condition to be more specific) for a single field, one can also have cumulative multiple criteria (AND condition) across multiple fields but one cannot have alternative multiple criteria across various fields. To cover such complex searches, one has to take recourse to the Advanced Filter Option. Here, one specifies the conditions in a separate range known as the criterion range. The results can be filtered in the original list or in another range of cells.

Useful for specifying criteria which are alternative in nature (OR) condition
Make use of a “criteria range”
Select Data -> Filter -> Advanced Filter
The filtered data may be copied to another range for subsequent analysis
Revert back to original data by choosing Data -> Filter -> Show All

The Advanced Filter can also be used to delete duplicate records in Microsoft Excel. For this one needs to filter for unique records and then use the resulting rows to overwrite the source cells. The entire procedure is summarized in the table given below:

1. In the list you want to filter, select the column or click a cell.
2. On the Data menu, point to Filter, and then click Advanced Filter.
3. In the Advanced Filter dialog box, click Copy to another location.
4. In the Copy to box, type a cell reference.
5. Select the Unique records only check box, and then click OK.
6. Select the data returned by the filter, and then click Cut on the toolbar.
7. Select the source data, and then click Paste on the toolbar.

18) Text Functions

Function	**Description**
Concatenate	Joins several text strings into one text string.
Exact	Checks whether 2 strings are exactly the same and returns True or False. (Its case sensitive)
Dollar	Converts a number to text, using currency format.
Left	Returns the specified number of characters from the start of a text string.
Right	Returns the specified number of characters from the end of a text string.
Mid	Returns the characters from the middle of a text string, given a starting position and length.
Upper	Converts a text string to all uppercase letters.
Lower	Converts a text string to all lowercase letters.
Len	Returns the number of characters in a text string.
Proper	Converts a text string to proper case, the first letter in each word in uppercase and all other in

	lowercase.
Replace	Replaces part of a text string with a different text string.
Rept	Repeats text a given number of times.
Trim	Removes all spaces from a text string except for a single space between the words.

19) USEFUL FUNCTIONS

The functions we shall look at first are:
AVERAGE
COUNT
COUNTA
COUNTBLANK
COUNTIF
MAX
MIN
SUMIF

We will start each description with what the function does, followed by its **syntax** and then the number of **arguments** it can accept. It is important to note that while some functions take more than one argument it is **not always** the case that they must all be supplied.

These arguments are known as **option arguments** and I will identify these in the syntax description by not bolding the argument. For example the **SUM** function can take up to 30 arguments, but only **one** of the thirty **needs** to be supplied, so I would show this as below, eg:

Syntax SUM(**number1**,number2,...) Meaning "number2,…. to number 30" are all optional arguments while "**number1**" must be supplied.

AVERAGE

The AVERAGE function is used to return the average of the arguments supplied.
Syntax
AVERAGE(number1,number2, ...)
The AVERAGE function can take up to 30 arguments.
The arguments supplied must be numeric or references to numeric values. Text and/or references to text are ignored. It is important to note that cells containing zeros are NOT ignored. This can give you unexpected results if you are not aware of it.
=AVERAGE(A1:A3) would equal 10 if A1:A3 contained 5, 10, 15 respectively

COUNT

The COUNT function is used to count numbers or references to numbers in a range.
Syntax
COUNT(**value1**,value2, ...)
The COUNT function takes up to 30 arguments and each argument can be a variety of data types, but only numbers are counted.

If the range reference supplied contains valid dates these will also be counted.
=COUNT(A1:A5) would equal 3 if cells A1:A5 contained 10, 12/12/2001, house, 0, dog

COUNTA

The COUNTA function is used to count non-empty cells.
Syntax
COUNTA(**value1**,value2, ...)
The COUNTA function takes up to 30 arguments and each argument should be a reference to a range. Cells within the range can be a variety of data types, but only non-empty cells are counted.
=COUNTA(A1:A5) would equal 4 if cells A1:A5 contained , 12/12/2001, house, 0, dog.
In other words **A1** is empty and so is not counted while all other cells are.

COUNTBLANK

The COUNTBLANK function is used to count empty cells. It is the opposite of the COUNTA function
Syntax
COUNTBLANK(**range**)
The COUNTBLANK function takes 1 argument and this argument should be a reference to a range. Cells within the range can be a variety of data types, but only empty cells are counted
=COUNTBLANK(A1:A5) would equal 1 if cells A1:A5 contained , 12/12/2001, house, 0, dog
In other words **A1** is empty and so is counted while all other cells are not.

COUNTIF

The COUNTIF function is used to count cells within a range that meet a specified criterion.
Syntax
COUNTIF(**range,criteria**)
The COUNTIF function takes two (2) arguments. The **range** argument is a reference to a range of cells, while the **criteria** argument is the criterion that should be met by the cells within range before they are counted. The criteria specified can be in the form of a number, text or an expression.
Number criteria
=COUNTIF(A1:A5,20) would equal 1 if cells A1:A5 contained 15, 22, 20, 0, dog
In other words **A3** is the only cell that meets the criteria of **20**
Text criteria
=COUNTIF(A1:A5,"dog") would equal 1 if cells A1:A5 contained 15, 22, 20, 0, dog
In other words **A5** is the only cell that meets the criteria of "**dog**"
Expression criteria
=COUNTIF(A1:A5,"<20") would equal 2 if cells A1:A5 contained 15, 22, 20, 0, dog.
In other words **A1** and **A4** are the only cells that meets the criteria of "**<20**".

MAX

The MAX function is used to return the largest number from a set of values.
Syntax
MAX(**number1**,number2,...)
The MAX function takes up to 30 arguments and will ignore text.
=MAX(A1:A5) would equal 10 if cells A1:A5 contained 9, 8, house, 10, -10

MIN

Opposite to Max, the MIN function is used to return the smallest number from a set of values.

Syntax

MIN(**number1**,number2,...)
The MIN function takes up to 30 arguments and will ignore text.
=MIN(A1:A5) would equal 1 if cells A1:A5 contained 9, 8, house, 10, 1.

SUMIF

The SUMIF function is used to return the sum value from a specified range that meets a criterion.

Syntax
SUMIF(**range,criteria**,sum_range)

The SUMIF takes up to 3 arguments. The **range** is the range of cells to evaluate to see if they meet the specified criteria. The criteria specified can be in the form of a number, text or an expression. The **sum_range** is the range of cells to sum, but only if the corresponding cells in the range meet the specified criteria. If **sum_range** is omitted then the cells within the range are summed.
=SUMIF(A1:A5,5) would equal 10 if cells A1:A5 contained 5, 8, house, 10, 5
In other words cells **A1** and **A5** would be summed as they meet the criteria and NO **sum_range** was supplied.
=SUMIF(A1:A5,5,B1:B5) would equal 20 if cells A1:A5 contained 5, 8, 1, 9, 5 and cells B1:B5 contained 10,1,3,8,10.

In other words cells B1 and B5 would be summed as the corresponding cells in A1:A5 have a value of 5.
=SUMIF(A1:A5,"Cat",B1:B5) would equal 15 if cells A1:A5 contained Cat, cat, Cat, 9, 5 and cells B1:B5 contained 5,5,5,8,11

In other words cells B1,B2 and B3 would be summed as the corresponding cells in A1:A5 contain the text "Cat" (not case sensitive).
=SUMIF(A1:A5,">5") would equal 34 if cells A1:A5 contained 10, 15, Cat, 9, 5 and In other words cells A1 and A5 would be summed as they meet the criteria of being greater than 5.

20) WORKSHEET PROTECTION

Worksheet protection is a very valuable and useful tool, but using it can sometimes seem a little confusing, as there are actually two separate processes that must be followed to protect data.
The first step is to unlock any cells that will require editing. The second step is to apply Worksheet Protection.
Enabling Worksheet Protection
Let's have a look at how we would apply Worksheet protection to the file ABC**.xls** that we used previously, and how we would unlock the **December** figures for each Department, so that they can type their own figures in there.
As a default, all cells within Excel are locked by default. However, you can still change or edit these cells because the Worksheet or Workbook is unprotected. The first step to using data protection is to unlock the cells that need to be changed when we apply Worksheet Protection.
Open the file ABC**.xls** if it is not already open.
If you need to, move your pie chart out of the way using the technique described above so that you can see the range **M3:M6**.
Highlight the range **A3:A6** with your mouse, then go to **Format>Cells** which will display the **Format Cells** dialog box, and select the **Protection** tab.
You have two options within this box. The first option **Locked**, if selected, will prevent a user from changing, moving, resizing or deleting the selected cells. The second option **Hidden**, if selected, will hide the formulas within your Worksheet so that if a cell containing a formula is selected, you will not be able to see what the formula is in the formula bar. Let's select the **Locked** option until it appears without a tick., then click on **OK** to unlock our selected cells (M3:M6).

Now we have unlocked our cells, we can apply **Worksheet Protection** to our data.
Select **Tools>Protection/Protect Sheet** and the **Protect Sheet** dialog box will appear.
Depending on which version of Excel you are using, the options may be slightly different in the Protect Sheet dialog. We do not wish to use a password at this stage, and we will just accept the defaults as they are in this case, so just click **OK**.
OK, let's have a go at using our protected Worksheet.
Click in cell **L3** and type the number **1234**. You will notice that as soon as you start to type, Excel will display a message that tells you the cell or chart you are trying to change is protected and therefore read-only.
Now click in cell **M3** and type **1234**, then Enter. This time your entry will be allowed, as would any entry that you typed in **M4, M5,** or **M6**.
You will note that when you make a change to either M3, M4, M5, or M6, that the formula in M7 will update. This is because locked cells that contain formulas will still change in accordance with the data that is used to calculate them.

Disabling Worksheet Protection

You can unprotect a Worksheet in the same way that you protected it in the first place.
Go to **Tools>Protection**.
As the Worksheet is already protected, your sub-menu will contain a command to unprotect your Worksheet, so let's select **Unprotect Sheet**.
OK, so we have looked now at Worksheet Protection. However anyone with a working knowledge of Excel, could figure out how to unprotect a sheet if they wanted to, so Excel offers you the ability to use a password to protect your Sheet. Passwords are case-sensitive. One thing you MUST be aware of when using a password is that if you lose or forget your password, it cannot be recovered, so it might be a good idea to write down your passwords somewhere and the Worksheets that they relate to and store them in a safe place. It is also a good idea when using a password to use a combination of letters, numbers and symbols.
Select **Tools>Protection/Protect Sheet**.
Click in the **Password** box and type in the word **password** then click **OK**.
Excel will ask you to confirm your password by retyping it, so lets retype in the word password then select **OK**.
Now click in **N3** and type in **1234** as before you cannot make a change here, and a message box will pop up telling you so.
Now click in **M3** and type in **5678** and click **Enter**. As before, no warning will appear and you are able to change cell **M3**.
Let's try and unprotect our sheet now.
Select **Tools>Protection/Unprotect Sheet**.
You must now type in the correct password for your sheet to be unprotected. Type in the word **passwording**, then click on **OK**.
You will get an error message from Excel advising you that the password that you typed is incorrect. You will also get a hint from Excel, that maybe the caps lock key could be on, just in case you have typed the right password in the wrong case.
Click on **OK** and we will try again.
Select **Tools>Protection/Unprotect Sheet** and type in the correct password (**password**).
Select **OK** and your Worksheet will now be unprotected again.
So remember, if you want to use the **Protect** facility, you must remember to **unlock** the cells that you wish to be changed before your apply sheet protection. You can protect a Worksheet with or without a password, but remember that the password does not prevent access to the data, but instead prevents the worksheet being unprotected. Once the protection system is in place, it is impossible for a user to edit, change or delete the contents of a locked cell.

21) Conditional Formatting

Conditional formatting permits the user to apply special formatting settings that take effect when the contents of the cell meet specified conditions. For instance, if there is a loss under a particular head, you intend to color it red so that it immediately catches your attention. Similarly, you may like to color your balance sheet totals to blue if they do not tally. One very practical tip is to combine the ISERROR function with the Conditional Formatting feature to hide errors. What is effectively done is that the font and the background is set to the same color if the cell contains an error.

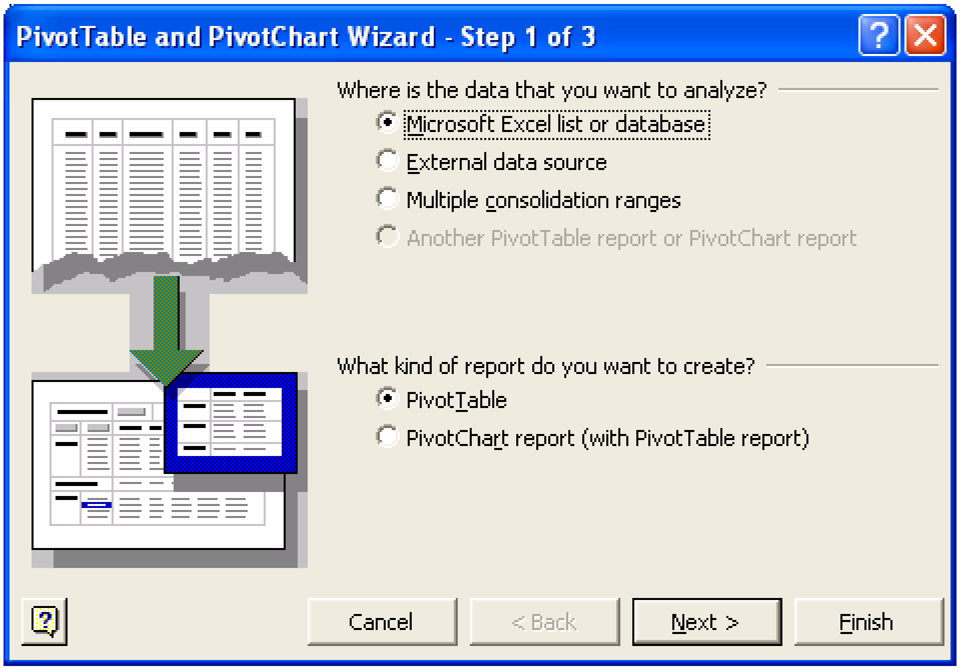
Select the range of cells for which the formatting is desired
Choose Format -> Conditional Formatting
Allows different forms of formatting based on the cell contents
Maximum of 3 different conditions can be specified
To suppress errors, choose Formula is =ISERROR() and then choose same color font as the background color

22) Pivot Tables

PivotTable is a very powerful analysis tool built into MS-EXCEL. It helps in analyzing & summarizing large collections of data. Such data can be derived from various sources. The most common choice is to however create a pivot table from an Excel list. For the purpose of understanding, the following Excel list consisting of time sheet records of a professional firm is analysed using PivotTables

Creating a Pivot Table

For creating a PivotTable, choose the PivotTable command from the Data menu. The PivotTable wizard appears and takes you through the process of creating a PivotTable

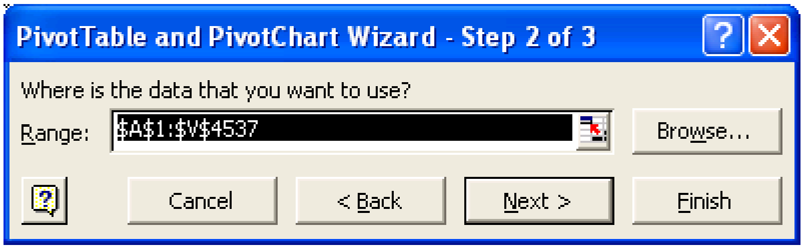


PivotTable and PivotChart Wizard - Step 1 of 3

Where is the data that you want to analyze?
● Microsoft Excel list or database
○ External data source
○ Multiple consolidation ranges
○ Another PivotTable report or PivotChart report

What kind of report do you want to create?
● PivotTable
○ PivotChart report (with PivotTable report)

Step1: Specify the Data Source: Here we specify either an existing Excel list or an external source of data. We also specify whether we want to create a PivotTable or a PivotChart report. The default choices are generally Excel list and PivotTable. Choose Next to specify the data range.

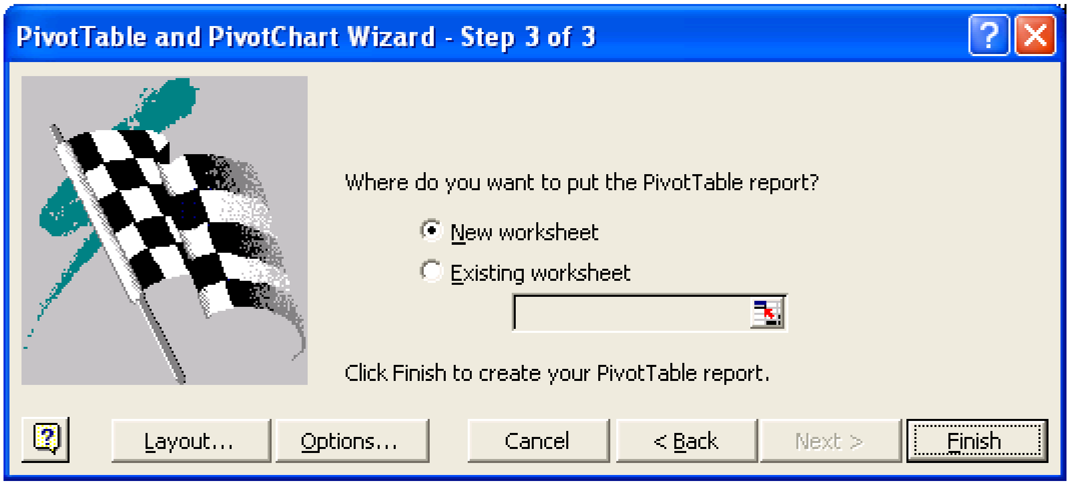

PivotTable and PivotChart Wizard - Step 2 of 3

Where is the data that you want to use?

Range: $A$1:$V$4537

Browse...
Cancel
< Back
Next >
Finish

Step 2: Define the Data Range: Ensure that the correct range of cells has been included. Click the next button to specify the location of the PivotTable


PivotTable and PivotChart Wizard - Step 3 of 3

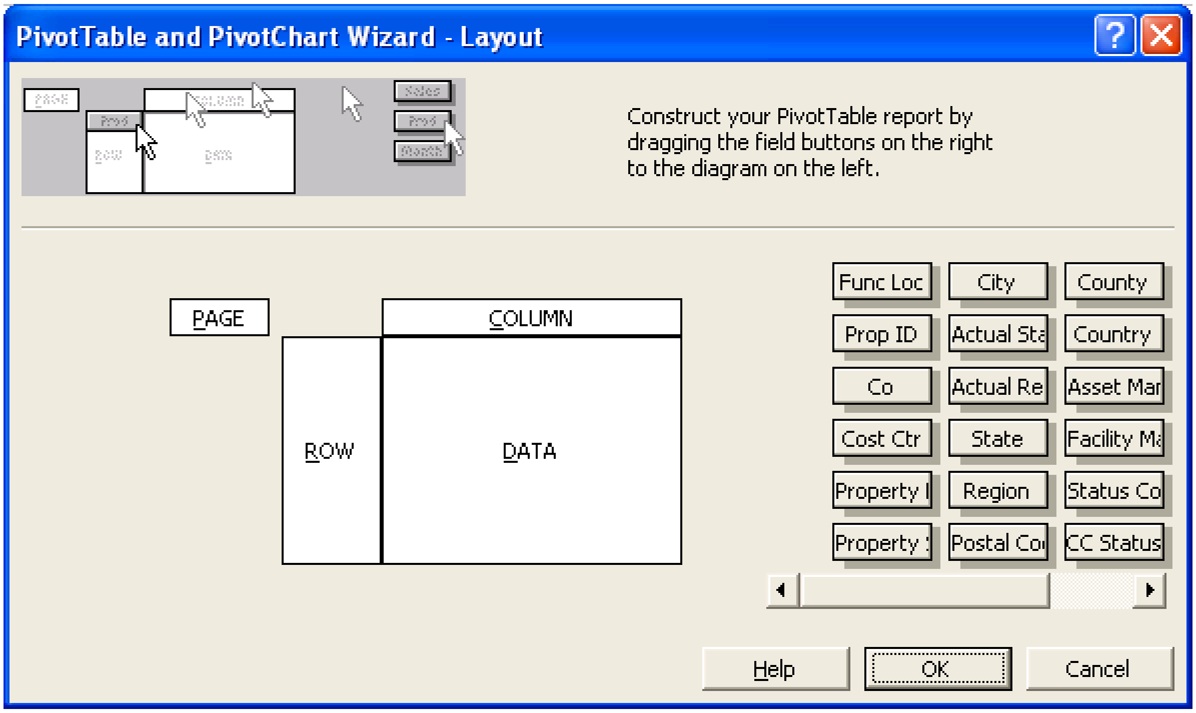
Where do you want to put the PivotTable report?

● New worksheet
○ Existing worksheet

Click Finish to create your PivotTable report.

Layout...
Options...
Cancel
< Back
Next >
Finish

Step 3: Click on Layout. At this stage, it is necessary to understand certain terms relevant for the purposes of PivotTables. For effective analysis, PivotTable uses the concepts of row & column fields for summarizing and grouping data. The page field could be used to filter out the data on a particular item. The data field contains the summary information. To create the analysis, drag the desired item from the PivotTable Field list and drop it in the relevant section of the main table.

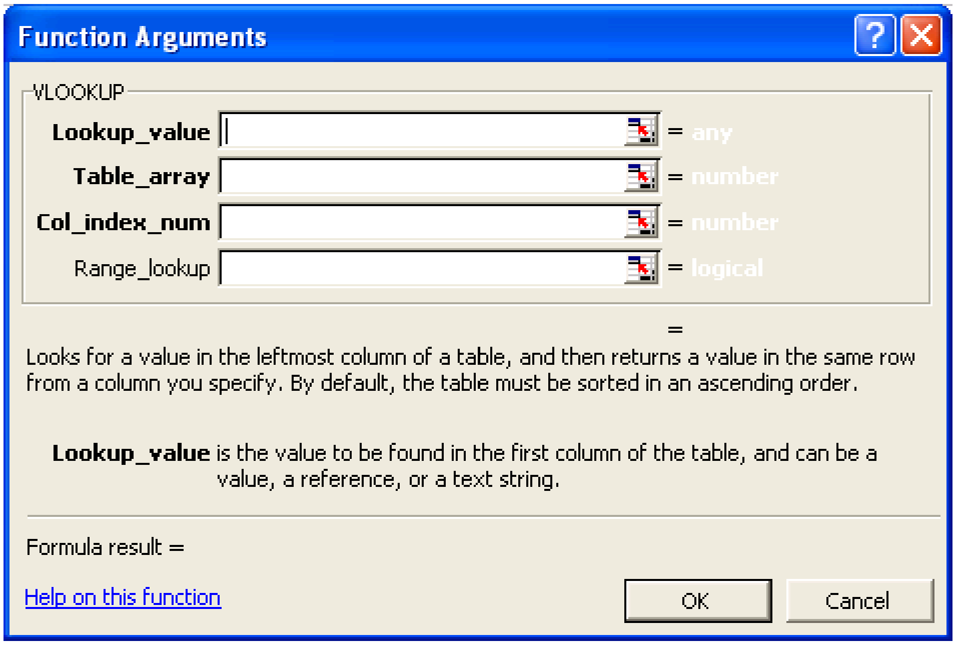

PivotTable and PivotChart Wizard - Layout

Construct your PivotTable report by dragging the field buttons on the right to the diagram on the left.

PAGE
COLUMN
ROW
DATA
Func Loc
City
County
Prop ID
Actual Sta
Country
Co
Actual Re
Asset Mar
Cost Ctr
State
Facility M
Property I
Region
Status Co
Property
Postal Co
CC Status
Help
OK
Cancel

23) Vlookup

In Excel, the **VLookup** function searches for value in the left-most column of *table_array* and returns the value in the same row based on the *index_number*.
The syntax for the **VLookup** function is:
VLookup(value, table_array, index_number, not_exact_match)
value is the value to search for in the first column of the *table_array*.
table_array is two or more columns of data that is sorted in ascending order.



Lookup_value = any
Table_array = number
Col_index_num = number
Range_lookup = logical

Looks for a value in the leftmost column of a table, and then returns a value in the same row from a column you specify. By default, the table must be sorted in an ascending order.

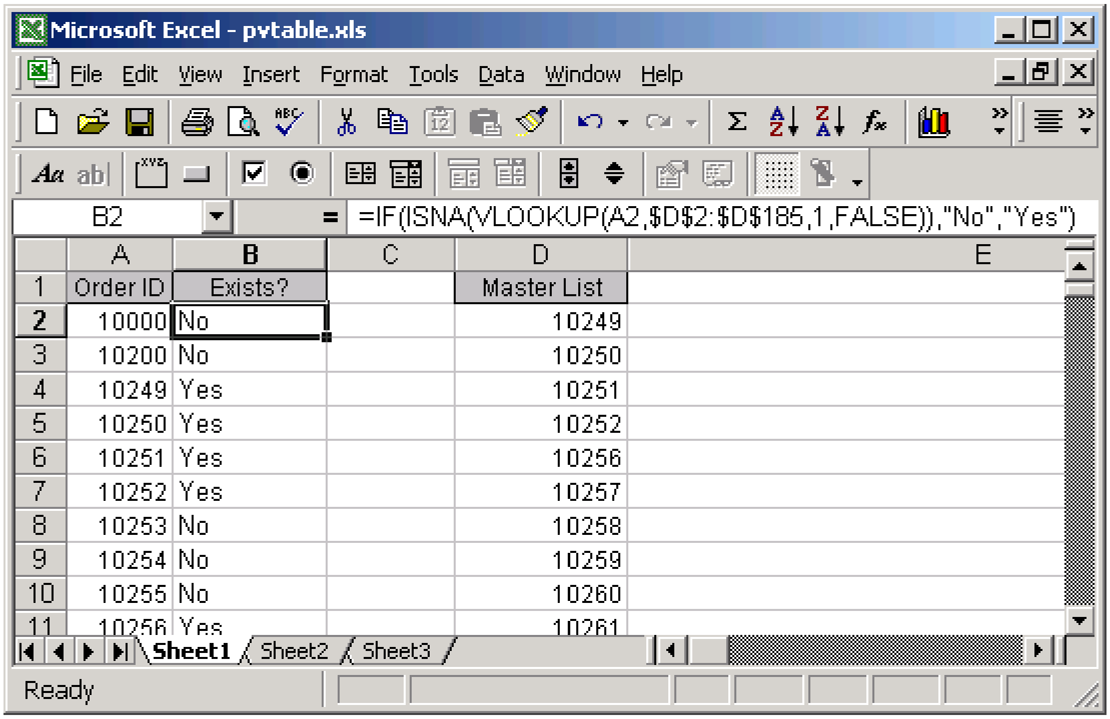
Lookup_value is the value to be found in the first column of the table, and can be a value, a reference, or a text string.

Formula result =

index_number is the column number in table_array from which the matching value must be returned. The first column is 1.
not_exact_match determines if you are looking for an exact match based on value. Enter FALSE to find an exact match. Enter TRUE to find an approximate match, which means that if an exact match if not found, then the VLookup function will look for the next largest value that is less than value.
Note:
If index_number is less than 1, the VLookup function will return #VALUE!.
If index_number is greater than the number of columns in table_array, the VLookup function will return #REF!.
If you enter FALSE for the not_exact_match parameter and no exact match is found, then the VLookup function will return #N/A.

To perform mathematical operations on your VLookup results, you need to replace the #N/A error with a 0 value (or something similar). This can be done with a formula that utilizes a combination of the VLookup function, **IF function, and ISNA function.**

=IF(ISNA(VLOOKUP(E2,$A$2:$C$5,3,FALSE)),0,VLOOKUP(E2,$A$2:$C$5,3,FALSE)) would return 0
First, you need to enter a FALSE in the last parameter of the VLookup function. This will ensure that the VLookup will test for an exact match.
If the VLookup function does not find an exact match, it will return the #N/A error. By using the IF and ISNA functions, you can return the Unit Price value if an exact match is found. Otherwise, a 0 value is returned. This allows you to perform mathematical operations on your VLookup results.


Microsoft Excel - pvtable.xls
File Edit View Insert Format Tools Data Window Help
Sheet1
Sheet2
Sheet3
Ready

B2 =IF(ISNA(VLOOKUP(A2,$D$2:$D$185,1,FALSE)),"No","Yes")

	A	B	C	D	E
1	Order ID	Exists?		Master List	
2	10000	No		10249	
3	10200	No		10250	
4	10249	Yes		10251	
5	10250	Yes		10252	
6	10251	Yes		10256	
7	10252	Yes		10257	
8	10253	No		10258	
9	10254	No		10259	
10	10255	No		10260	
11	10256	Yes		10261	

Based on the spreadsheet above:
=IF(ISNA(VLOOKUP(A2,$D$2:$D$185,1,FALSE)),"No","Yes") would return "No"
=IF(ISNA(VLOOKUP(A5,$D$2:$D$185,1,FALSE)),"No","Yes") would return "Yes"
First, you need to enter a FALSE in the last parameter of the VLookup function. This will ensure that the VLookup will test for an exact match.

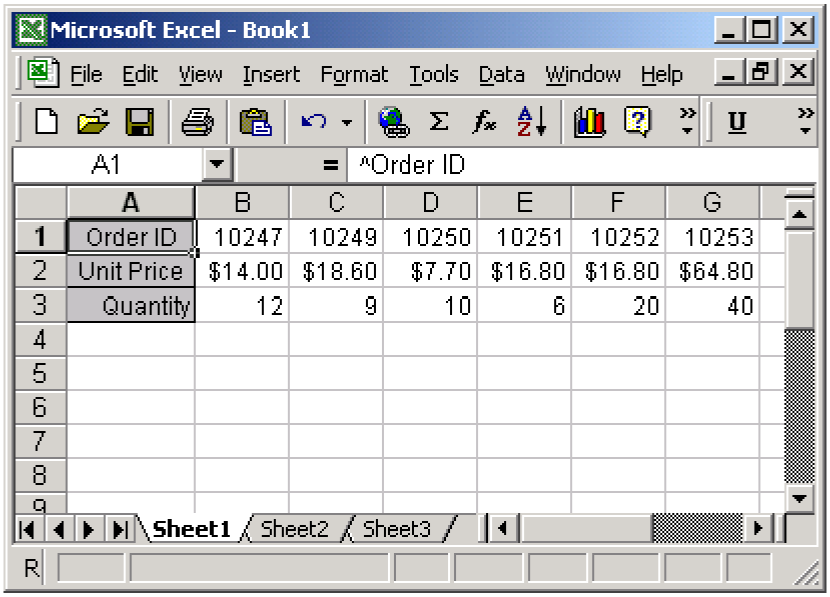
If the VLookup function does not find an exact match, it will return the #N/A error. By using the IF and ISNA functions, you can return a "Yes" value if an exact match is found. Otherwise, a "No" value is returned.

24) HLookup function

It searches for value in the top row of *table_array* and returns the value in the same column based on the *index_number*.
The syntax for the **HLookup** function is:
HLookup(value, table_array, index_number, not_exact_match)
value is the value to search for in the first row of the *table_array*.
table_array is two or more rows of data that is sorted in ascending order.
index_number is the row number in *table_array* from which the matching value must be returned. The first row is 1.
not_exact_match determines if you are looking for an exact match based on *value*. Enter FALSE to find an exact match. Enter FALSE to find an approximate match, which means that if an exact match if not found, then the HLookup function will look for the next largest value that is less than *value*.

Note:
If *index_number* is less than 1, the HLookup function will return #VALUE!.
If *index_number* is greater than the number of columns in *table_array*, the HLookup function will return #REF!.
If you enter FALSE for the *not_exact_match* parameter and no exact match is found, then the HLookup function will return #N/A.

For example:
Let's take a look at an example:



	A	B	C	D	E	F	G
1	Order ID	10247	10249	10250	10251	10252	10253
2	Unit Price	$14.00	$18.60	$7.70	$16.80	$16.80	$64.80
3	Quantity	12	9	10	6	20	40

Based on the Excel spreadsheet above:

=HLookup(10251, A1:K3, 2, FALSE)	would return $16.80
=HLookup(10251, A1:K3, 3, FALSE)	would return 6
=HLookup(10248, A1:K3, 2, FALSE)	would return #N/A
=HLookup(10248, A1:K3, 2, TRUE)	would return $14.00

25) Using Charts in Excel

What is a Chart?

A chart is a graphic representation of worksheet data. Presenting information in the form of a chart is often one of the best ways to analyze data as well as call attention to specific entries.

With Excel, you can create several different types of charts. Each type, in turn, can be displayed in a number of different subtypes. Some of the most common chart types include:

Column	In a Column chart, vertical bars represent values.
Bar	In a Bar chart, horizontal bars represent values.
Cylinder	In a Cylinder chart, vertical or horizontal cylinders represent values.
Line	In a Line chart, points on a line represents values.
Scatter	In a Scatter chart, two sets of values are represented by points (usually on two lines).
Area	In an Area chart, shaded areas represent values.

Pie	In a Pie chart, values are represented by slices of a pie (percentages of the whole).

Plotting a basic chart…

With Excel's Chart Wizard, you can quickly plot a basic chart—that is, a chart containing data markers, a title and a legend. The chart can appear on the worksheet containing the source data or it can appear on a separate chart sheet of its own.

Objective 1: Create a Chart
To Create a Chart using the Chart Wizard

Highlight the data you want to chart, including any headers or labels
Click the **Chart Wizard button** on the Standard toolbar

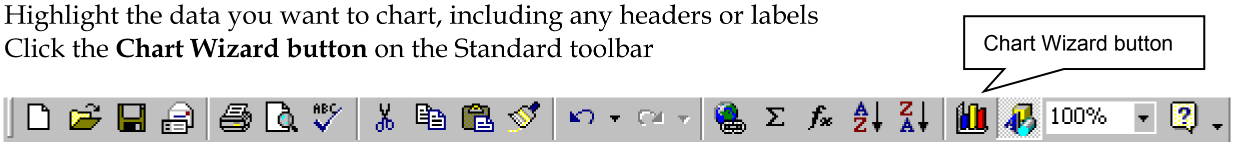


Chart Wizard button

From the **Chart type list**, click type of chart you wish to create
From the **Chart sub-type list**, click the sub-type you wish to use
Click the **Next button**

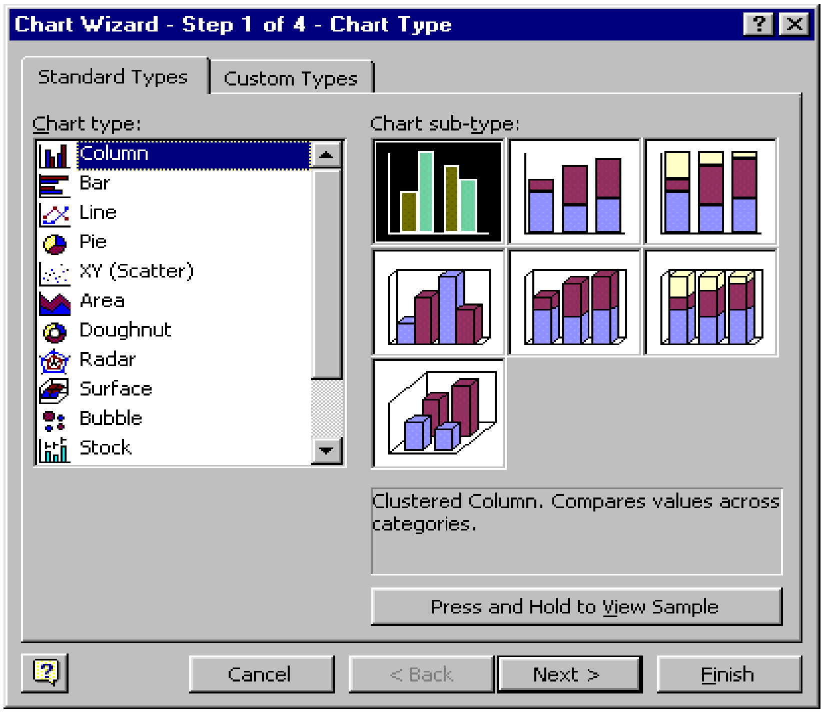


Chart Wizard - Step 1 of 4 - Chart Type
Standard Types
Custom Types
Chart type:
Column
Bar
Line
Pie
XY (Scatter)
Area
Doughnut
Radar
Surface
Bubble
Stock
Chart sub-type:
Press and Hold to View Sample
Cancel
< Back
Next >
Finish

Clustered Column. Compares values across categories.

Objective 2: The Chart Source Dialog box.

Lets you choose the data being charted and whether the series are in rows or columns. If you selected the data before clicking the Chart Wizard button, Excel converted the range to absolute values and the correct range displays in the Data range text box.

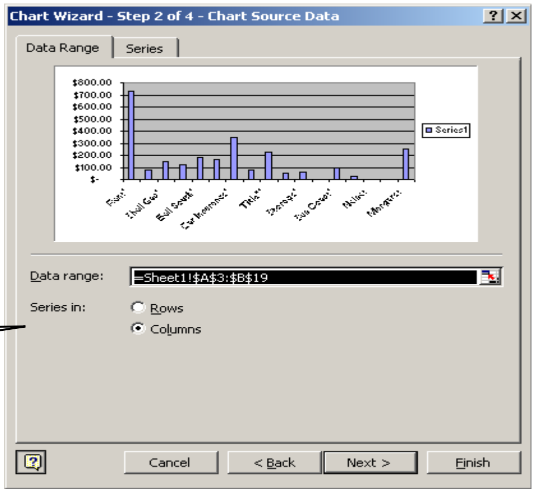


Chart Wizard - Step 2 of 4 - Chart Source Data
? ×
Data Range
Series
$800.00
$700.00
$600.00
$500.00
$400.00
$300.00
$200.00
$100.00
$-
Series1
Cancel
< Back
Next >
Finish

Data range: =Sheet1!$A$3:$B$19

Series in: ○ Rows ● Columns

Shows Data Range selected.
Series are shown in columns.

Note: By selecting the Series tab, you can change the title of Default Series to specific series names

Click the **Series** Tab
Under the **Series** dialog box, Select the Series that you would like to change
Click into the **Name** Dialog box and type the new name for the Series
Add or Remove Series names by selecting the buttons located under the **Series** dialog box
Click **Next**

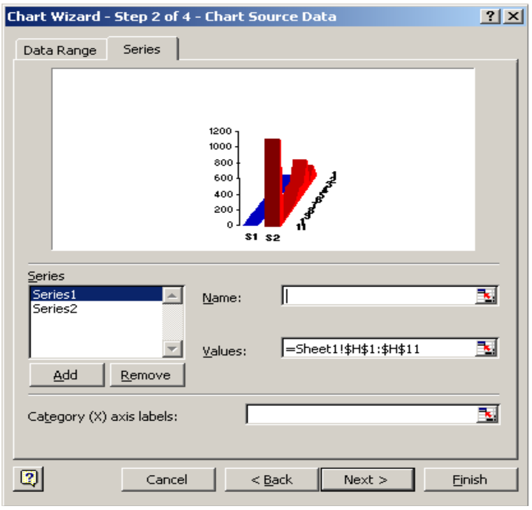


Chart Wizard - Step 2 of 4 - Chart Source Data
? ×
Data Range
Series
1200
1000
800
600
400
200
0
S1
S2
Add
Remove
Cancel
< Back
Next >
Finish

Series: Series1, Series2

Name:

Values: =Sheet1!$H$1:$H$11

Category (X) axis labels:

Objective 3: The Chart Options Dialog Box

This dialog box shows a sample chart using the data you selected. Here, you can choose to keep the legend, add a chart title, gridlines, data labels, data table, and add axis titles.

Shows new Series names

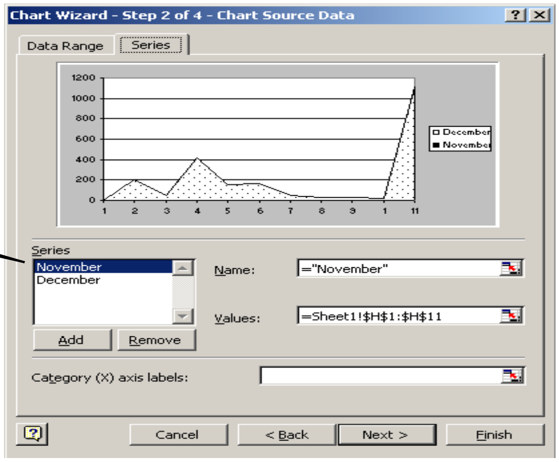


Chart Wizard - Step 2 of 4 - Chart Source Data
? ×
Data Range
Series
1200
1000
800
600
400
200
0
1
2
3
4
5
6
7
8
9
1
11
December
November
Add
Remove
Cancel
< Back
Next >
Finish

Series: November, December

Name: ="November"

Values: =Sheet1!$H$1:$H$11

Category (X) axis labels:

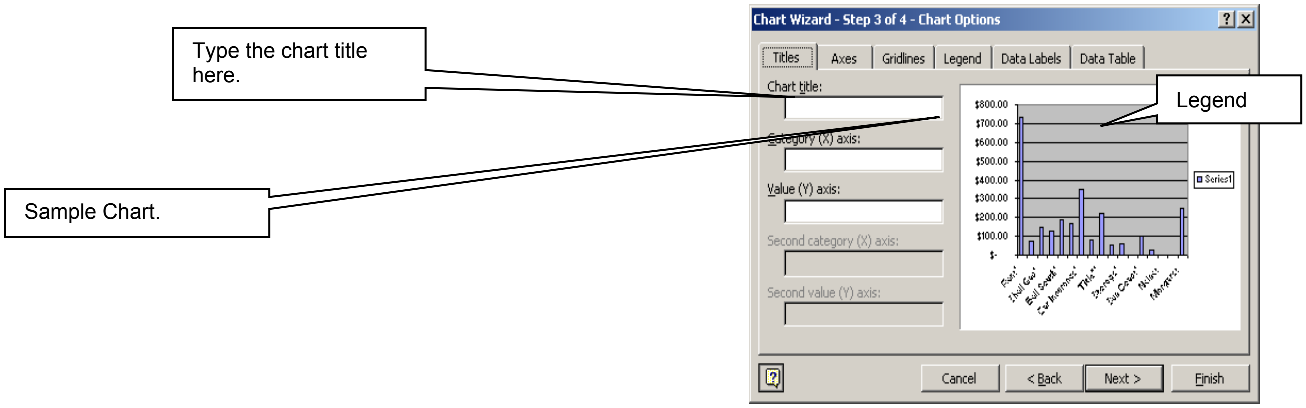


Chart Wizard - Step 3 of 4 - Chart Options
Titles
Axes
Gridlines
Legend
Data Labels
Data Table
Chart title:
Category (X) axis:
Value (Y) axis:
Second category (X) axis:
Second value (Y) axis:
$800.00
$700.00
$600.00
$500.00
$400.00
$300.00
$200.00
$100.00
$-
Series1
Cancel
< Back
Next >
Finish

Type the chart title here.

Sample Chart.

Legend

Click Next,

Objective 4: Chart Location Dialog Box

In the Chart Wizard, Step 4 of 4, you determine the placement of the chart in the workbook. You can display a chart as an object on the current sheet, on any other existing sheet, or on a newly created chart sheet.

Click the **Radio Button** for your choice

Click **Finish**

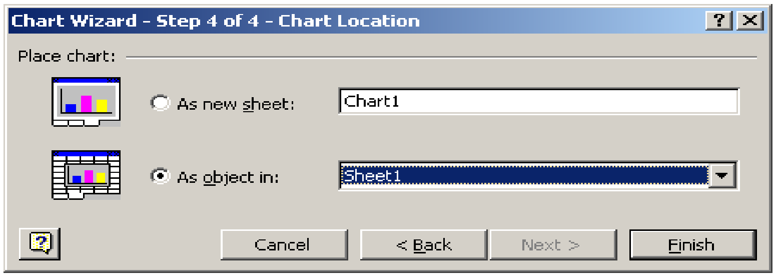


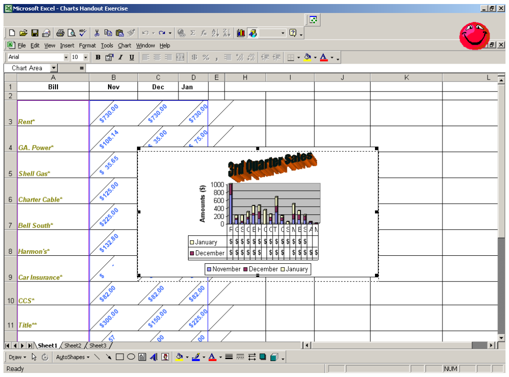
Chart Wizard - Step 4 of 4 - Chart Location
Place chart:
Cancel
< Back
Next >
Finish

○ As new sheet: Chart1

● As object in: Sheet1

Objective 5: Moving & Resizing a Chart

Click the Chart to Select it
Click, Hold, and Drag the chart to the desired position until it docks
Release the left mouse button
Click the legend to select it
Drag the legend until it is aligned with the plot area.


Microsoft Excel - Charts Handout Exercise
Chart Area
Bill
Nov
Dec
Jan
Rent*
GA. Power*
Shell Gas*
Charter Cable*
Bell South*
Harmon's*
Car Insurance*
CCS*
Title**
3rd Quarter Sales
Amounts ($)
January
December
November
Sheet1
Sheet2
Sheet3
Ready
NUM

Objective 6: Editing & Enhancing a Chart

Once you have created a chart, it's easy to modify it to make it easier to read and understand. You can create titles for the x-axis and y-axis, add graphics, add background color, or format the text you use in a chart.

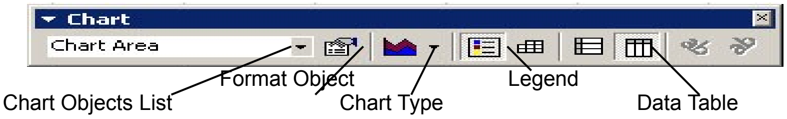


Chart
Chart Area
Format Object
Chart Objects List
Chart Type
Legend
Data Table

Make sure your Chart is selected
Click **Chart** from the Chart Main Menu or Use the Chart Toolbar **View, Toolbars, Chart**
Click Chart **type**
Click a **Chart sub-type**
Click the **Press and Hold to View Sample** button to preview selection
Click **OK**
Click **Chart** from the Main Menu
Click **Chart Options**

Click **Titles tab** in the Chart Options dialog box, then type a title in the Category (X) axis box
Click the **Value (Y) axis text box,** type a title, then click **OK**
Press **ESC** to deselect the Value-axis title
Click the **Chart Title** to select it
Click the **Format Chart Title button** on the Chart toolbar to open the Format Chart Title dialog (If Chart toolbar is not present, Go to **View, Toolbars, Chart)**
Make sure the **Patterns tab** is selected, and then click the **Shadow checkbox**.

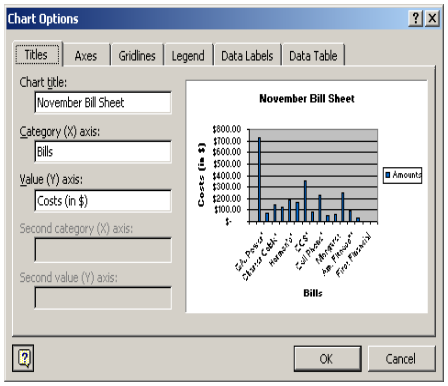
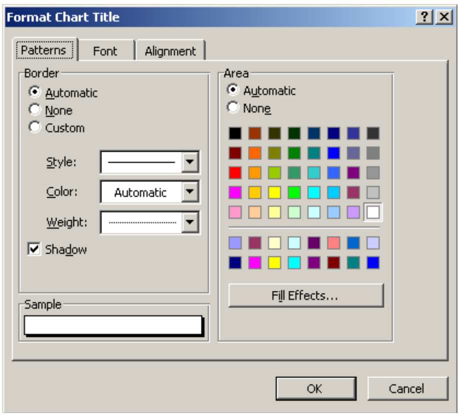


Chart Options
Titles
Axes
Gridlines
Legend
Data Labels
Data Table
November Bill Sheet
$800.00
$700.00
$600.00
$500.00
$400.00
$300.00
$200.00
$100.00
$-
Costs (in $)
Amounts
Bills
Second category (X) axis:
Second value (Y) axis:
OK
Cancel

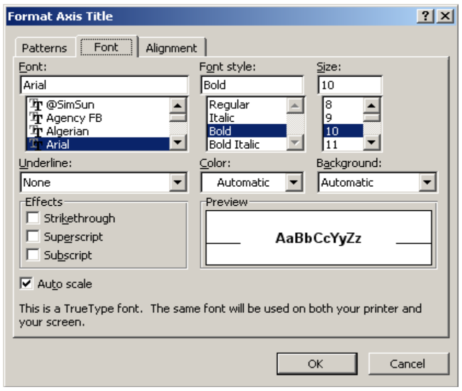
Chart title: November Bill Sheet
Category (X) axis: Bills
Value (Y) axis: Costs (in $)

Click the **Font tab** in the **Format Chart Title** dialog box, make changes, Click **OK**
Click the **Category Axis Title,** Click the **Format Object button,** click the **Font** tab, make changes to the Font selection and/or Font Sizes, Click the **Alignment** tab, then go to the **Orientation** tab to adjust the text, then click **OK**


Format Chart Title
Patterns
Font
Alignment
Border
Automatic
None
Custom
Style:
Color:
Weight:
Shadow
Sample
Area
Automatic
None
Fill Effects...
OK
Cancel

Border: ● Automatic ○ None ○ Custom
Color: Automatic
☑ Shadow
Area: ● Automatic ○ None

Click the **Value Axis Title,** Click the **Format Object button,** Click the **Font** tab**,** make changes to the Font selection and/or Font Sizes, Click the **Alignment** tab, then go to the **Orientation** tab to adjust the text, Click **OK,** then press **[ESC]** to deselect the title

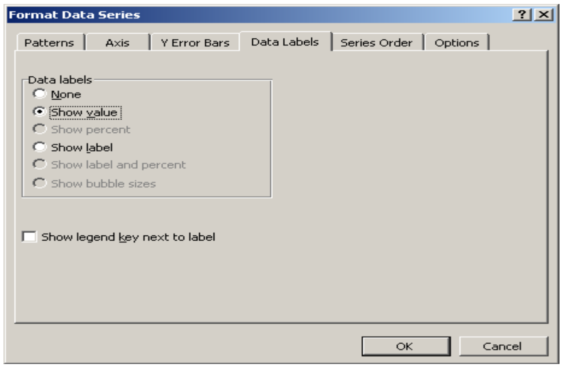

Format Axis Title
Patterns
Font
Alignment
@SimSun
Agency FB
Algerian
Arial
Regular
Italic
Bold
Bold Italic
8
9
10
11
Effects
Strikethrough
Superscript
Subscript
Preview
AaBbCcYyZz
OK
Cancel

Font: Arial
Font style: Bold
Size: 10
Underline: None
Color: Automatic
Background: Automatic
☐ Strikethrough
☐ Superscript
☐ Subscript
☑ Auto scale

This is a TrueType font. The same font will be used on both your printer and your screen.

Objective 7: Customizing a Data Series

A **data series** is the information, usually numbers or values that Excel plots on a chart. You can customize the data series in a chart easily by altering the spreadsheet range that contains the chart data or by entering descriptive text, called a **data label** that appears above a data marker in a chart.


Format Data Series
Patterns
Axis
Y Error Bars
Data Labels
Series Order
Options
OK
Cancel

Data labels
○ None
● Show value
○ Show percent
○ Show label
○ Show label and percent
○ Show bubble sizes

☐ Show legend key next to label

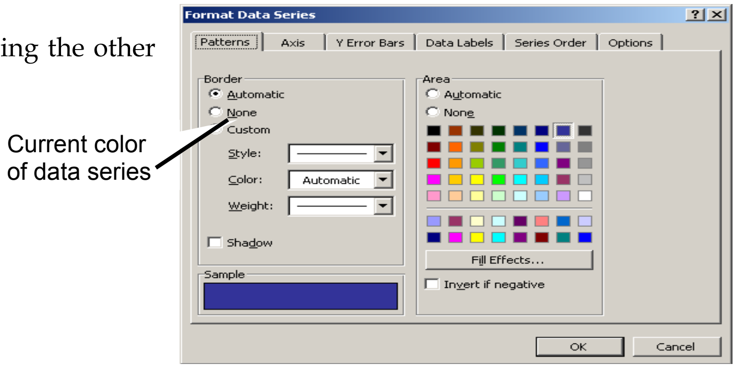
If necessary, Click the **Chart** to select it
Click the **Chart Objects list arrow** in the Chart toolbar, then click Series
Click the **Format Object button** on the Chart toolbar,
Click the **Data Labels tab** in the Format Data Series dialog box
Under Data Labels, click the **Show value** and/or **Show label** option button to select it then click **OK.**

Click the **Chart Objects list arrow** on the Chart toolbar, click a **Series**, click the **Format Object button,** then click the **Patterns tab** in the Format Data Series dialog box.

Area choices of color

Under Area, click a color choice, click **OK,** press **[ESC}** to deselect the data series, press **[ESC]** again to deselect the entire chart.

Format other **Data Series** options by selecting the other tabs


Format Data Series
Patterns
Axis
Y Error Bars
Data Labels
Series Order
Options
Border
Custom
Style:
Weight:
Sample
Area
Fill Effects...
OK
Cancel

Border: ● Automatic ○ None
Color: Automatic
☐ Shadow
Area: ○ Automatic ○ None
☐ Invert if negative

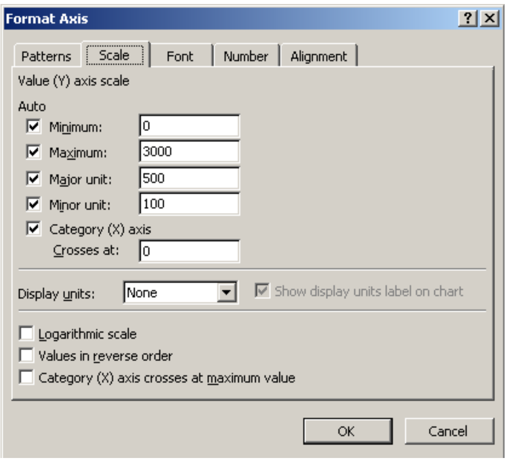
Current color of data series

Objective 8: Formatting a Chart Axis

Excel automatically plots and formats all chart data and places chart axes within the chart's **plot area.** Data values in two-dimensional charts are plotted on the value (y) axis and categories are plotted on the category (x) axis. You can override any of these settings by following these steps.

Click the **Chart,** click the **Chart Objects list arrow** on the Chart toolbar, then click **Value Axis.**
Click the **Format Object button** on the Chart toolbar, then click the **Scale tab**

Note: The check marks under Auto indicate the default scale settings. You can override any of these settings by entering a new value.
In the boxes, type desired values for Maximum, Minimum, and Increment units, then click **OK.**
With the **Value Axis** still selected, click **Format Object button** on the Chart toolbar, then click the **Number tab**
Under Category click **General,** click **OK,** press **[Esc]** twice


Format Axis
Patterns
Scale
Font
Number
Alignment
OK
Cancel

Value (Y) axis scale
Auto
☑ Minimum: 0
☑ Maximum: 3000
☑ Major unit: 500
☑ Minor unit: 100
☑ Category (X) axis
Crosses at: 0
Display units: None
☑ Show display units label on chart
☐ Logarithmic scale
☐ Values in reverse order
☐ Category (X) axis crosses at maximum value

Value (z) axis with scale

Objective 9: Adding a Data Table to a Chart

A **data table,** attached to the bottom of a chart, is a grid containing the chart data. Data tables are useful because they highlight the data used to generate a chart, which might otherwise be difficult to find. They can be displayed in line, area, column, and bar charts, and print automatically along with a chart.

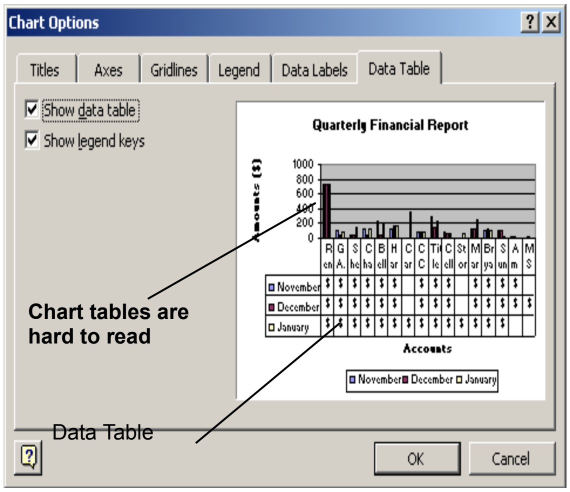


Chart Options
Titles
Axes
Gridlines
Legend
Data Labels
Data Table
Quarterly Financial Report
Amounts ($)
1000
800
600
400
200
0
November
December
January
Accounts
OK
Cancel

☑ Show data table
☑ Show legend keys

Chart tables are hard to read

Data Table

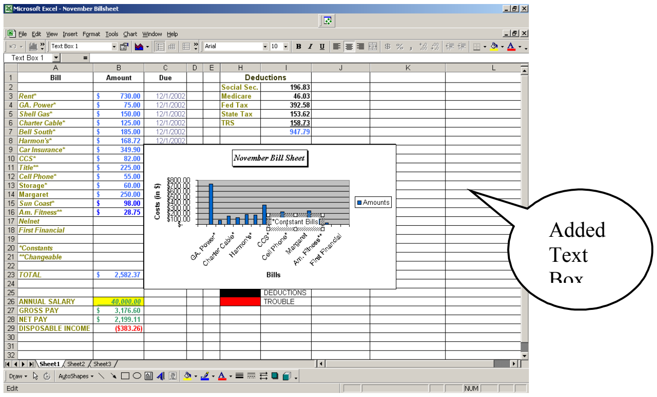
Click the **Chart** to select it, click **Chart** on the menu bar, click **Chart Options,** then click the **Data Table tab**
Click the **Show data table check box** to select it
Click **OK,** then, if necessary, scroll down to display the chart

If necessary, click the **chart** to select it, click **Chart** on the menu bar, click **Location,** click the **As new sheet** option button under **Place chart**, click **OK**

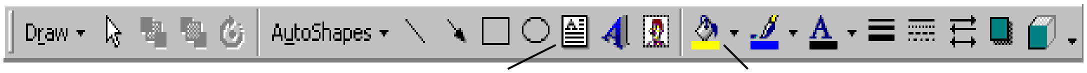
Objective 11: Annotating and Drawing on a Chart

You can add arrows and text annotations to point out critical information in your charts.

Select your chart, if necessary.
Type new text in the formula bar (after you confirm the entry, the text appears in a selected text box within the chart window).
Point to an edge of the text box so the pointer changes to a 4-way arrow.
Go to the Drawing Toolbar or go to View, Toolbar, ✓ Draw


Microsoft Excel - November Billsheet
File Edit View Insert Format Tools Chart Window Help
Text Box 1
Arial
10
November Bill Sheet
Costs (in $)
$800.00
$700.00
$600.00
$500.00
$400.00
$300.00
$200.00
$100.00
$-
GA. Power*
Charter Cable*
Harmon's*
CCS*
Cell Phone*
Margaret
Am. Fitness**
First Financial
Bills
Amounts
*Constant Bills
Sheet1
Sheet2
Sheet3
Draw
AutoShapes
Edit
NUM
Added Text Box

	A	B	C	H	I
1	Bill	Amount	Due	Deductions	
2				Social Sec.	196.83
3	Rent*	$ 730.00	12/1/2002	Medicare	46.03
4	GA. Power*	$ 75.00	12/1/2002	Fed Tax	392.58
5	Shell Gas*	$ 150.00	12/1/2002	State Tax	153.62
6	Charter Cable*	$ 125.00	12/1/2002	TRS	158.73
7	Bell South*	$ 185.00	12/1/2002		947.79
8	Harmon's*	$ 168.72	12/1/2002		
9	Car Insurance*	$ 349.90			
10	CCS*	$ 82.00			
11	Title**	$ 225.00			
12	Cell Phone*	$ 55.00			
13	Storage*	$ 60.00			
14	Margaret	$ 250.00			
15	Sun Coast*	$ 98.00			
16	Am. Fitness**	$ 28.75			
17	Nelnet				
18	First Financial				
19					
20	*Constants				
21	**Changeable				
22					
23	TOTAL	$ 2,582.37			
24					
25					DEDUCTIONS
26	ANNUAL SALARY	40,000.00			TROUBLE
27	GROSS PAY	$ 3,176.60			
28	NET PAY	$ 2,199.11			
29	DISPOSABLE INCOME	($383.26)			


Draw
AutoShapes

Arrow Button

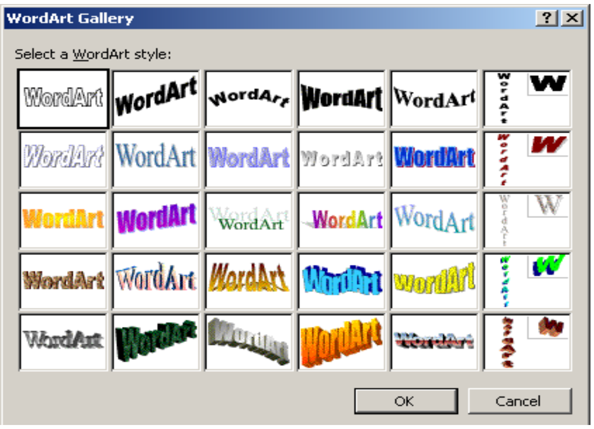
Insert a Word Art

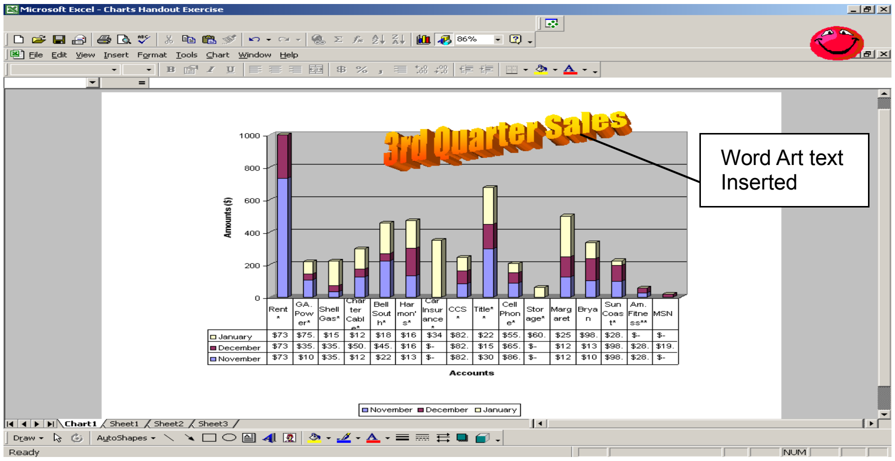
Click the **Arrow button** on the Drawing toolbar (The pointer changes to **+** and the status bar displays "Click and drag to insert an AutoShape." When you draw an arrow, the point farthest from where you start will have the arrowhead.)
Position **+** under your text selection in the text box, press and hold the **left mouse button**
Drag the line to the designated point, then release the mouse button.
Click anywhere to close the Drawing toolbar or

Objective 12: Enhancing a Chart with WordArt

You can enhance your chart or worksheet by adding specially formatted text using the WordArt tool on the Drawing toolbar.

Click the Insert a WordArt button on the Drawing toolbar
Select a WordArt style, Click OK
Type new text, Click the Font selection to change formatting, Click OK
Move & Resize Word Art where you like
Press [Esc] to deselect the WordArt


WordArt Gallery
Select a WordArt style:
OK
Cancel


Microsoft Excel - Charts Handout Exercise
File Edit View Insert Format Tools Chart Window Help
86%
3rd Quarter Sales
1000
800
600
400
200
0
Amounts ($)
Accounts
November December January
Chart1 Sheet1 Sheet2 Sheet3
Draw AutoShapes
Ready
NUM

Word Art text Inserted

	Rent*	GA. Power*	Shell Gas*	Charter Cable*	Bell South*	Harmon's*	Car Insurance*	CCS*	Title**	Cell Phone*	Storage*	Margaret	Bryan	Sun Coast*	Am. Fitness**	MSN
January	$73	$75.	$15	$12	$18	$16	$34	$82.	$22	$55.	$60.	$25	$98.	$28.	$-	$-
December	$73	$35.	$35.	$50.	$45.	$16	$-	$82.	$15	$65.	$-	$12	$13	$98.	$28.	$19.
November	$73	$10	$35.	$12	$22	$13	$-	$82.	$30	$86.	$-	$12	$10	$98.	$28.	$-

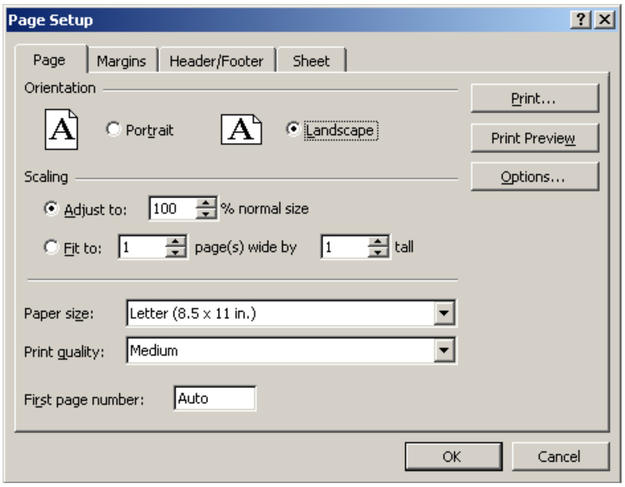
Objective 13: Previewing and Printing a Chart

After you complete a chart to your satisfaction, you will need to print it. Previewing a chart gives you a chance to see what your chart looks like before you print it. You can print a chart by itself, or as a part of the worksheet.

Note: If you want to print only the chart without the date, leave the chart selected.

Print Preview

Click the **Print Preview** button on the Standard toolbar, or go to **File, Print Preview**.
If you want to change the Orientation of the printout…
Click **Setup** on the Print Preview Toolbar
Click the **Page** tab
If necessary, Click the **Landscape** option radio button
Click **OK**
Click the **Print** tab to display the **Print** dialog box, then click **OK**


Page Setup
Page
Margins
Header/Footer
Sheet
Print…
Print Preview
Options…
OK
Cancel

Orientation
○ Portrait ● Landscape

Scaling
● Adjust to: 100 % normal size
○ Fit to: 1 page(s) wide by 1 tall

Paper size: Letter (8.5 x 11 in.)
Print quality: Medium
First page number: Auto

Note: When a chart is selected, you can accurately position a chart on the page by setting the desired margin lines.
Change Margins

From the **Print Preview** Toolbar, Click the **Margins** tab
Press and hold the mouse button on the margin
Drag the lines to the exact setting you want
Click the **Print** tab to display the **Print** dialog box, then click **OK**

26) Establishing Links Between Worksheets or Workbooks

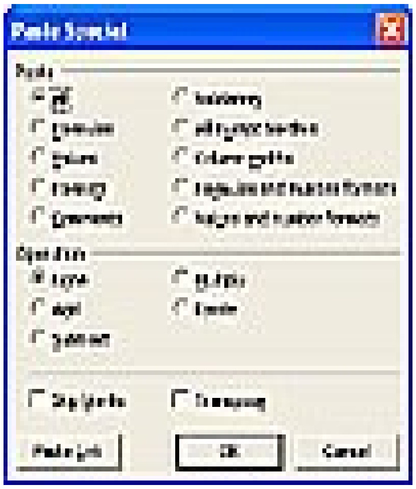
The simple Edit, Paste command places copied content in a new location. Choosing Edit, Paste Special enables you to create a link between the source and target worksheets or workbooks.

NOTE

You can establish one or more links within a single worksheet, enabling you to enter repeated information once and have it update to one or more additional cells automatically.

To copy and link content between worksheets or workbooks in Excel, follow these steps:
When copying between workbooks, be sure both workbooks are open and have been saved.
Select and copy the source content in the source worksheet. This content will become the linked object.
Move to the target worksheet, select the cell where you want the linked data to begin, and choose Edit, Paste Special to open the Paste Special dialog box.

In most cases, use the All option that's selected by default when creating a paste link.



Make any selections pertaining to the content and formatting you want to include in the pasted material. In most cases, the default All selection is exactly what you need.
Click the Paste Link button. Note that this button doesn't open another dialog box, as you might expect. Instead, it immediately executes the link.
After linking a source and target, test the link by switching to the source cells and making a change to their content. Check the target, and see that the change is reflected. When viewing the target, notice that the Formula bar shows the link, listing the source location, as shown in Figure 3.24. The workbook name appears in brackets ([ ]), followed by the worksheet name with an exclamation point (!) and the range name or cell reference.

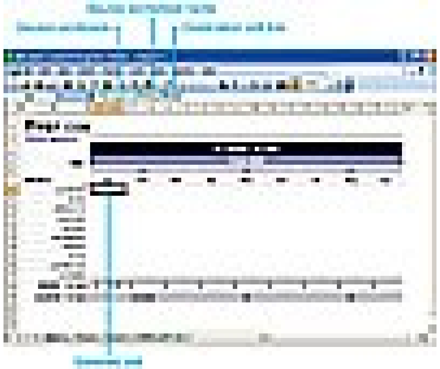
In this example, the link is as follows:
=[Chapt3.xls]Table!D8
The source workbook's name is Chapt3.xls (.xls is the file's extension).
The source worksheet is named TABLE.
The source cell is D8.
If the source workbook is closed, the link formula also includes the full path to the source file.

NOTE

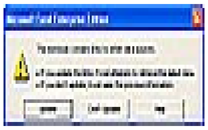
If you paste link blank cells, Excel displays 0 for the blank cell in the target location. To suppress the display of zeros, choose Tools, Options, click the View tab, and deselect the Zero Values option.

Updating Links to a Workbook

When you open a workbook that contains one or more links to other workbooks, you'll be prompted to update the links—that is, update the target to reflect any changes made in the source, as shown in Figure 3.25. You are prompted to update links only when one or more of the source workbooks are closed. If they're all open at the time you open the file containing links, Excel automatically updates the links. If you prefer, you can choose to keep the file's existing content intact and update the links later, as needed.



When a target cell is selected, the Formula bar displays the source filename, sheet name, and cell address.



If you aren't the primary editor of the source document, it might be safer to choose Don't Update, and then check the source document before updating the linked data.

To update a link between two workbooks after the target has been opened, follow these steps:
In the document containing the linked material (the target), choose Edit, Links to display the Links dialog box.
Links can be edited only from within the target document. The Links command is disabled in the Edit menu if you attempt to access it from the source document or any unlinked workbook.

In the Links dialog box, click the link you want to update in the Source File list.

It's a good idea to save the workbook before updating any links. If you regret having updated them, you can close the file without saving.
Click the Update Values button.
Click Close.

TIP
To quickly update all links with one fast keystroke, press F9 in the workbook that contains linked data. Note, however, that this technique is useful only when the following conditions are in place:
The workbook containing the links has calculation set to Manual (choose Tools, Options, click the Calculation tab, and select Manual).
The source workbook is open. Keep in mind that if you've set your calculations to Manual none of the calculations will work unless you press F9.
Locking Linked External Data
Worksheets can occasionally include links to OLE-compatible applications other than Excel. To prevent accidental updates of these links, you can lock the links. Choose Tools, Options to open the Options dialog box, and click the Calculation tab. Remove the check mark in the Update Remote References box. To resume updates in the future, turn the option back on.
Redirecting Links
If you rename a workbook to which other workbooks are linked, the links break. You can repair the broken links by redirecting them to the renamed file. To do so, move to the target document (the workbook that contains the links) and choose Edit, Links. Click the Change Source button, and choose the appropriate file from the Change Links dialog box. By default, the cell addresses that were copied will be retained.
Breaking Links Between Files
You can break links by choosing Edit, Links, Break Link. Most broken links occur accidentally—the user changes the name of either the source or target file or moves one or both files to a new folder. Any change in name or location of either the source or target file will result in a broken link.

27) Macros

Topics: - Moving around in Excel (Navigating)
Recording a Macro
Limitations
Referential versus Absolute
Find and Replace
Shortcut-Keys
Menu/Toolbar Options
Editing a Macro
Deleting a Macro
There are three distinct text modes in Excel. To be able to tell what mode is current, look at the status bar, in the bottom left corner of the screen.

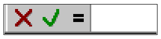
Ready - **Excel is usually in** *Ready* **mode. This means nothing is being** ***enter*ed or *edit*ed on the spreadsheet, but you can format the cell(s).**

Enter - **Excel changes to** *Enter* **mode when you indicate you want to** ***enter* information. Either by clicking into the formula bar, double clicking on a blank cell or simply by beginning to type in any cell. In** *Enter* **mode, the text navigation keys (arrows, home/end) work on the spreadsheet level moving you between cells.**

Edit - **Excel changes to** *Edit* **mode when you double click on a cell with data in it, or when you press the** F2 **key on the keyboard.** *Edit* **mode allows you to use the text navigation keys (arrows, home/end) to move among the characters.**

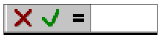
The *arrow keys* on the keyboard
In **Ready/Enter** mode they will move you up, down, left and right by one cell
Shift and the arrows, it will select a range of cells as you move
Ctrl and the arrows moves to the edge of the current data region (where the data stops/starts)
Shift-Ctrl and arrows will select to the edge of the current data region
In **Edit** mode – will move you up, down, left and right within the cell (if you only have one line of text the up and down arrows have no effect)
Shift and the arrows will select text in that direction (from where the cursor was blinking)
Ctrl and the left and right arrows will move word by word
Shift-Ctrl and the left and right arrows will select text, word by word

Esc (escape) acts as a cancel; if you are editing/entering a cell, escape will go back to enter mode ignoring any changes you have made. This is the same as clicking the red X on the formula bar.



Tab moves right to a cell (if in Edit/Enter mode, Tab will accept changes and move right)
Shift-Tab moves left
Ctrl-Tab moves you to another Workbook (another open file)
Alt-Tab **moves you to another** open **application (program such as MS Word)**

Enter moves down a cell (if in Edit/Enter mode, Enter will accept changes and move down)
Shift-Enter moves up
In Edit/Enter Mode
Alt-Enter forces a cell to put text on a second line
Ctrl-Enter accepts changes and remains on that cell. This is the same as clicking the green ✓ on the formula bar.



Page Up & **Page Down** moves a screenful up or down, respectfully
Ctrl-Page Up & **Ctrl-Page Down** moves to the previous or next *Worksheet*, respectfully
Alt-Page Up & **Alt-Page Down** moves a screenful left or right, respectively

Home
Edit Mode -
Home moves to the beginning of the cell
Shift-Home will select from where the cursor is blinking to the beginning of the cell
Enter/Ready Mode -
Home moves to the first column
Shift-Home will select from the current cell to the first column
Ctrl-Home will move to the very top of your worksheet
Shift-Ctrl-Home will select from the current cell to the very top of the worksheet

End
Edit Mode –
End will move to the end of the cell
Shift-End will select from where the cursor is blinking to the end of the cell
Ctrl-End moves to the last working cell on the worksheet, which is the cell at the intersection of the right-most used column and the bottom-most used row (in the lower-right corner)
Shift-Ctrl-End will select to the last (working) cell on the spreadsheet

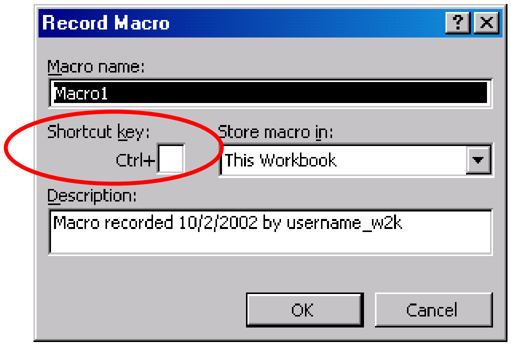
Using the Mouse & Keyboard
Clicking on any cell will make it the current cell.

Double clicking on a blank cell will put that cell into enter mode, double clicking on a cell with data in it will put that cell in edit mode.

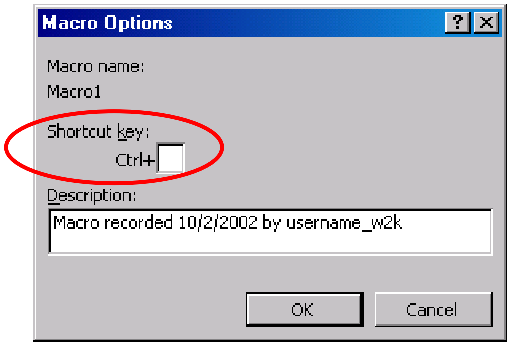
If you use **Shift** and the mouse you can select a range (a set of conjoining cells). Click where you want to start, hold down the **Shift** key and click where you want to stop. Every cell in between will be selected.

If you use the **Ctrl** and the mouse you can select various cells. (skipping ones in between). You cannot use these in equations but you can apply to formatting (change several cells to red text).

To run the macro by pressing a keyboard shortcut key, enter a letter in the **Shortcut key** box, either when you create the macro, or later from the Options button on the Macro Window. You can use CTRL+ *letter* or CTRL+SHIFT+ *letter*, where *letter* is any letter key on the keyboard. The shortcut key will override any default Microsoft Excel shortcut keys while the workbook that contains the macro is open.
Tools-Macro-Record New Macro Tools-Macro-Macros…-(select macro)-Options



Macro name: Macro1
Store macro in: This Workbook
Description: Macro recorded 10/2/2002 by username_w2k



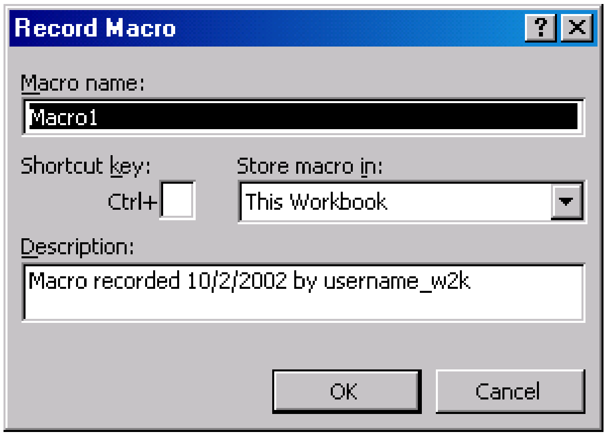
Macro name: Macro1
Description: Macro recorded 10/2/2002 by username_w2k

Ctrl-A – Select All
Ctrl-B – Bold
Ctrl-C – Copy
Ctrl-D – Fill down
Ctrl-E – *Unassigned*
Ctrl-F – Find
Ctrl-G – Goto
Ctrl-H – Replace
Ctrl-I – Italicize
Ctrl-J – *Unassigned*
Ctrl-K – Hyperlink
Ctrl-L – *Unassigned*
Ctrl-M – *Unassigned*
Ctrl-N – New Workbook
Ctrl-O – Open Workbook
Ctrl-Shift-O – Select Cells with Comments
Ctrl-P – Print
Ctrl-R – Fill to the right
Ctrl-S – Save
Ctrl-T – *Unassigned*
Ctrl-U – Underline
Ctrl-V – Paste
Ctrl-W – Close Workbook
Ctrl-X – Cut
Ctrl-Y – Redo/Repeat the last action
Ctrl-Z – Undo

Macro is a series of commands executed from just one command from the user. You can use Excel's macros to automate tasks that you find yourself repeatedly doing.

Record a new macro

From the **Tools** menu, choose **Macro**, **Record New Macro…** and you will get this dialog box:



Macro name: Macro1
Shortcut key: Ctrl+
Store macro in: This Workbook
Description: Macro recorded 10/2/2002 by username_w2k

The first step is to give your macro a descriptive name. You cannot use spaces, dashes (hyphens) or other special characters in your macro name, if you try, you will get an "That name is invalid" error message. You can use underscores (_) in place of spaces/dashes. (i.e. Page_Setup or Delete_Spaces will work).

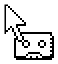
Next decide where to store the macro. You can save it in the current workbook (This Workbook). This choice will attach this macro to the current workbook, and it will only be accessible when this workbook is open. If you want to be able to use the macro from any workbook on that computer, choose the "Personal Macro Workbook".

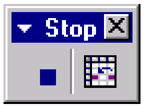
Decide if you want a shortcut key assigned to this Macro. If you do not want a shortcut key, leave the option blank, and click **OK** to begin recording your macro.

If desired, you can enter a description to better explain what this macro will do.

Recording a Macro

After you've named your macro, Excel takes you back into your spreadsheet. There are a few clues that show you are recording. The biggest is your mouse now has a tape cassette attached to it.





You will also have a new toolbar floating on your screen. If you would like you can move the toolbar without affecting the macro, by clicking and dragging the blue title bar of the toolbar.

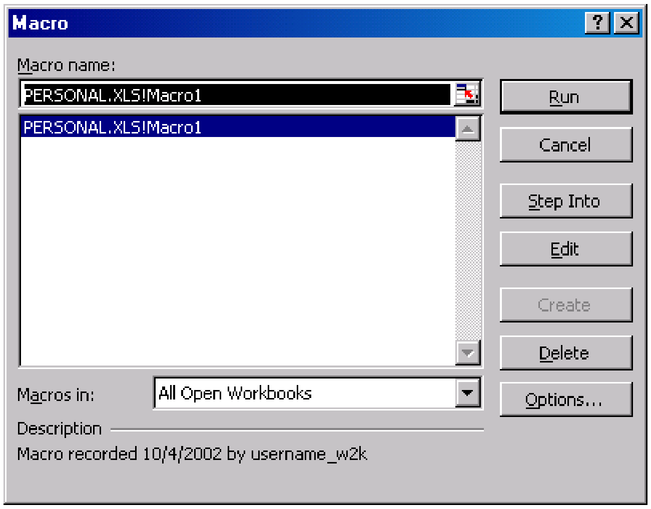
This new toolbar only has two buttons, **Stop** and **Use Relative Reference**. If you click the **X** to close this menu, Excel will stop recording the macro. You can also stop recording by clicking **Stop**.

The **Use Relative Reference** button determines whether the Macro recorder uses relative or absolute references to the cells on a worksheet. The button is set to Absolute when it's first shown. This means that Excel will record the exact address. Absolute references do not automatically adjust when you insert rows and columns. When the button is pushed, Excel will keep track of a Relative Reference. This means Excel will record the macro, relative to where you start. It is very possible to switch between modes while recording your macro.

Once you have completed all the steps that you wanted to automate, stop the macro.

You should test the macro to make sure that it works, if you assigned a keyboard shortcut, use that, otherwise go through the menu, Tools-Macros-Macros… (Alt-F8), choose the macro and **Run**.

If you **Edit** the macro you will actually see the visual basic code. This is also the window where you can delete a macro.



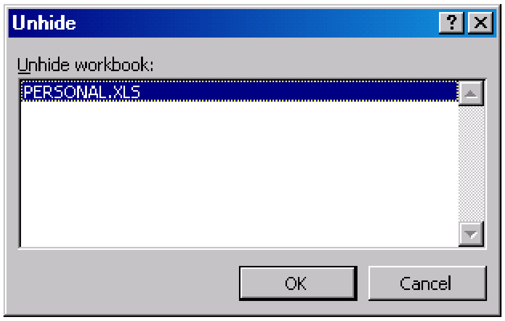
Macro name: PERSONAL.XLS!Macro1

PERSONAL.XLS!Macro1

Macros in: All Open Workbooks

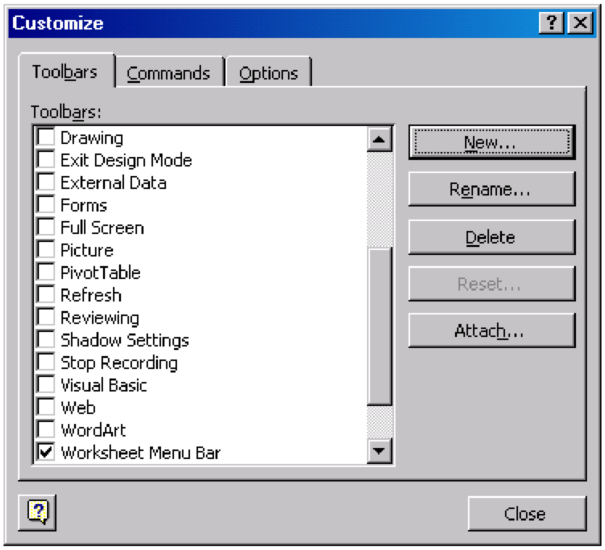
Description
Macro recorded 10/4/2002 by username_w2k

If you have saved your macro in the PERSONAL.XLS as the macro show above was, then you will not be able to delete the macro yet, you will have to *unhide* the personal workbook.
Window->Unhide->Personal.xls->OK

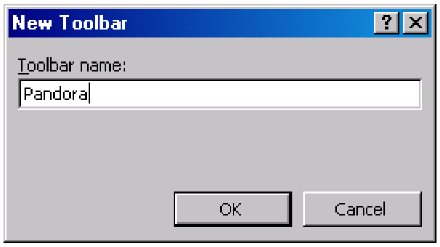

Unhide
?
OK
Cancel

Unhide workbook: PERSONAL.XLS

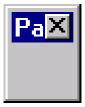
Once you are in this Worksheet, you can delete the macros saved here, just be sure to hide this worksheet again when you are done. (Window->Hide)
Adding Toolbars and Buttons
To add a toolbar, choose Tools-Customize, click on the Toolbar tab. Click the new button:


Customize
Toolbars
Commands
Options
Toolbars:
Drawing
Exit Design Mode
External Data
Forms
Full Screen
Picture
PivotTable
Refresh
Reviewing
Shadow Settings
Stop Recording
Visual Basic
Web
WordArt
New...
Rename...
Delete
Reset...
Attach...
Close

☑ Worksheet Menu Bar

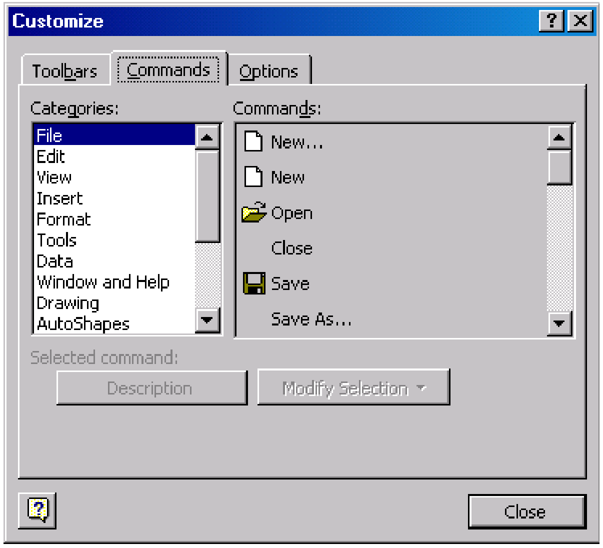

New Toolbar
OK
Cancel

Toolbar name: Pandora

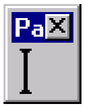


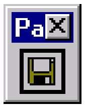
You'll get a blank toolbar such as this one.

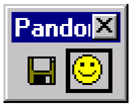
To add buttons to the toolbar switch to the **Commands** tab, on the Customize Window.
If the button you desire already exists you can click and drag the button to the toolbar. As you drag the button to the toolbar, you will see an I marker on the toolbar to indicate where it's placing the button.
If you would like to add the buttons for your macros, scroll to the bottom of the categories list. Choose **Macros** and drag over the Custom Button that is a happy face.
To assign the button to your macro, make sure the button is highlighted, as shown here (it has the box around it), from the Customize


Customize
Toolbars
Commands
Options
Categories:
Edit
View
Insert
Format
Tools
Data
Window and Help
Drawing
AutoShapes
Commands:
New...
New
Open
Close
Save
Save As...
Selected command:
Description
Modify Selection
Close

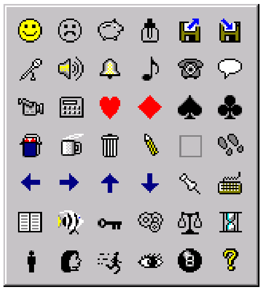
Categories: File







window choose **Modify Selection**. Choose **Assign Macro…**, Select the macro you want for this button, and click **OK**.



To change the way the button looks, so you don't have 10 happy face buttons, click on the **Modify Selection** button again. You can **Change the Button Image**, or give the button an appropriate **Name** and tell Excel to use **Text Only** or **Image and Text**.

You can also copy and paste an existing button image and even **Edit the Button Image** to create your own graphical button.