الجامعة المستنصرية
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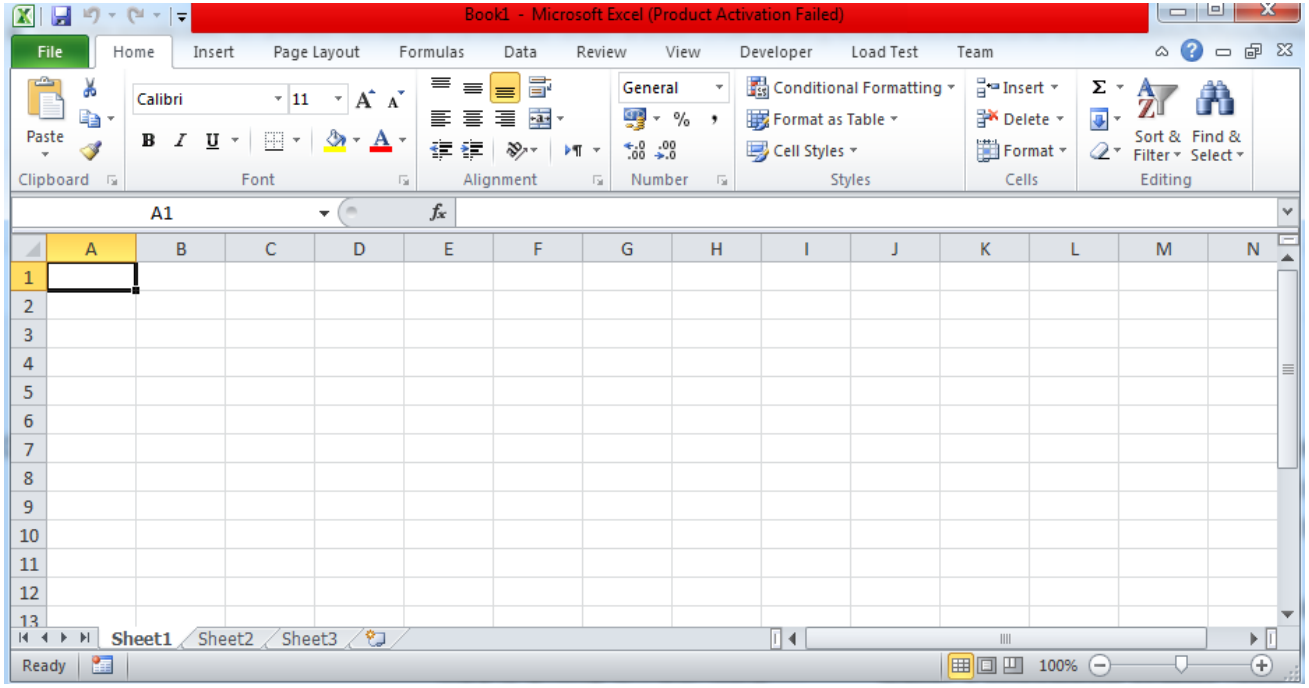
Computer Skills 2

Microsoft Excel 2016

1. Understanding the Excel Interface
2. Workbooks and Worksheets
3. Working with Table
4. Moving Around in a Worksheet
5. Working with Ranges
6. Working with Rows and Columns
7. Working with Cells
8. Calculations on Data
9. Creating Charts
10. Using Formulas and Functions
11. Using Operators in Formulas
12. Using Cell References in Formulas
13. Using Functions in Formulas

Understanding the Excel Interface

As you learned, "Understanding Microsoft Office 2016," each Office 2016 application has the same basic controls, including a tabbed Ribbon, title bar, status bar, scroll bars, and Backstage view.



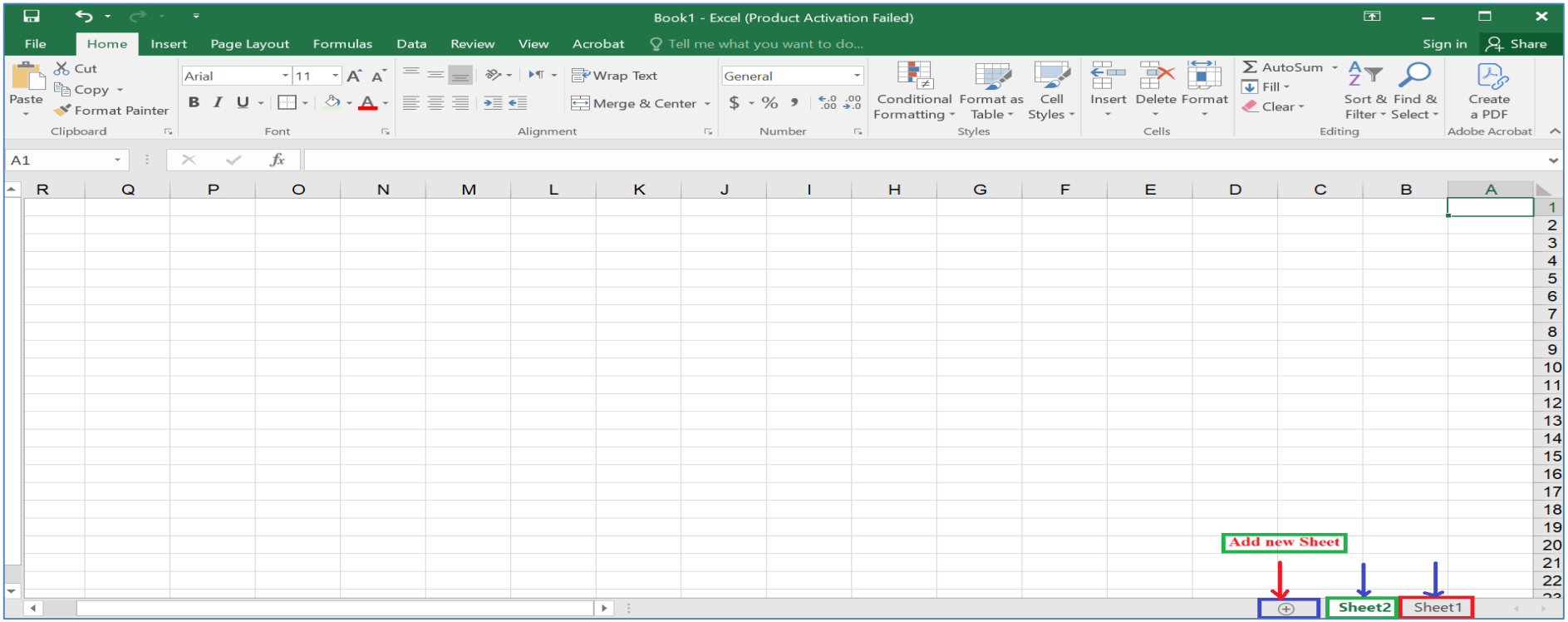
Spreadsheets

help us to organize, calculate, and make sense of numeric data. Like the orderly row-and-column format of a paper ledger, a spreadsheet enables users to organize large amounts of data so that it is easy to understand and easy to refer to.

Workbooks and Worksheets

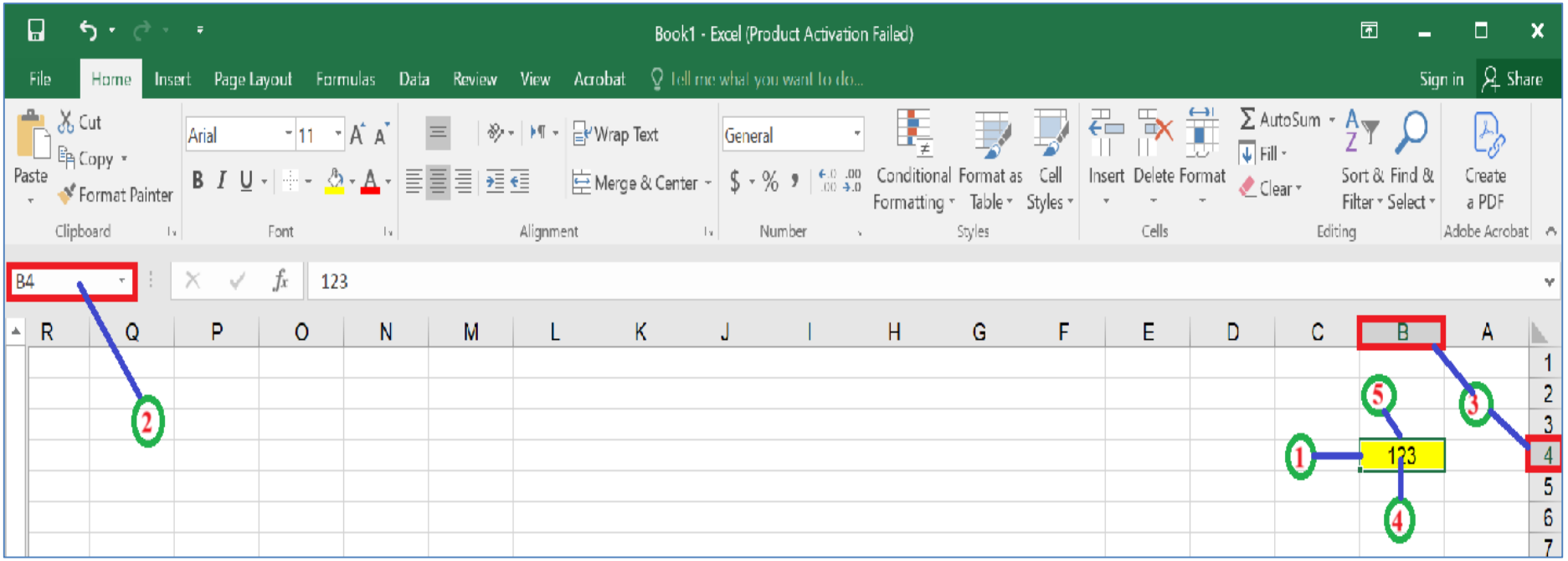
Workbook An Excel data file, containing one or more worksheets.
Worksheet A tabbed page of a workbook, containing a grid of rows and columns.
Sheet area is the place where you type your text

- **Excel calls** a data file a workbook.
- **Each workbook**, by default, contains three tabbed pages.
- **Each page** is a worksheet.



Workbooks and Worksheets

1. **Cell** The intersection of a row and a column in a worksheet.
2. **Name box** The box where the name of the active cell appears.
3. **Cell address** The column letter and the row number that intersect to form the cell, such as B3 or A6.
4. **Active cell** The cell that the cell selector is on. Any content entered will appear in the active cell.
5. **Cell selector** The movable dark outline around the active cell.



Workbooks and Worksheets

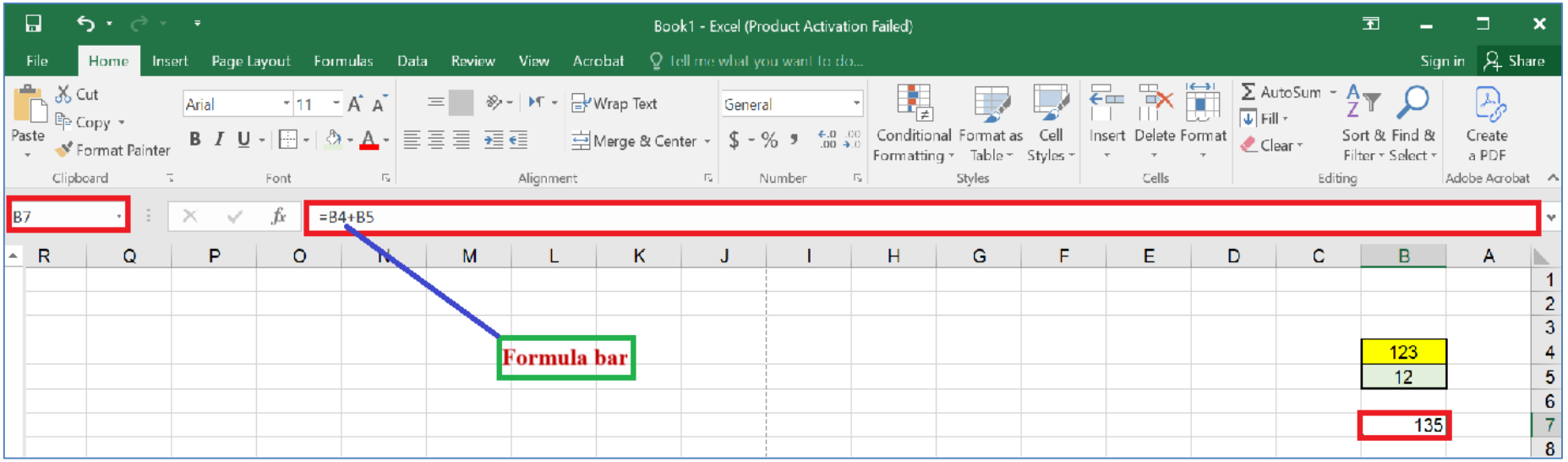
6. **Formula bar** The bar above the worksheet where the contents of the active cell appear.

- If the active cell contains a formula, the formula appears in the formula bar and the result of the formula appears in the cell itself.

Example :

formula in cell B7=B4+B5. Because that cell is active, you can see the formula in the formula bar. Cell B7 itself shows the result: 135.

Name box shows the cell's address: B7. If the cell contains a numeric value or a text string, the formula bar shows the same content as the cell itself.

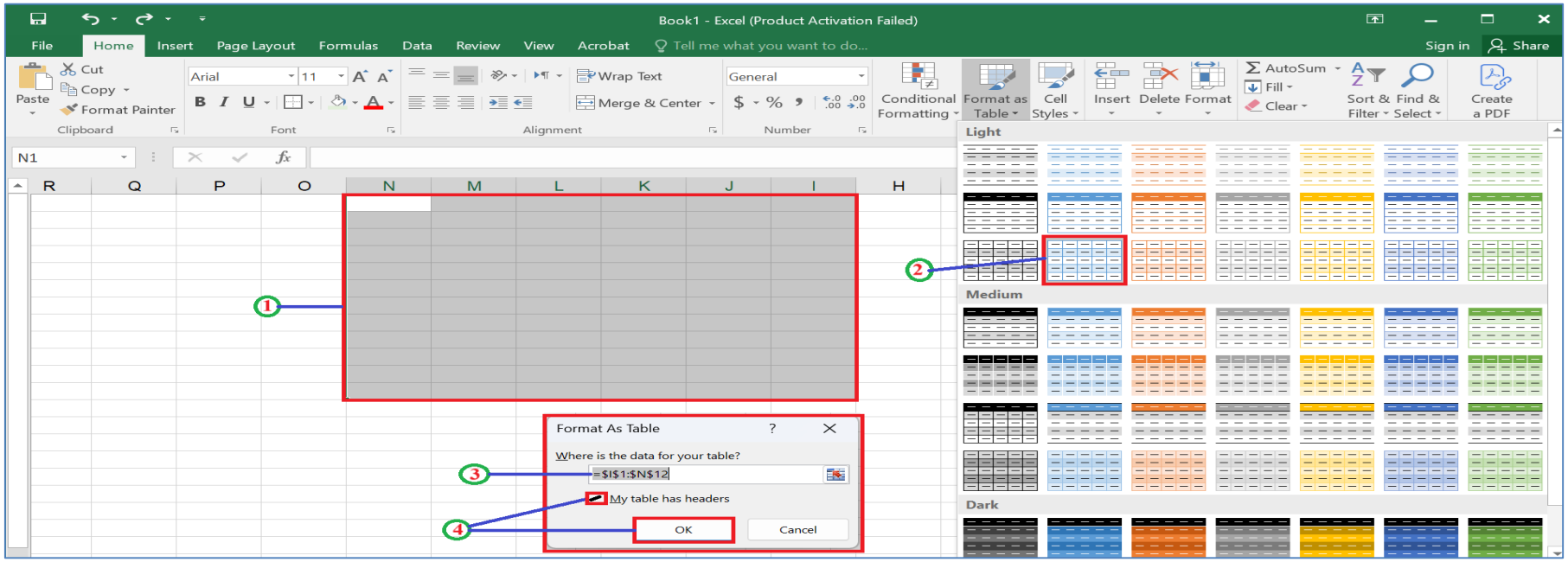


Converting a Range to a Table

Table: A group of cells that work together to store structured data.

To quickly create a table in Excel, do the following:

1. Select the cell or the range in the data.
2. Select Home → Style group →Format as Table.
3. Choose a table style.
4. In the Format as Table dialog box, select the checkbox next to My table as headers if you want the first row of the range to be the header row, and then click OK.



Converting a Range to a Table

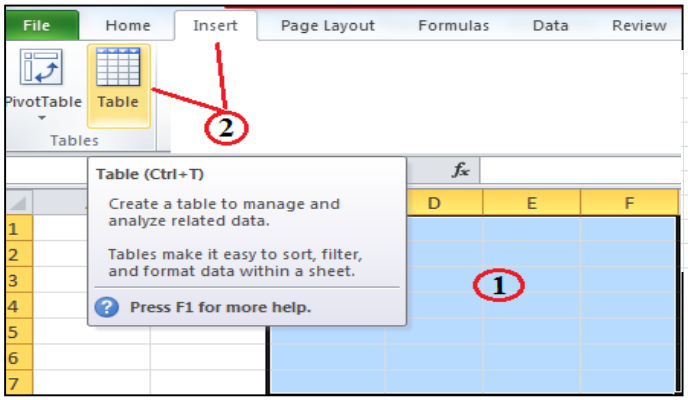
There are two methods of converting a range to a table :

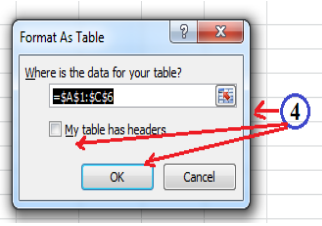
1. default table style

Use these steps to convert a range to a table and apply the default table style to it:

1. Select the range.

2. On the Insert tab, click Table.





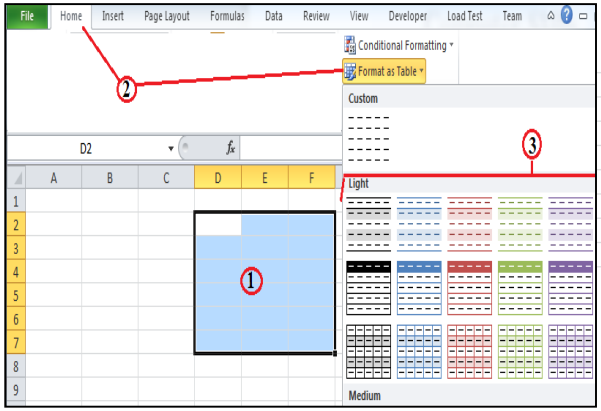
2. Choice of Style.

Use these steps to convert a range to a table and apply your choice of table style to it:

1. Select the range.

2. On the Home tab →Format as Table.

3. Click the desired style.



After the table has been created, you can change the table style from the Table Tools Design tab.

Sorting a Table

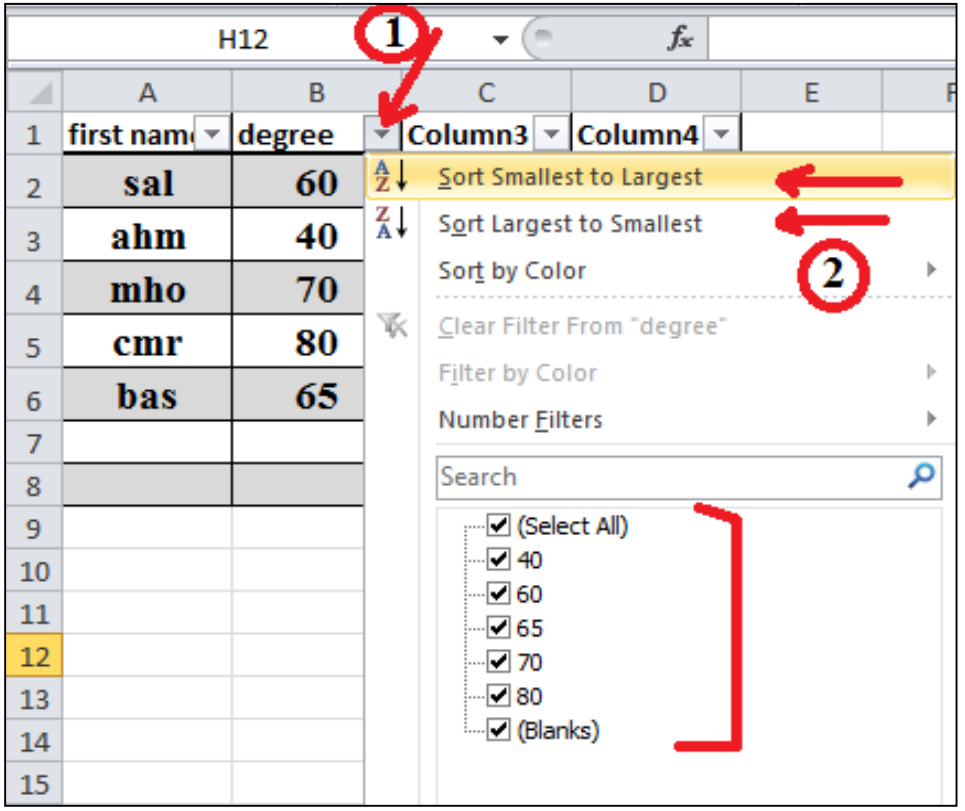
- **In a table, each column is known as a field. A field contains a specific type of structured data, such as Phone or Address.**
- **Each row is a record, containing all the fields for a specific instance.**

To sort means to put records into a specific order according to the entry in a certain field.

To sort a table,

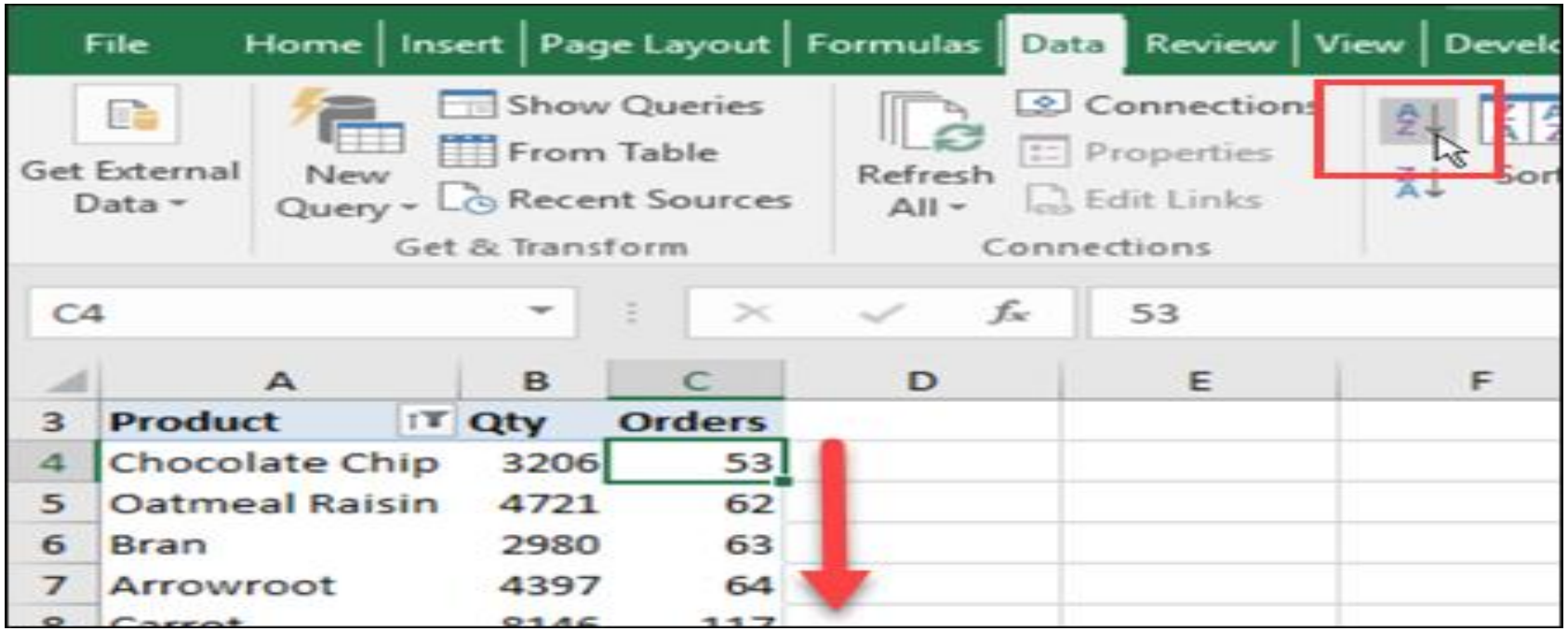
1. Click the down-arrow button to the right of the field by which you want to sort.

2. Opening a menu, and on that menu, click Sort A to Z or Sort Z to A, depending on whether you want an ascending sort or descending sort.



Sorting a Table

- **field** :A column in a table, storing one particular kind of information, such as Phone or Name.
- **Record** :A row in a table, storing information about a specific person, place, or thing.
- **Sort**: To put records in a specific order according to the entry in a certain field.
- **Ascending sort:** An A to Z sort, or a sort from smallest to largest.
- **descending sort:** A Z to A sort, or a sort from largest to smallest.



Filtering a Table

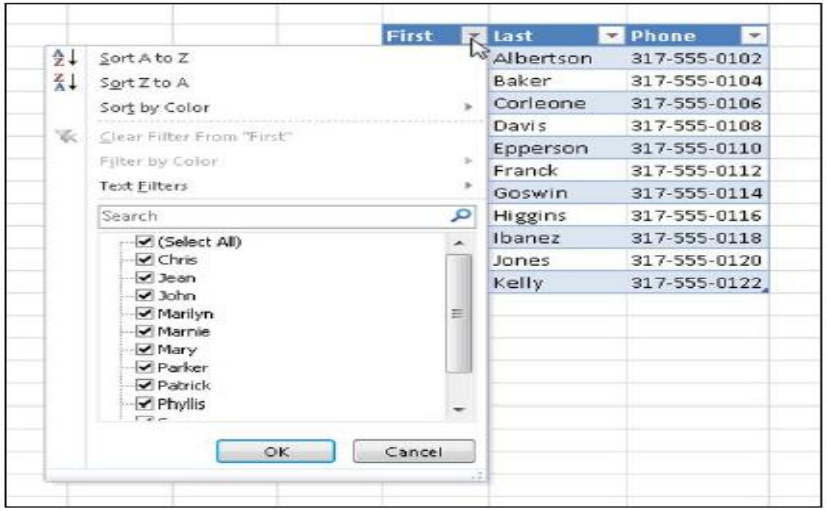
Filter :To hide certain records according to criteria you specify.

- To clear a filter, display the Data tab and click Clear, or open the field's menu and choose Clear Filter from Fieldname.

You can filter a table by:

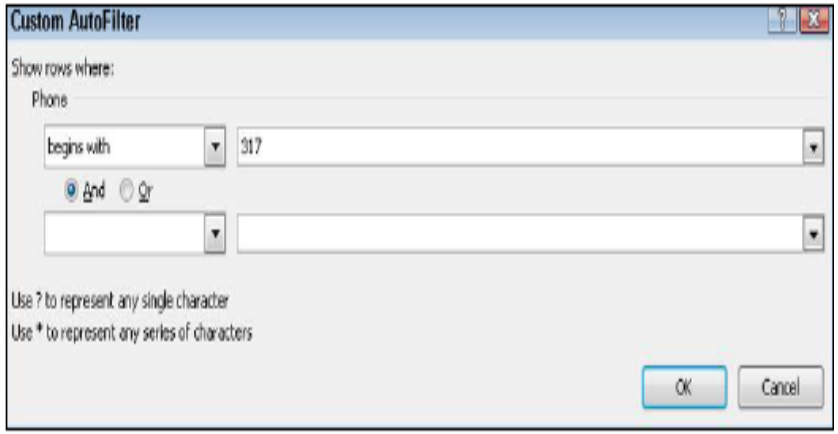
1. Exclude records that contain a certain value in a certain field:

open a field's menu at the bottom of the menu, clear the check boxes for any entries that you do not want to be included.



2. Criteria you define :

open a field's menu → point to Text Filters (or Number Filters, or whatever appears, depending on the field data type) to open a submenu, and then choose a filtering criterion, such as Equals, Does Not Equal, Begins With, or Ends With.



Moving Around in a Worksheet

1. To type in a cell, you must make it the active cell, either by clicking it or by using one of the keyboard methods of moving the cell selector.
2. Moving the cell selector is not the same as scrolling. When you scroll the worksheet, you change which cells are visible, but you do not change the active cell.
3. To enter content in a cell, make the cell active by moving the cell selector to it, as you learned in the preceding section, and then just start typing.
4. When you are finished, move to another cell.

Any arrow key	One cell in the direction of the arrow
Tab	One cell to the right
Shift + Tab	One cell to the left
Ctrl + arrow key	To last or first non-empty cell in the direction of the arrow
Ctrl + End	To bottommost, rightmost cell of worksheet contains data
Ctrl + Home	To the beginning of the worksheet
Home	To the beginning of the active cell's row
Page Down	One screen down
Page Up	One screen up
Alt + Page Down	One screen to the right
Alt + Page Up	One screen to the left
Ctrl + Page Down	To the next sheet in the workbook
Ctrl + Page Up	To the previous sheet in the workbook

Keyboard Shortcuts for Moving the Cell Selector

Editing Cell Content in a Worksheet

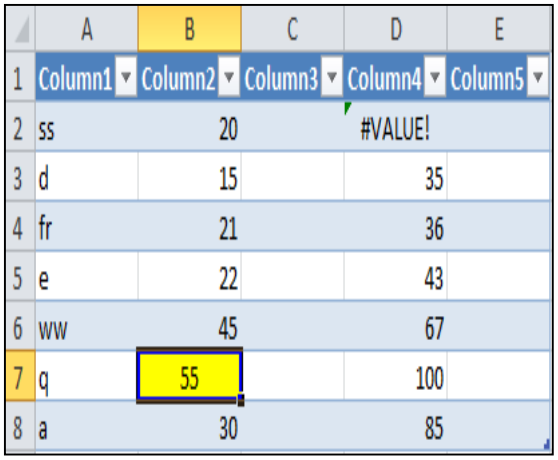
To edit a cell's content, make the cell active and then do any of the following:

1. **To replace the cell's content with a new entry, type the new entry.**

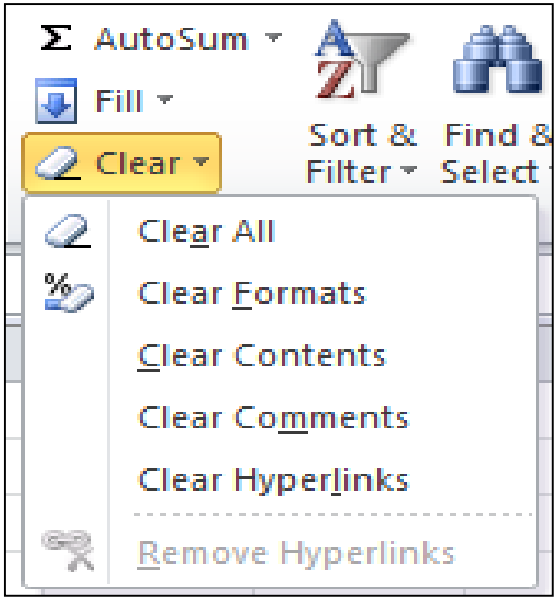
2. **To edit the cell's content without replacing it entirely,**
   - **Click in the formula bar and make your edits there, Or**
   - **Double-click the cell to move an insertion point into it and then edit the text directly in the cell.**

3. **To clear all the text from the cell, press the Delete key.**

4. **To clear both the text and the formatting from the cell, click the Home tab, click the Clear button, and click Clear All.**



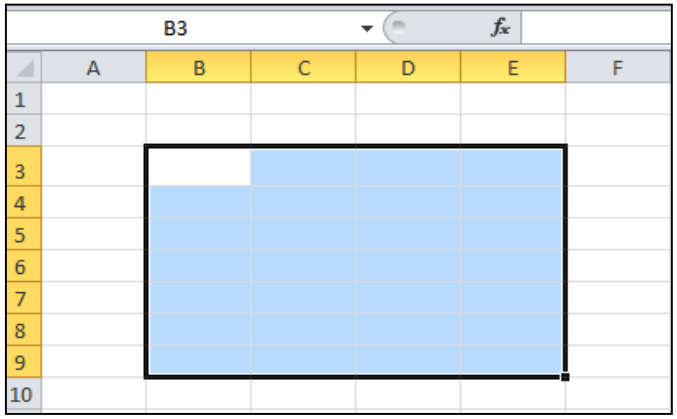
	A	B	C	D	E
1	Column1	Column2	Column3	Column4	Column5
2	ss	20		#VALUE!	
3	d	15		35	
4	fr	21		36	
5	e	22		43	
6	ww	45		67	
7	q	55		100	
8	a	30		85	



Working with Ranges

A range is one or more cells that are selected at the same time.

- A range can be a single contiguous rectangular block or multiple cells or groups of cells from different locations, including on different worksheets.



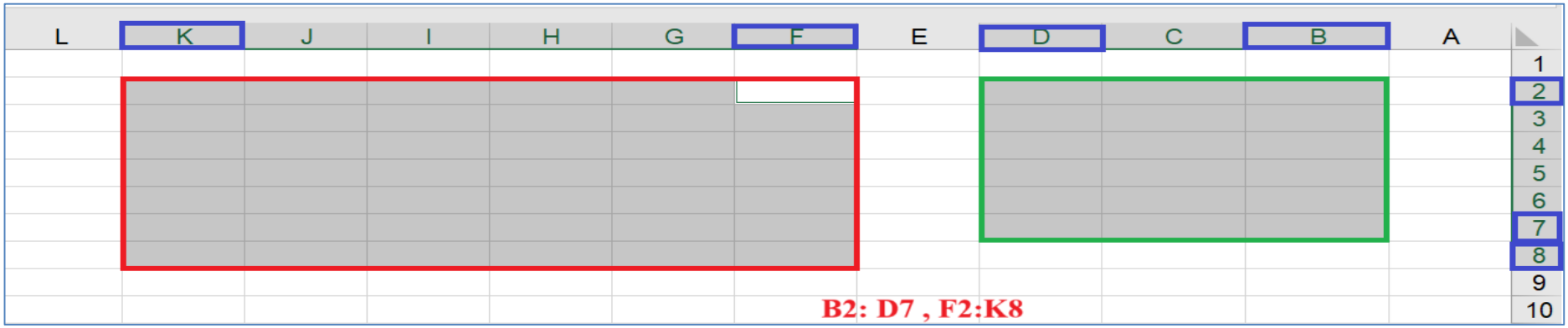
Describing a Range

When a range is a contiguous rectangular block, its name is written with the upper-left cell address, a colon, and the lower-right cell address, like this:

B2:C8

When a range contains non-contiguous cells or blocks, the pieces are separated by a comma, like this:

B2:D7 , F2:K8



Selecting Row and Column

Selecting a Range

1. To select an entire row, click its row number.
2. To select an entire column, click its column letter.
3. You can select multiple rows or multiple columns by dragging across the row numbers or column letters.
4. You can drag across a contiguous range to select it.
5. To select a noncontiguous range with the mouse, hold down the Ctrl key as you drag across the blocks of cells to select and click the individual cells to select. Release the Ctrl key when you are done choosing cells to include.
6. You can also use keyboard shortcuts to select a range,

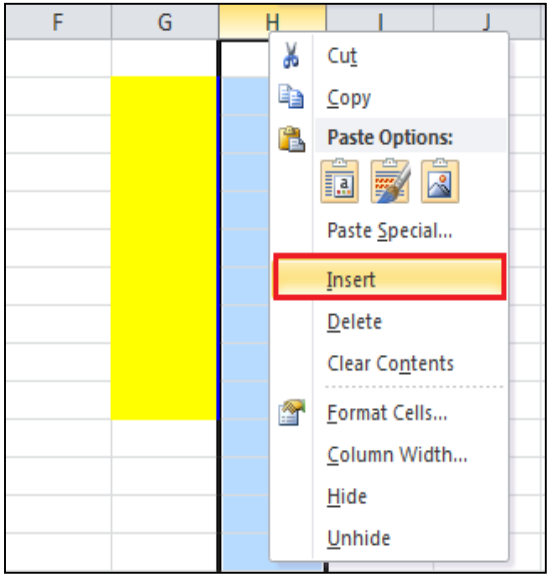
Ctrl + A	The entire worksheet
Ctrl + spacebar	The entire column of the active cell
Shift + spacebar	The entire row of the active cell
Ctrl + Shift+ arrow key	The last nonblank cell in the same column or row as the active cell, or if the next cell is blank, to the next nonblank cell
Ctrl + Shift + End	The last non-empty cell on the worksheet (lower-right corner)
Ctrl+ Shift + Home	Cell A1
Ctrl + Shift + Page Down	The current and next sheets in the workbook
Ctrl+Shift+Page Up	The current and preceding sheets in the workbook

Working with Rows and Columns

Inserting Rows or Columns

Use these steps to insert one or more rows or columns:

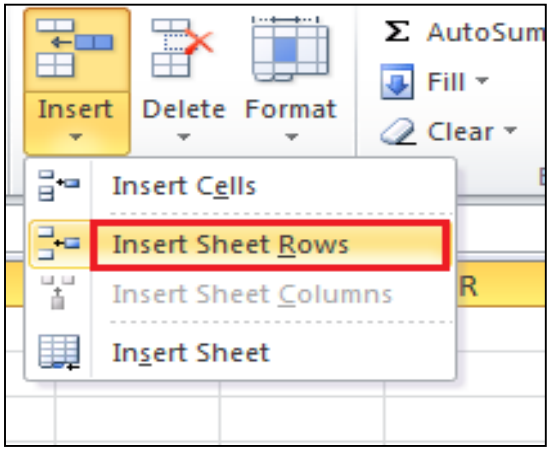
1. Select the row that the new row should appear above or the column that the new column should appear to the left of.
2. If you want to insert multiple rows or columns, select multiple rows or columns. For example, to insert three rows above row 10, you would select rows 10, 11, and 12.
3. On the Home tab, click Insert.



Deleting Rows or Columns

Use these steps to delete one or more rows or columns.

1. Select the row(s) or column(s) to delete.
2. On the Home tab, click Delete. OR Right-click the selected range and choose Delete from the context menu.

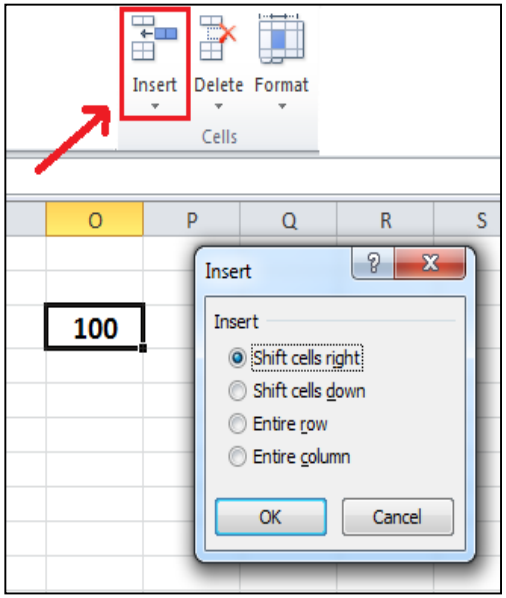


Working with Cells

Inserting Cells

Use these steps to insert one or more cells:

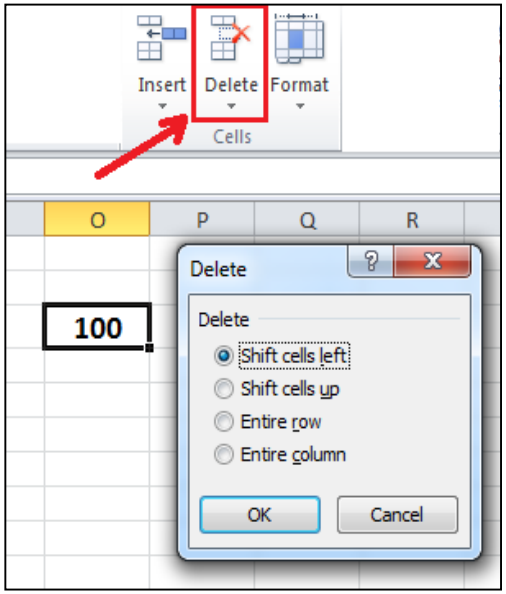
1. **Select a range where you want the new cells to be inserted. It doesn't matter if that range already contains data.**
2. **On the Home tab, click the down arrow to the right of the Insert button. The Insert dialog box opens.**
3. **Click the option button to describe what should happen to the cells in the selected range.**
4. **Click OK.**



Deleting Cells

Use these steps to delete one or more cells:

1. **Select a range of cells that you want to delete.**
2. **On the Home tab, click the down arrow to the right of the Delete button. The Delete dialog box opens.**
3. **Click the option button to describe what surrounding cells should shift to fill in the vacated space.**
4. **Click OK.**



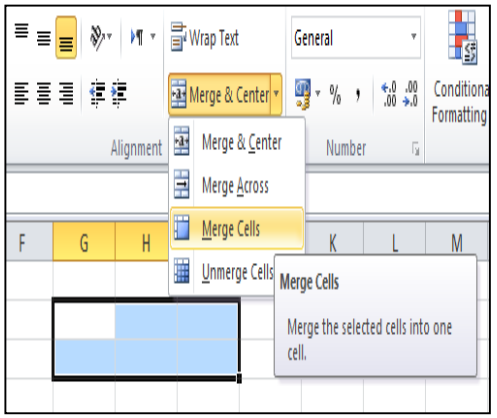
Working with Cells

The orderly grid format of a worksheet means that you have the same number of rows in each column, and the same number of columns in each row usually. For special layout effects, you can merge two or more cells into a single cell that occupies the same space as the two would have taken up separately.

Merging Cells

Use these steps to merge contiguous cells:

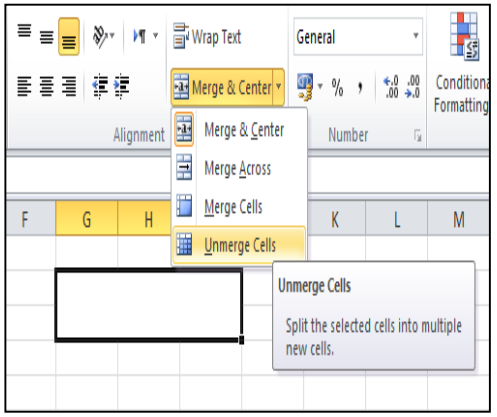
1. **Select the cells to merge. Keep in mind that only the text in the upper-left cell will remain after the merge; it will appear as the text in the merged cell.**
2. **On the Home tab, click the Merge and Center button.**



Unmerging Cells

Use these steps to unmerge a merged cell:

1. **Select the merged cell.**
2. **On the Home tab, click the down arrow to the right of the Merge and Center button.**
3. **On the menu that appears, click Unmerge Cells. Note that any text that was deleted as a result of the merge will not return when the cell is unmerged.**

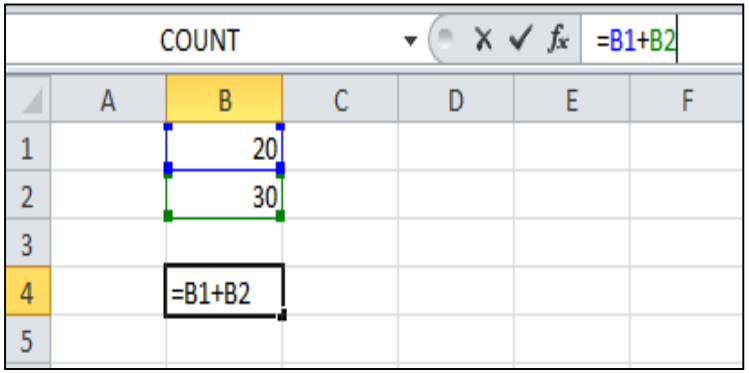


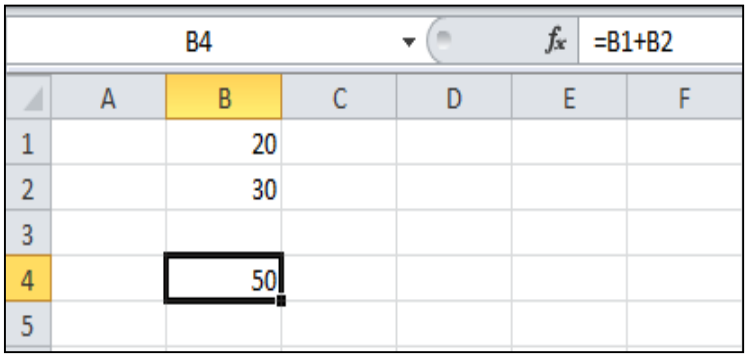
Calculations on Data

- Excel uses standard operators for equations, such as a plus sign for addition (+), minus sign for subtraction (-), asterisk for multiplication (*), forward slash for division (/), and caret (^) for exponents.
- The key thing to remember when writing formulas for Excel is that all formulas must begin with an equals sign (=). This is because the cell contains or is equal to he formula and its value.

EXAMPLE1: create a simple formula in Excel:

1. Select the cell where the answer will appear (B4).
2. Type the equals sign (=).
3. Type the cell address that contains the first number in the equation (B1).
4. Type the operator you need for your formula. For example, type the addition sign (+).
5. Type the cell address that contains the second number in the equation (B2).
6. Press Enter. The formula will be calculated, and the value will be displayed in the cell.



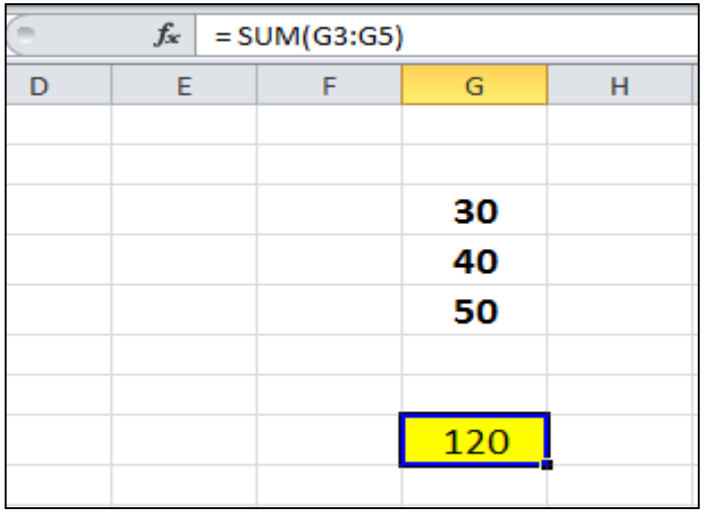


Using Formulas and Functions

Formulas **: are used to perform calculations in a worksheet. All formulas must begin with an equal sign (=).**

Formulas can consist of the following elements:

1. **Constant values (such as 5 or 100).**
2. **Cell references (such as A1 or A1:A3).**
3. **Operators (such as + for addition or * for multiplication).**
4. **Functions (such as SUM or AVERAGE).**



Using Operators in Formulas

Operators: are symbols that represent specific mathematical operations. Excel formulas support a variety of operators (see Table 3).

Arithmetic operators perform basic mathematical operations (such as addition or subtraction) and return numeric results.

Comparison operators compare two values and return TRUE or FALSE.

Table 3 – Arithmetic and Comparison Operators

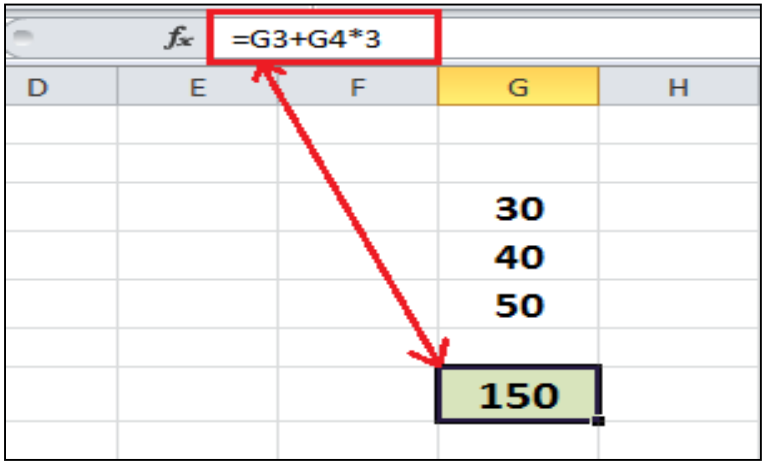
Operator	Description	Example	Result
+	Addition	=1+1	2
-	Subtraction	=1-1	0
*	Multiplication	=2*2	4
/	Division	=4/2	2
%	Percentage	=20%	0.2
^	Exponentiation	=2^3	8
=	Equal to	=1=2	FALSE
>	Greater than	=1>2	FALSE
<	Less than	=1<2	TRUE
>=	Greater than or equal to	=1>=1	TRUE
<=	Less than or equal to	=1<=1	TRUE
<>	Not equal to	=1<>1	FALSE

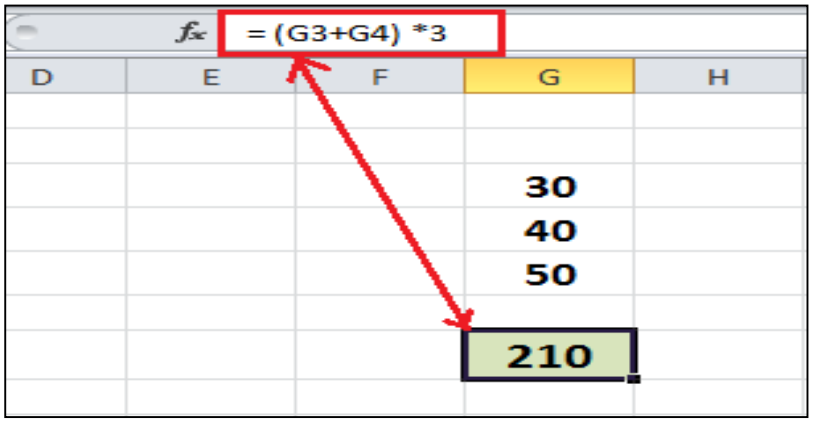
When a formula contains more than one operator, Excel performs calculations from left to right, based on the standard mathematical order of operations.

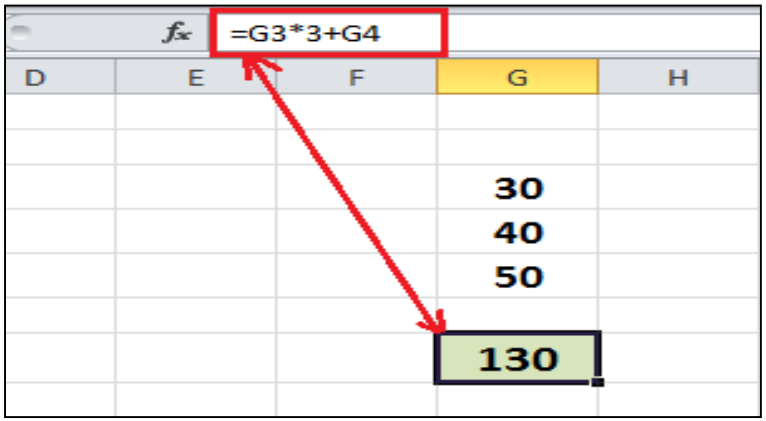
You can change this order by using parentheses; calculations within parentheses are performed first.

The basic order of operations is as follows:

1. **Percentage**
2. **Exponentiation**
3. **Multiplication and division**
4. **Addition and subtraction**
5. **Comparison**







Using Cell References in Formulas

Most formulas are created using cell references.

A cell reference : identifies a cell or a range of cells in a worksheet.

There are three types of cell references in Excel:

relative, absolute, and mixed

(see Table 4). These references behave differently when a formula is copied to other cells

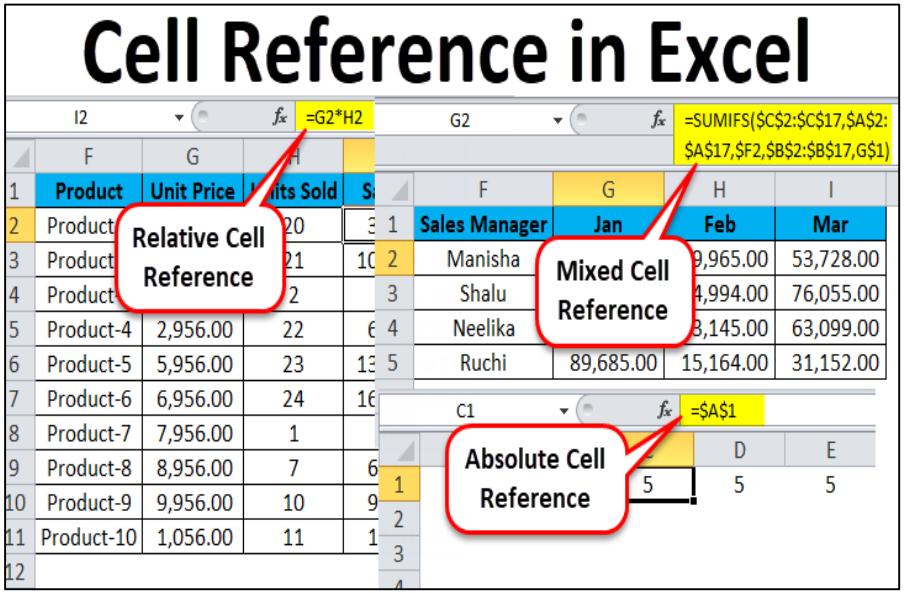


Table 4 – Types of Cell References

Reference Type	Description	Example
Relative	Refers to cells by their position in relation to the cell that contains the formula (such as "the cell two rows above this cell"). When you copy a formula containing relative references, the references adjust to the new location.	A1
Absolute	Refers to cells by their fixed position in the worksheet (such as "the cell located at the intersection of column A and row 1"). Absolute references always refer to the same cell, regardless of where the formula is copied.	A1
Mixed	Contain both relative and absolute references (such as "the cell located in column A and two rows above this cell"). When you copy a formula containing mixed references, the relative references adjust, but the absolute references do not.	$A1 or A$1

Entering Formulas

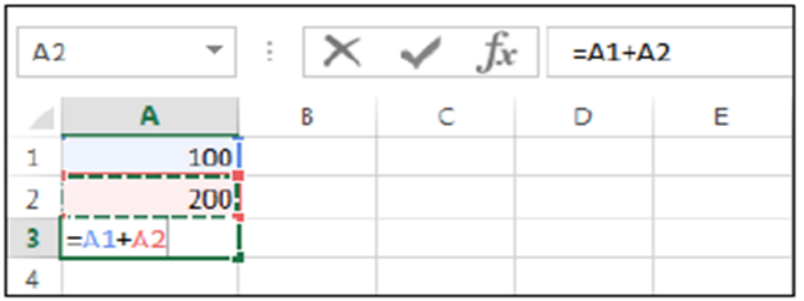
You can create a simple formula by entering constant values or using cell references.

The advantage of using cell references in a formula : is that the formula automatically recalculates whenever the value in any cell referenced in the formula changes.

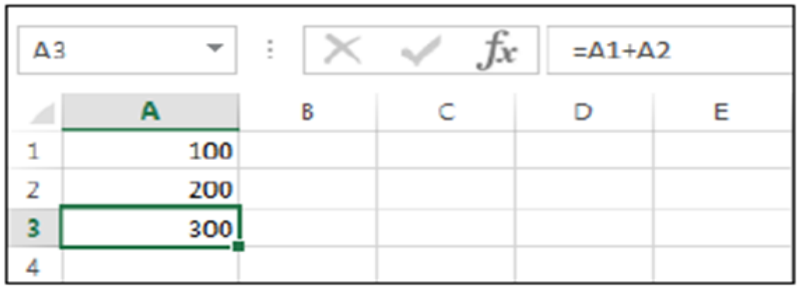
NOTE: To avoid typing mistakes, you can click a cell to insert its cell reference in a formula rather than typing its address.

To enter a formula:

1. Select the cell in which you want to enter the formula.
2. Type an equal sign (=).
3. Enter the first value or cell reference.
4. Enter the desired operator.
5. Enter the next value or cell reference.
6. Repeat steps 4 and 5 as needed to complete the formula
7. When finished, press the Enter key.



Cell While Entering a Formula



Cell Displaying the Formula Result

Using Functions in Formulas

Functions: are predefined formulas that can be used to perform complex calculations.

Excel includes hundreds of functions that you can use alone or in combination with other formulas or functions.

Each function has its own *syntax* which specifies how it must be written.

The general syntax of a function is an

- equal sign (=).
- followed by the function name.
- opening parenthesis.
- the function arguments.
- closing parenthesis.

Function	Description	Example
Sum	Add the values in the selected range.	=Sum(A1:A5)
AVERAGE	Average the values in the selected range.	=AVERAGE(A1:A5)
COUNT	Returns the number of cells containing numbers	=COUNT(A1:A5)
MAX	Returns the largest value in the selected range	=MAX(A1:A5)
MIN	Returns the smallest value in the selected range	=MIN(A1:A5)

Function names (such as SUM and AVERAGE) describe the operation the function performs.

Arguments specify the values or cell references the function uses when it performs its operations. Some functions have no arguments or the argument is optional.

Rules for using functions

There are a few rules to keep in mind when using functions:

1. **Arguments must be entered in the order required by the function.**
2. **Arguments must be separated by commas.**
3. **Optional arguments must be placed after the required ones.**
4. **Parentheses are needed with every function, including functions that have no arguments.**

Using the AutoSum Button

The *AutoSum* button provides quick access to the most commonly used functions (SUM, AVERAGE, COUNT, MAX, and MIN).

It appears on both the *Home* tab and the *Formulas* tab of the *Ribbon*.

The default action of the AutoSum button is the SUM function;

you can access the other functions by clicking the arrow on the button

AutoSum Menu

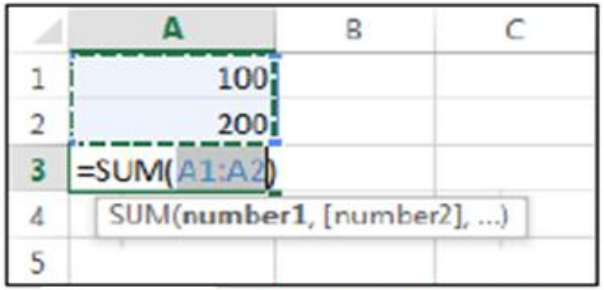
Rules for using functions

Sum Numbers Using the AutoSum button:

1. Select a cell next to the numbers that you want to sum.
2. On the Home tab, in the Editing group, click the AutoSum button.

Editing Group on the Home Tab

3. Excel automatically enters a formula that uses the SUM function and suggests a range to sum



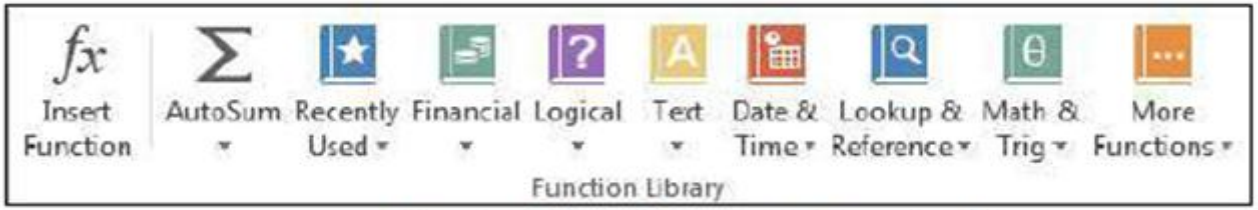
Cell with SUM Function

4. Do one of the following:
   1. If the suggested range is correct, press the Enter key to display the result.
   2. If the suggested range is incorrect, select the correct range, and then press the Enter key to display the result.

Rules for using functions

Inserting Functions

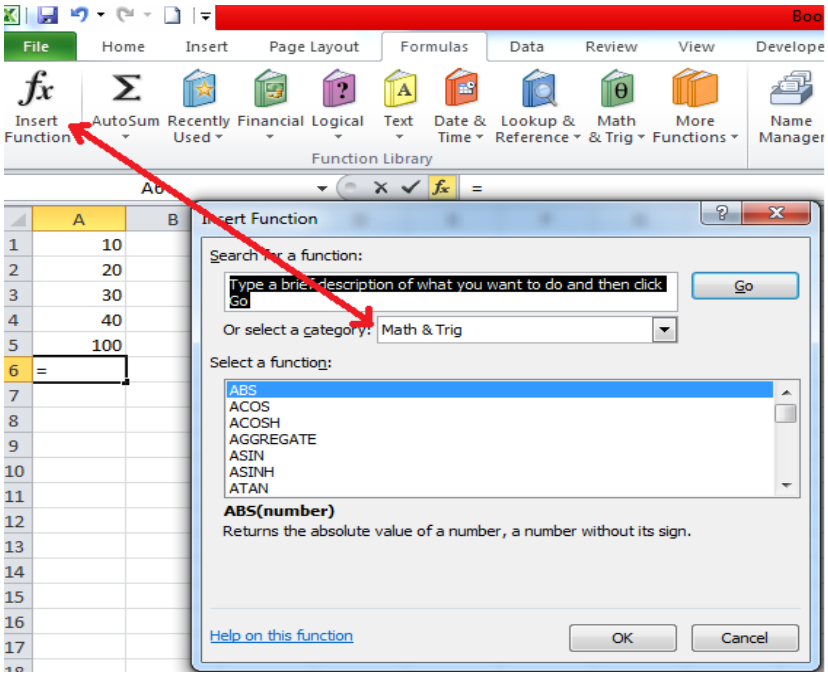
Functions are organized into categories (Financial, Logical, Text, Date & Time, Lookup & Reference, Math & Trig, etc.) based on their purpose



Function Library Group on the Formulas Tab

Each of the categories has a button in the Function Library group on the Formulas tab of the Ribbon.

- **You can insert a function into a formula by selecting it from one of the function categories.**
- **If you are not sure which category to choose, you can use the Insert Function dialog box to browse through the entire list of functions and select the one you need.**



Rules for using functions

insert a function:

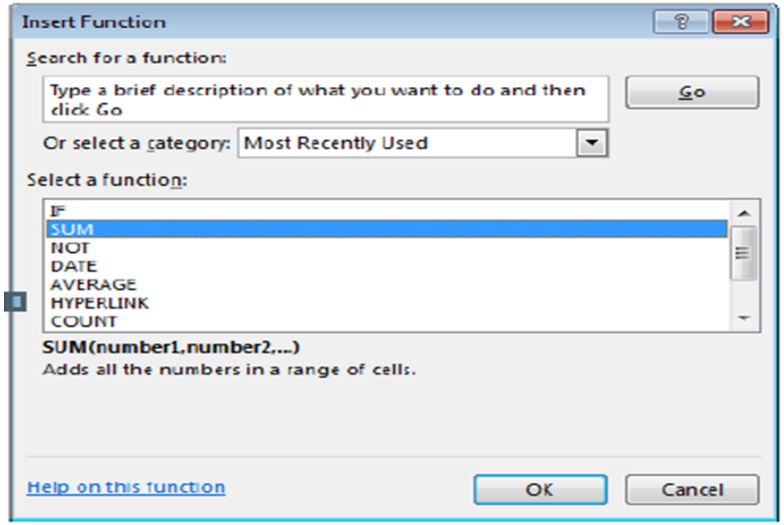
1. **Select the cell in which you want to enter the formula.**
2. **On the Formulas tab, in the Function Library group, click the Insert Function button.**

Or,

click the Insert Function button on the Formula bar.

Formula Bar

3. **In the Insert Function dialog box, search for a function or select a category, select the desired function, and then click the OK button**



Insert Function Dialog Box

The End