

## EXCEL BASICS

This tutorial is to help you learn what Excel is and how to use it in this class.

To read about any of the topics below you must hold down the Ctrl button and click on the underlined phrase you would like to learn about.

[What are cells?](#)

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[Make a "comma space" table](#)

## What are cells?

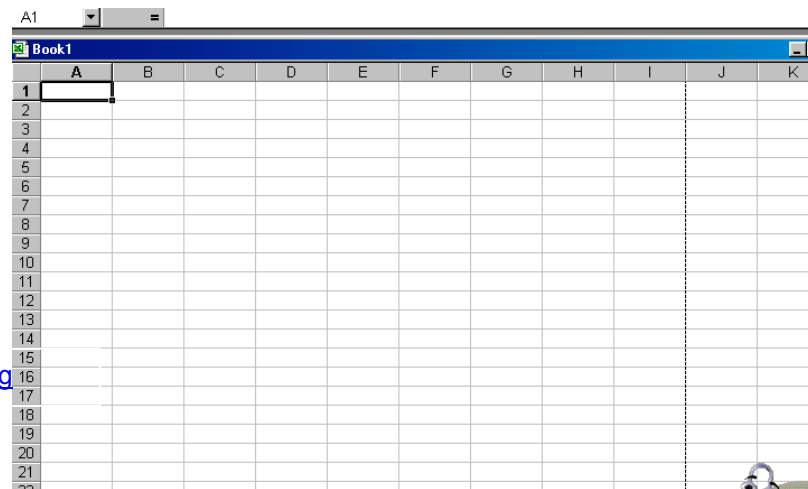
The information and formatting that will be used in your spreadsheet will be contained in cells. Cells are the rectangle boxes on the screen when an Excel spreadsheet is open.

Each cell has a reference letter (column) and number (row) referring specifically to that particular cell. For example, the top left cell on the spreadsheet is A1.

This information will become important when you are ready to develop your formulas.

Click on a cell and you will notice that the column and row pertaining to that cell will become slightly larger and darker; this will help you identify what the cell reference is for that cell.

For Example:



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## What are columns?

Columns start at the top of screen and are referenced by a LETTER. Columns are top to bottom (vertical).

To highlight a whole column – Click on the letter above the column. This should highlight the whole column

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## What are rows?

Rows are horizontal and are referenced by a NUMBER.

To highlight a whole row – Click on the number to the left of the row. This should highlight the whole row

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## What are workbooks?

Workbooks are a collection of 1 to 255 worksheets.

When a new workbook is opened it will be named Book1 on the title bar at the top.

The name will be changed to your choice when the workbook is saved as - Go to "File" "Save As" change the name under file name to mine.xls (make sure that .xls is in your file name, depending on how your computer is set-up).

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## What are worksheets?

A new workbook contains 3 worksheets.

More sheets may be added for a maximum of 255 worksheets - per workbook.

To add more worksheets

1. Click on "Insert" on the menu at the top and in the submenu click "worksheet".
2. You will notice a new sheet will appear in the workbook and the sheet will be named Sheet 4.
3. Within your workbook you may change the names, Double-click on the tab of the worksheet containing the name you would like to change.
4. The letters will become white inside a black rectangle. This lets you know it has been selected and is ready for you to type in a new name and press enter.

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## How do I get Excel to do my math?

Excel will do any calculation that you need.

You will always begin with the equals sign “=” . This set-up lets Excel know that a formula is about to begin.

Symbols for basic calculations are:

Addition “+”

Subtraction “-”

Multiplication “\*”

Division “/”

When you have completed your formula you will need to press the enter key or click the red check mark at the top

**IMPORTANT: DO NOT CLICK ANOTHER CELL WHILE ENTERING A FORMULA,** because that cell reference will appear in the formula.

Sample formulas: No Spaces!!

=2+5 add

=10-5 minus

=10\*500 multiply

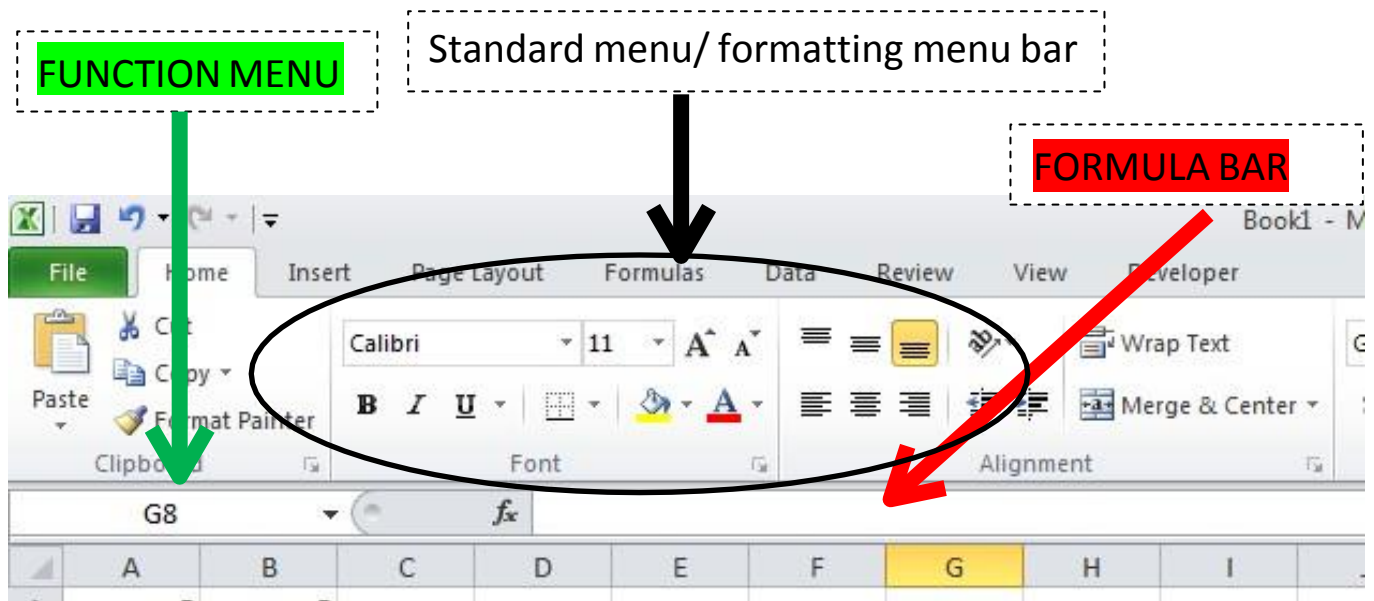
=500/10 divide

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## What is a formula?

A formula is basically getting Excel to “do your math calculation” but referencing data within a table. For example if you want to find the average of a column...

Across the top of the spreadsheet is a menu bar which you will utilize when necessary. This is the menu bar:



You will always begin with the equals sign “=”. This set-up lets Excel know that a formula is about to begin.

There is always more than one way to have Excel solve equations for you. You can google “how to ... in Excel” which should bring up a number of ways to enter formulas. Here is my favorite way as I find it the easiest for ALL Functions!

I am going to walk you through doing the average – but this works for all the functions

1. In a cell that you want the average in, type in “=”
2. On the left hand of the menu bar, will be a drop down menu with a list of functions. (The function menu will only display a function AFTER you type in the equal sign! Otherwise it will just display the cell you are currently in)
3. Most likely it will say AVERAGE the first time you do this because Excel tends to show them in Alpha order by the most frequently used.
4. Click on Average

Continued on the next page

5. The “functions arguments” window will pop up. Most likely there are coordinates within the “Number 1” line. Make sure those coordinates contain all the data you want to take the average from in your table.
6. You can also move the window so you can see your data, and highlight all the numbers you want to average together.
7. Hit enter. The cell now contains the average of your data that you highlighted.

Another way as you become more experienced that you may want to try

1. In a cell that you want the average in, type in “=average(“
2. Highlight all numbers that you want to get the average of.
3. Close the the parenthesis.
4. Hit enter

As you get into more advanced formulas, particularly ones you need to type in that are not pre-written for you...

I will walk you through Percent of Mass Change.

The formula is

$$\text{Percent of mass change} = \left[ \frac{\text{Final weight (g)} - \text{initial weight (g)}}{\text{Initial weight (g)}} \right] \times 100$$

1. Type in “=((“
2. Click on where your final mass is, then the “-“
3. Click on where your initial mass is, then “)”
4. Type”/”
5. Click on where you initial mass is, then “)\*100”
6. Hit Enter.

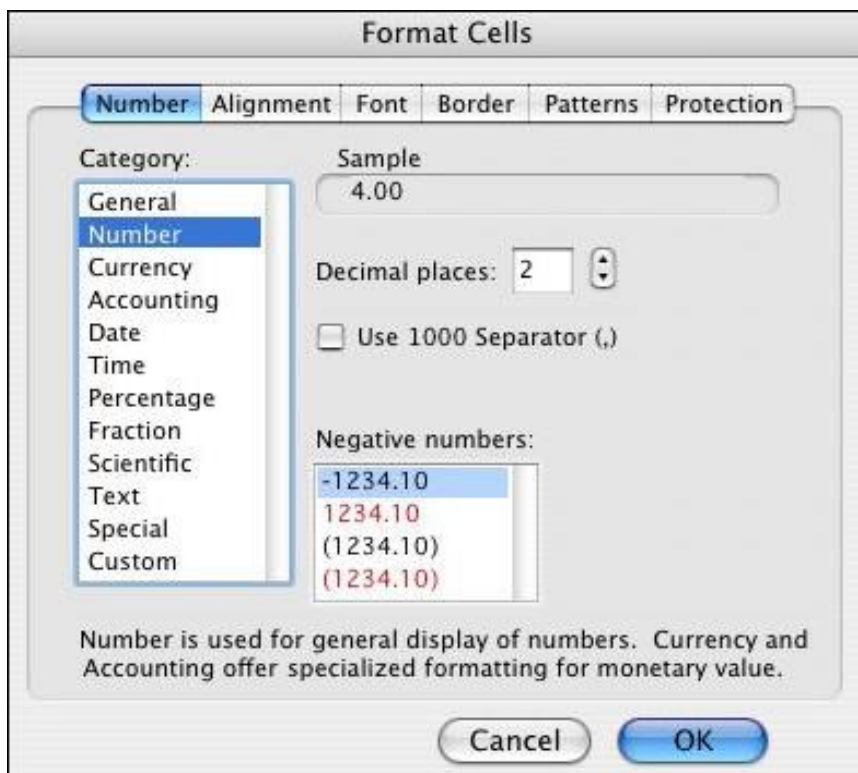
(Instead of typing “\*100” you can just format the numbers to be a percent. Formatting numbers is later in this tutorial.)

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## Format Numbers

You may want to format your numbers in a variety of ways. Perhaps you want consistent decimal places, make your numbers into percent's, or show money values...

1. Highlight any and all cells you want to format in the same way.
2. Right click
3. Choose format cells.
4. Make sure the number tab is where you are.
5. Click on number category (for example, if you want to format decimal places)
6. Change the decimal places to the appropriate number
7. Click ok.



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## Align Data

You may use this to make data centered, change the orientation, or merge data

1. Highlight any and all cells you want to format in the same way.
2. Right click
3. Choose format cells.
4. Go to alignment tab.
5. Format alignment however you need to.

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## Merge cells

To center titles, or make column headings, you occasionally need to merge several cells into one.

1. Highlight cells that you need to merge into one large cell.
2. If there is data that you have typed into one cell and need that to be in the merged cell, click on the cell that contains the data first!
3. Right Click
4. Choose format cells
5. Go to alignment tab
6. Click Merge Cells
7. I would also suggest centering horizontally and vertically at this time as well.
8. Click Ok.

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## Insert Column or Row

Sometimes you realize after you have started that you needed another row or column in the middle somewhere.

1. If inserting a column, click on a column next to where you want to insert the column to be. (If inserting a row, click on a row next to where you want to insert a row)
2. Right click
3. Choose insert

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## Create a Chart or Graph

1. Highlight the data you need to graph. (Please highlight the column headings as well. This will allow your key to include what the data is!)
2. IN THE MENU BAR, click on the insert tab
3. Click on the type of graph you would like to use.
  - a. Most likely in this class it will be an x-y scatter plot
4. When you click on insert xy scatter, you will choose the option that has data points graphed but no lines!
5. Hit Enter.
6. Your chart is now ready to be formatted.
  - a. Under the “Chart Tools” “Design tab a number of options will appear.
  - b. You first want to select the chart layout. This layout needs to include the title, axis labeled, and possibly a key
  - c. If there is only one set of data points – you may delete the key
  - d. Click into the text boxes to include your title

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## Add a Trendline

Once you have formatted your chart, you may start to add a trendline and format the data points.

1. Right Click ON one of your data points.
2. This should highlight several data points as well as show a menu that includes add trendline.
3. Click on “add trendline”.
4. Trendline options will now come up. Most times we use a linear trendline.
5. Click on the “line color” option
6. Change to color of the line to match the color of those data points.
7. Click on the “line style” option
8. Change the width of the line to be 4pt
9. Hit close.
10. Right Click a data point again.
11. Click on Format Data Series
12. Click on the marker options tab to the left.
13. Change the marker type to “built in”
14. Change the size of the data points to 2. (The individual points are not as important as the trendline is)

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## Sorting your Data

Sorting data is an integral part of data analysis. You might want to put a list of names in alphabetical order, compile a list of numbers from highest to lowest. Sorting data helps you quickly visualize and understand your data better, organize and find the data that you want, and ultimately make more effective decisions.

1. Select ALL data that needs to be sorted
  - a. NOT JUST the column you are sorting by, but all of the data that needs to go with those numbers.
  - b. ALSO the column headings should be included in your highlight.
  - c. If you only sort the column you are looking to arrange – the data attached to the original number will not go along with it!
2. On the Data tab (of the main menu bar), in the “sort & filter” group, click sort.
3. Since you included the column headings, make sure that the box is checked off that says “my data has headings”
4. Then just use the drop down menus to tell excel what to sort by and how.
5. Click ok

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## **Making a table that combines multiple cells of data into one cell – separated by commas**

There are several ways to do this. Below are three ways. Read the descriptions below the titles when deciding the best choice for you to use on your lab report.

The directions to start all of these are the same:

1. Select the range of cells that you want to combine.
2. Click **Developer >Visual Basic**, a new **Microsoft Visual Basic for applications** window will be displayed, (If you do not see developer in the standard menu tabs then:
  - a. *Either* you need to google how to see the developer tab
  - b. *Or* Try to Hold **ALT** button and press **F11** on the keyboard to open a **Microsoft Visual Basic for Application** window.)
3. Click **Insert > Module**
4. Copy the code below that you want and paste it into the module of excel

VBA

1. [Merging multiple cells into one cell with VBA code](#)
2. [Convert column list to comma separated list with VBA code](#)
3. [Write a VBA for a function of “combine” to make a table with cells combined](#)


## Merging multiple cells into one cell separated by a comma with VBA code:

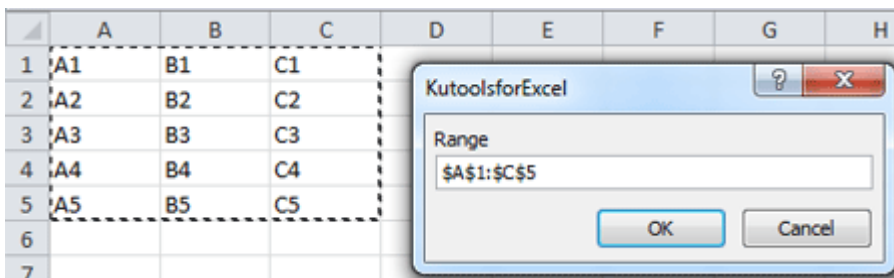
This code will actually merge the cells within your table into one cell. Once you have merged the cells it cannot be undone. You must ensure your graph is both completed and pasted into word prior to using this coding!

---

```
Sub MergeOneCell()  
'Updateby20140128  
Dim Rng As Range  
Dim WorkRng As Range  
Dim Sigh As String  
On Error Resume Next  
xTitleId = "KutoolsforExcel"  
Set WorkRng = Application.Selection  
Set WorkRng = Application.InputBox("Range", xTitleId, WorkRng.Address, Type:=8)  
Sigh = Application.InputBox("Symbol merge", xTitleId, ",", Type:=2)  
xOut = ""  
Application.DisplayAlerts = False  
For Each Rng In WorkRng  
    xOut = xOut & Rng.Value & Sigh  
Next  
With WorkRng  
    .Merge  
    .Value = VBA.Left(xOut, VBA.Len(xOut) - 1)  
End With  
Application.DisplayAlerts = True  
End Sub
```

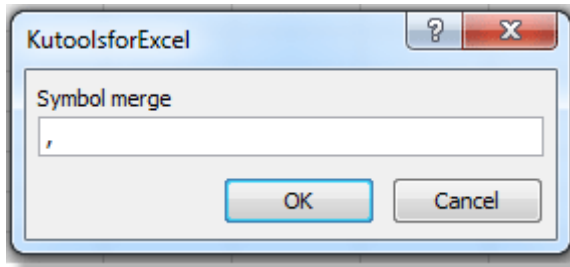
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3. Then click  button to execute the code. A dialog pops up for you to select a range to work with the VBA. See screenshots on next page:




These directions are continued on the next page

4. Click **Ok**, another dialog is displayed for you to specify the separator, in default, the separator is comma. See screenshot:



5. Click **Ok**, then the cell contents in the selected range are combined into a cell. See screenshot:

	A	B	C
1	A1	B1	C1
2	A2	B2	C2
3	A3	B3	C3
4	A4	B4	C4
5	A5	B5	C5



	A	B	C
1			
2			
3			
4			
5	A1,B1,C1,A2,B2,C2,A3,B3,C3,A4,B4,C4,A5,B5,C5		


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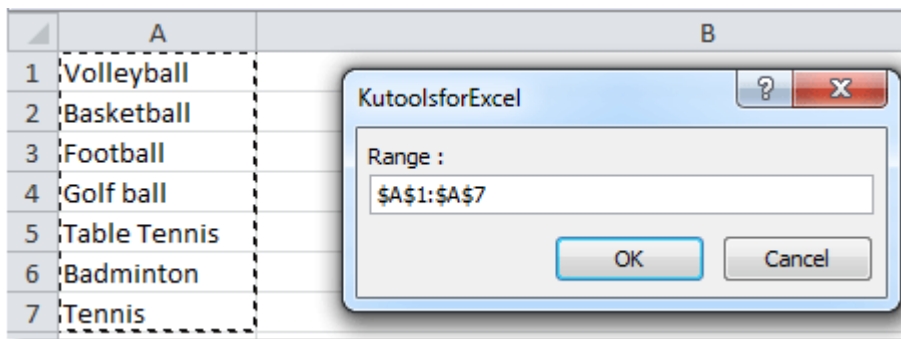
## Convert column list to comma separated list with VBA

This VBA code allows you to choose an “output” cell. Meaning – you keep your original table and make a separate table for the merged cells table

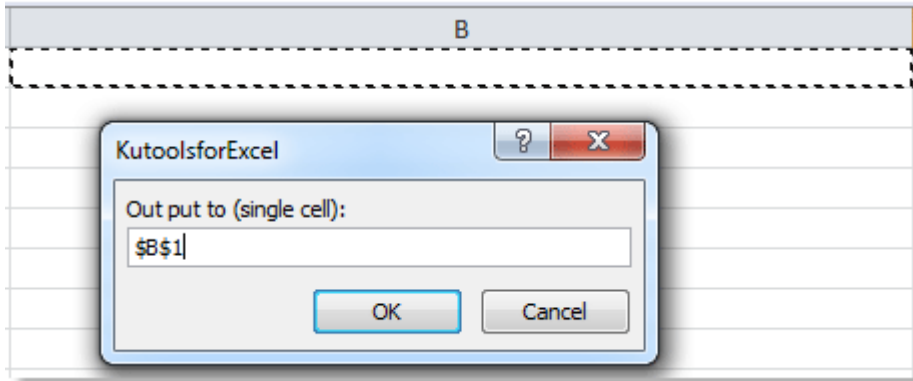
```
1 Sub ChangeRange()  
2 'Updateby20140310  
3 Dim rng As Range  
4 Dim InputRng As Range, OutRng As Range  
5 xTitleId = "KutoolsforExcel"  
6 Set InputRng = Application.Selection  
7 Set InputRng = Application.InputBox("Range :", xTitleId, InputRng.Address, Type:=8)  
8 Set OutRng = Application.InputBox("Out put to (single cell):", xTitleId, Type:=8)  
9 outStr = ""  
10 For Each rng In InputRng  
11 If outStr = "" Then  
12 outStr = rng.Value  
13 Else  
14 outStr = outStr & ", " & rng.Value  
15 End If  
16 Next  
17 OutRng.Value = outStr  
18 End Sub
```

3. Click  **Run** button or press **F5** to run the VBA.

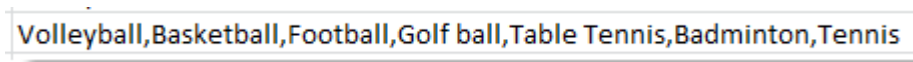
4. A dialog displayed on the screen, and you can select the column list you want to convert. See screenshot:



5. Click **OK**, then another dialog popped up for you to select a cell. See screenshot:



6. Click **OK**, and all values in the column list have been converted to a list separated by comma in a cell. See screenshot:



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## Combine cells based on row or column into one with commas:

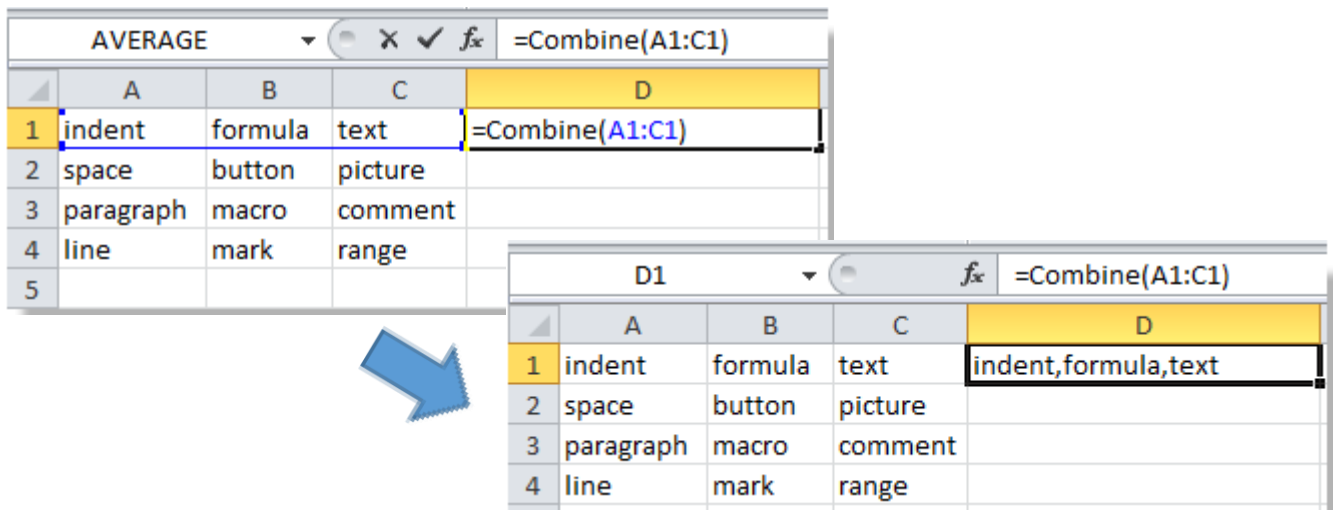
In Excel, you can also use function to combine cells of row or column into a single cell with spaces or specified marks.

```
1 Function Combine(WorkRng As Range, Optional Sign As String = ", ") As String
2 'Update 20130815
3 Dim Rng As Range
4 Dim OutStr As String
5 For Each Rng In WorkRng
6     If Rng.Text <> ", " Then
7         OutStr = OutStr & Rng.Text & Sign
8     End If
9 Next
10 Combine = Left(OutStr, Len(OutStr) - 1)
11 End Function
```

FROM HERE YOU DO NOT HIT RUN AS THE OTHERS.

You have now made yourself a new function. Simply toggle go back to your sheet

1. Type the formula `=Combine(` in a blank cell,
2. Highlight the cells you want to combine and then close the parenthesis
3. Press **Enter** button in the keyboard, and the data in cells highlighted will be merged into a cell and separated by commas. See screenshot:



	A	B	C	D
1	indent	formula	text	=Combine(A1:C1)
2	space	button	picture	
3	paragraph	macro	comment	
4	line	mark	range	
5				

	A	B	C	D
1	indent	formula	text	indent,formula,text
2	space	button	picture	
3	paragraph	macro	comment	
4	line	mark	range	

4. Dragging the fill handle over the range that you want to apply this formula, all of the cells in the row will be combined into a cell with commas. See screenshot:

	A	B	C	D
1	indent	formula	text	indent,formula,text
2	space	button	picture	space,button,picture
3	paragraph	macro	comment	paragraph,macro,comment
4	line	mark	range	line,mark,range

**Tip:** With above User Defined Function, you can also combine cell values based on column, you just need to enter this formula `=Combine(A1:A4)` after copying above code into the **Module**.

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