

## Excel Primer

1. **What is Excel?** It is **spreadsheet** software. Excel allows you to enter (record), manipulate and analyze data.  
Alternatives (Quatro Pro, Google Docs and Spreadsheet)
2. **How to enter data into Excel**
  - a. One cell can hold one number or one “chunk” of text (e.g. last name, full name, country name, a sentence)
  - b. To enter data,
    - i. Choose a cell either by clicking on it or by moving the cursor to the cell,
    - ii. Type in whatever you want to type into that cell
3. **How to enter formulas**
  - a. **NOTE: All formulas MUST start with =**
  - b. **You can simply type in a formula.**

**Example:**

    - i. Select cell B5
    - ii. type in  $=a1+a2$   
This will add the content of A1 and A2 and display the result in cell B5
  - c. **You can use the mouse to enter a formula.**

**Example:**

    - i. Select cell B5
    - ii. type in =
    - iii. Click on cell a1
    - iv. Type in +
    - v. Click on cell a2  
This will add the content of A1 and A2
  - d. **You can use arrow keys to enter a formula.**

**Example:**

    - i. Repeat the same steps as in the previous example but instead of pointing with the mouse, use arrow keys to choose the cells you want to add.
4. **How to edit/audit formulas**
  - a. Double click on the cell that contains the formula – that will open it for editing
  - b. Move with arrow keys to select the cell you want to edit. Press F2
  - c. **NOTE:** if you double click (or press F2) on the cell with the formula for edit, parts of the formula will be colored with the colors corresponding to the cells used in this formula
  - d. **NOTE:** if you already opened a cell for editing, F2 will toggle Edit/Enter modes.

## 5. Basic Formulas

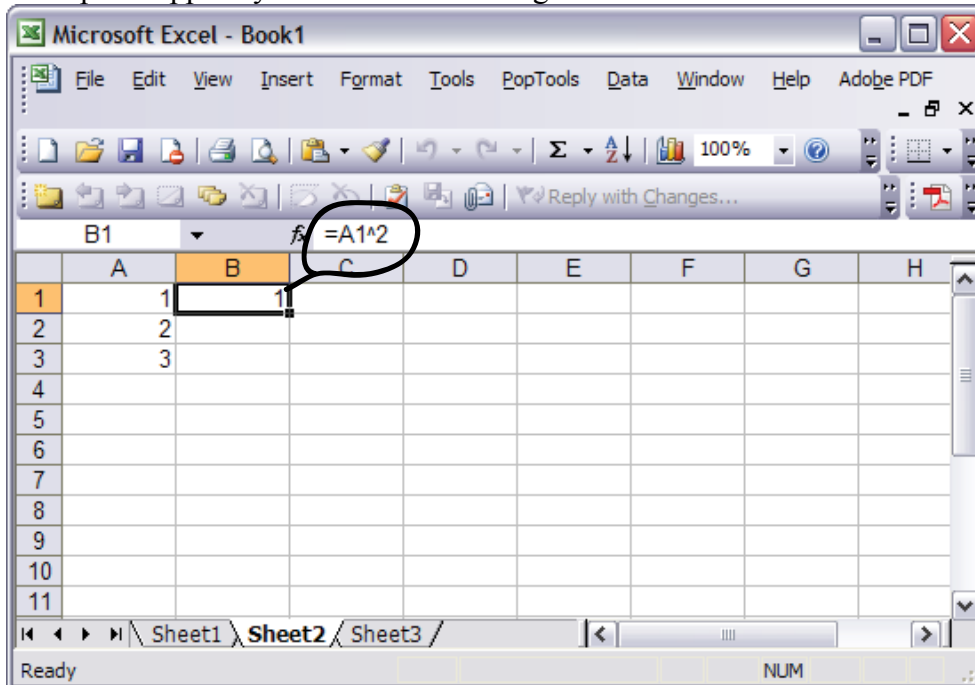
- a. Addition                    = A1+A2
- b. Multiplication            = A1\*A2
- c. Division                   = A1/A2
- d. Power                      = A1^A2
- e. Square root                = sqrt(A1)
- f. Exponential                = exp(a1)
- g. Natural Logarithm        = log(a1)
- h. Sum                         = Sum(a1,a2,a3) or =Sum(a1:a3)

## 6. Deleting/Inserting/Moving cells/columns/rows

- a. To add a row click on the row number where you want to add the row and press CTRL and “+” key (if you are using a laptop then press ctrl-shift-“=”)
- b. To delete a row click on the row you want to delete and press CTRL and “-” key
- c. If you want to add/delete a column, follow the same steps as above, except now you have to click on the column, not the row.
- d. If you want to add/delete the *contents* of the cell, simply choose the cell and press DELETE key
- e. If you want to add/delete a cell or a range of cells (this operation will shift other cells in the worksheet) click on the cell where you want to add/delete and press CTRL “+”/“-“. You will be given a choice how you want to shift other cells in your worksheet.
- f. If you want to move a cell/column/row/range of cells, simply click on it and drag it with the mouse.

7. **Copying the formulas.** If you have to recalculate the same formula many times, you don't need to retype it – you can copy it.

Example: Suppose you have the following data in a worksheet:

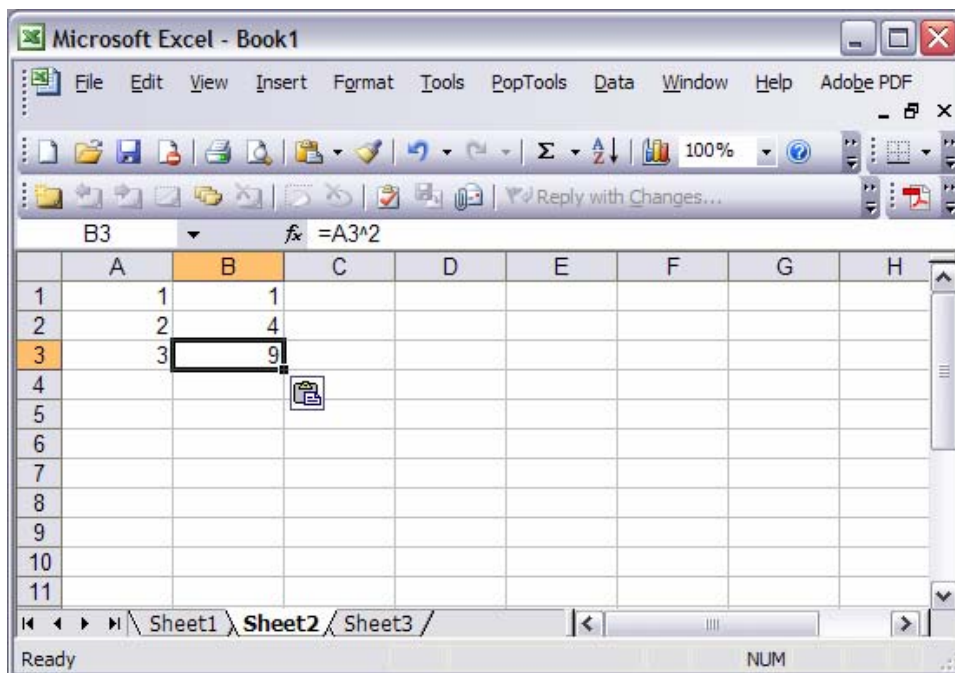


You have entered a formula  $=A1^2$  into B1 cell and you want to calculate the same formula for a2, a3 and place the formulas into b2 and b3 respectively.

To do that,

1. select B1 cell, hit CTRL-C or CTRL-INS to select the cell (notice – selected cell will have moving border around it).
2. Select cells b2 and b3 by dragging the mouse or by pressing SHIFT-ARROW KEYS.
3. Hit CTRL-V or SHIFT-INS.

As a results you should get the following:

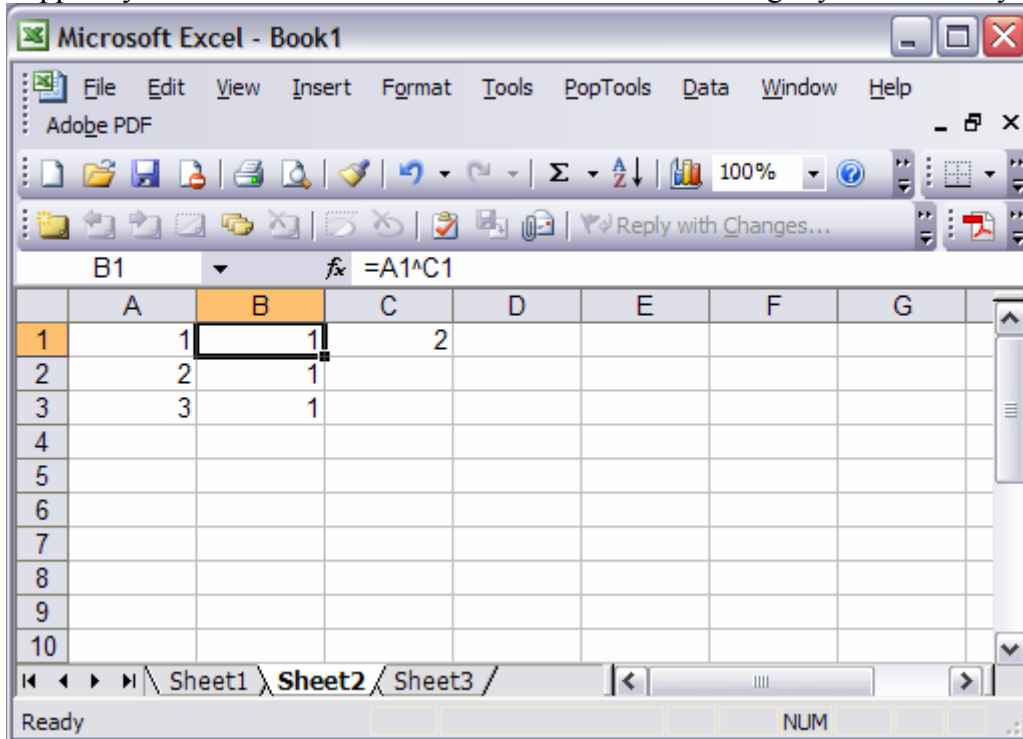


Notice that the formula in B3 was “updated” – it used the data from cell A3.

**Note** To cancel the [moving border](#) after you finish copying, press ESC

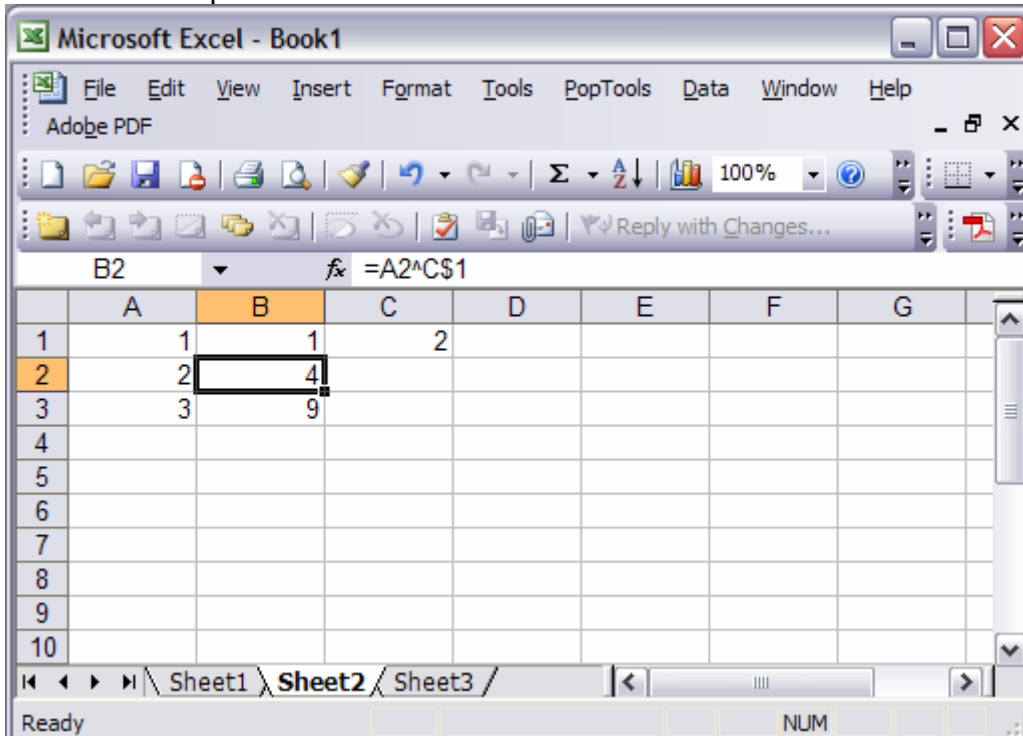
## 8. Copying the formulas – keeping cells “constant”

Suppose you want to calculate the same formula but in a slightly different way:



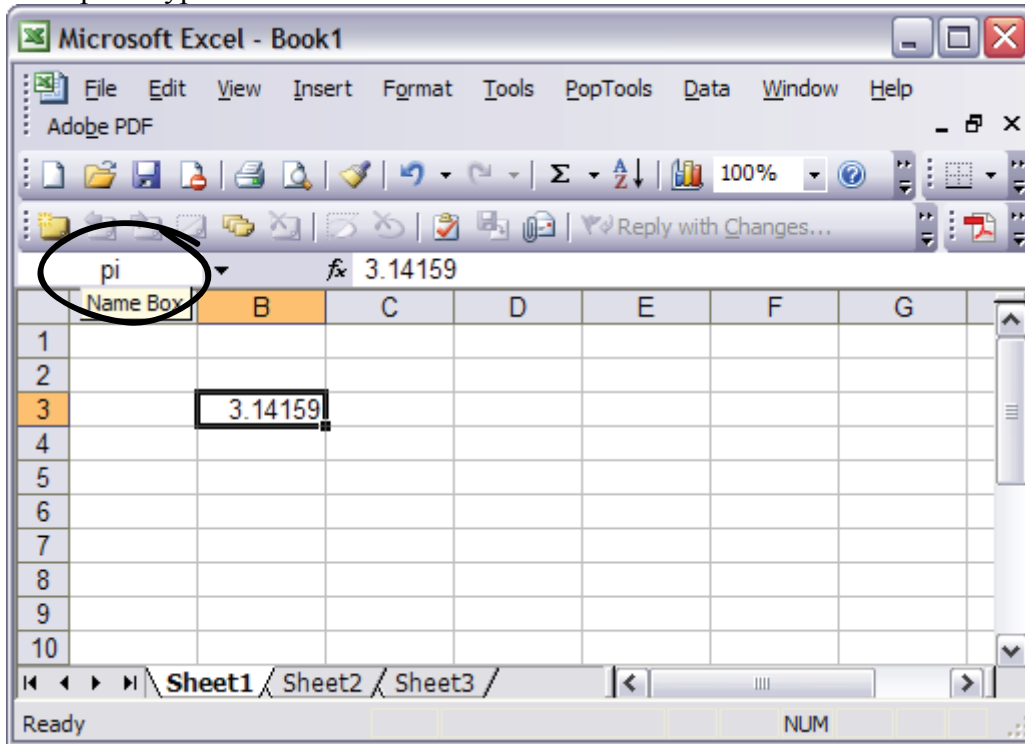
The difference between this example and the previous one is that instead of raising the A1 to the power of 2 you raise it to the power of whatever is in the cell C1 (which happens to be 2). But if you copy this formula down, C1 will become C2 – and because that cell is empty, in effect you are raising A2 to the power of 0. So, what we want is for one part of the formula to be updated during copying while other part stays constant.

There is a way to update only a part of the formula: If you put a \$ in front of the part of the formula you want to keep constant, Excel will know not to update this formula. So if you enter  $=A1^C\$1$ , Excel will not update the row number of that cell:



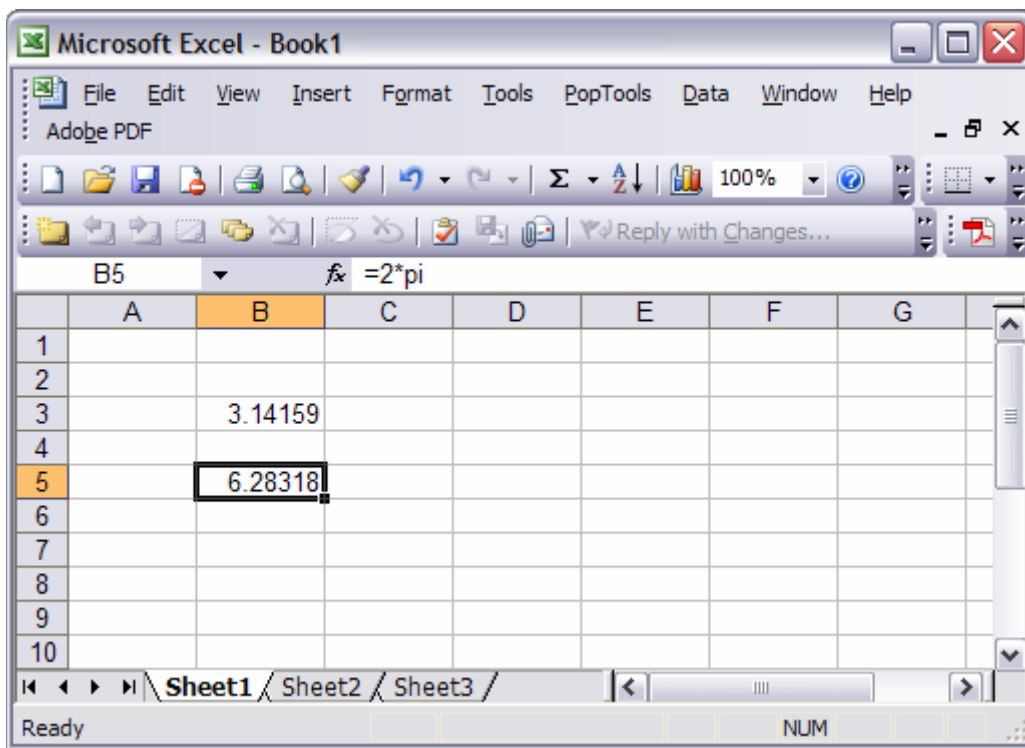
There are **three options**: A\$1 will update the column but not the row, \$A1 will update the row but not the column, \$A\$1 will keep both constant when copying the formula.

9. **Naming cells and ranges.** You can name a cell or a range of cells. Later you can refer to this cell by using the name you gave it.  
Example: I typed in 3.14159 in a cell b3.



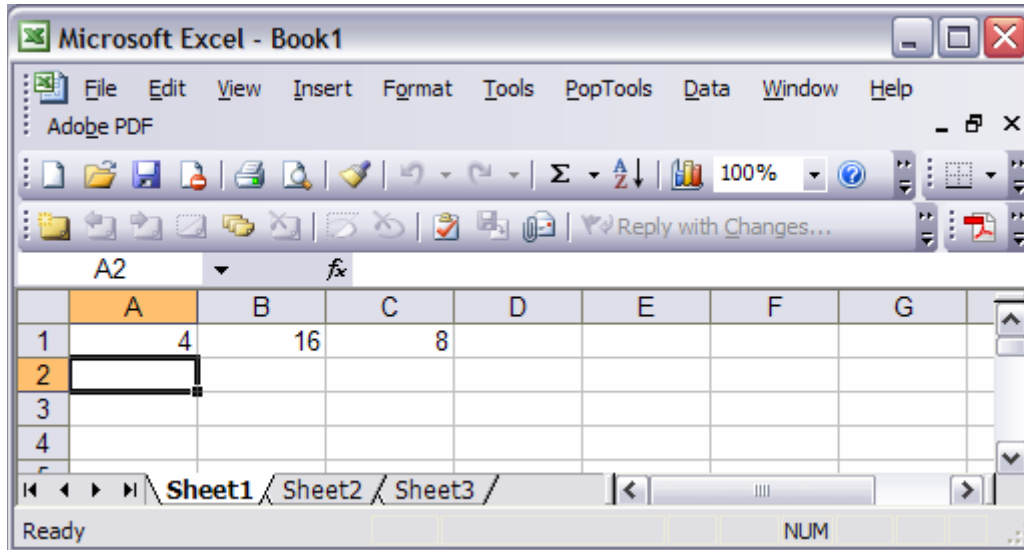
In the top left corner, there is a Name Box. In that box I typed in a name for the cell B3 – “pi.”

Now, when typing the formulas I can refer to that cell by its name:

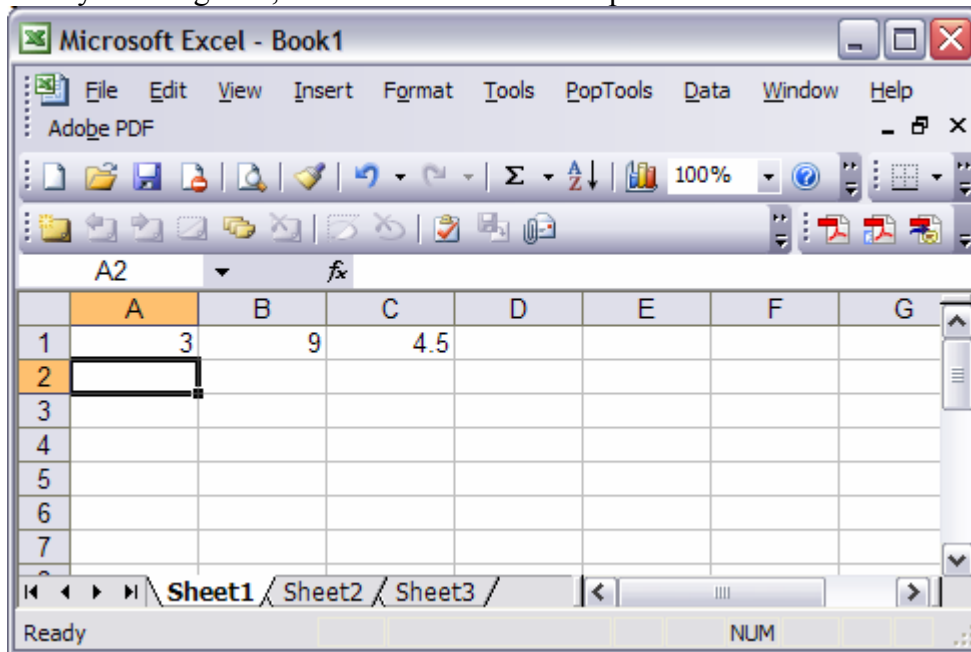


10. **Formulas can be linked to other formulas:**

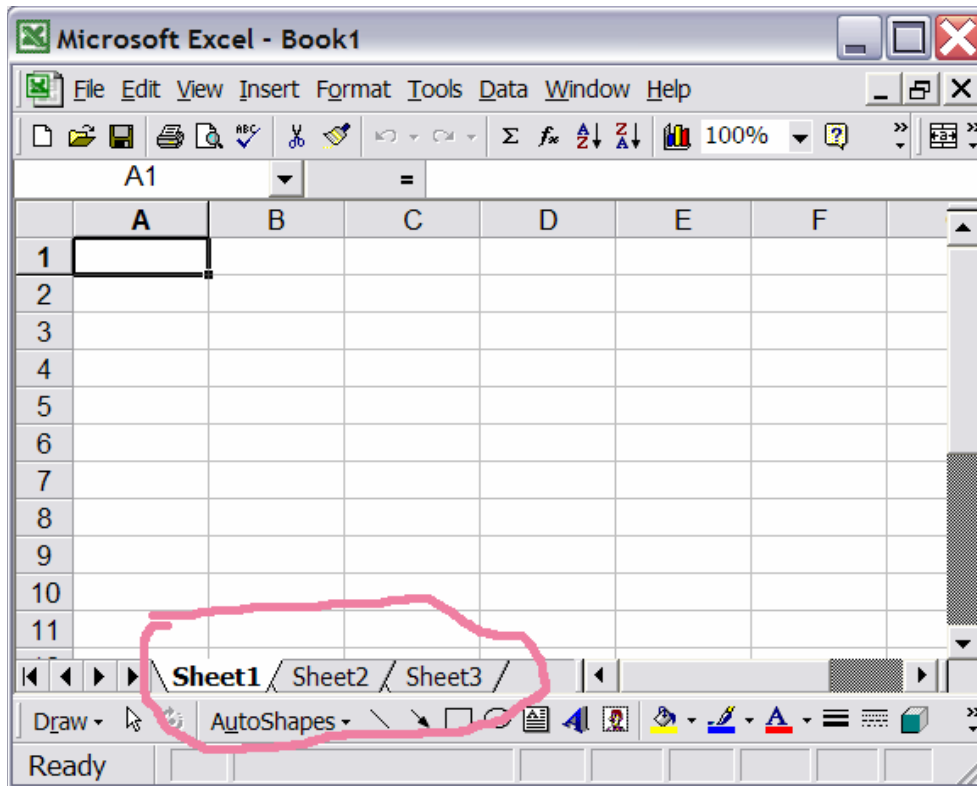
Example: Suppose in cell A1 you typed in 4, in cell B1 you typed in  $=A1^2$ , then in cell C1 you typed in  $=B1/2$ :



You can see that formula in C1 used what's in B1.  
So if you change A1, both B1 and C1 will be updated:



11. **Sheets.** Excel files consist of worksheets. Normally when you open a blank Excel file, it will have three worksheets. You can think of them as three separate tables that can be linked. The picture below shows the tabs for the sheets in the excel file. By clicking those tabs you can access the worksheet with the file.



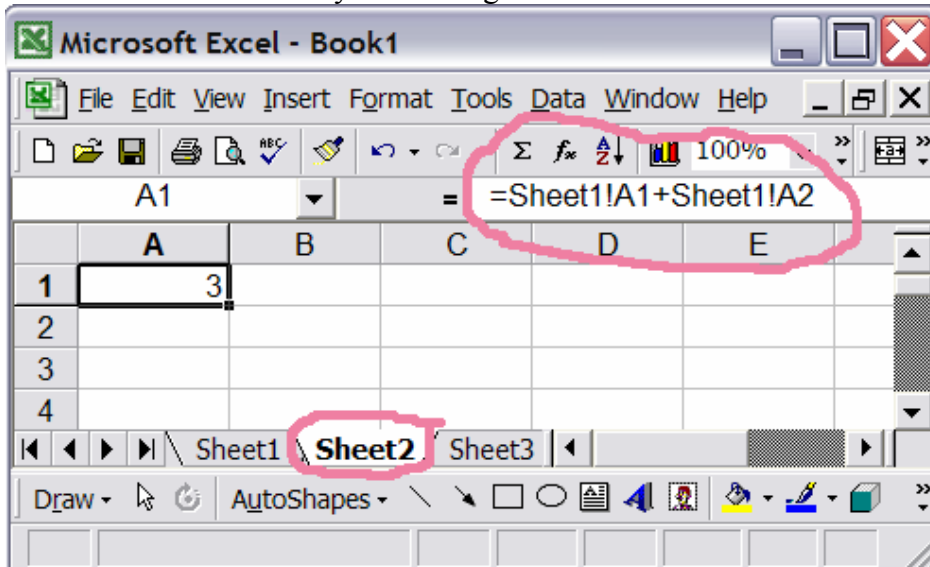
You can

- a. rename sheets by double clicking on its name,
- b. add/delete sheets by clicking the right button.

12. **Creating formulas using data from different sheets.** Suppose in the Sheet 1 I have some data but I want to have a formula in Sheet2 that uses data from Sheet1. The easiest way to it is to create formulas using the mouse. For example, in Sheet1, in cells A1 and A2 you have numbers 1 and 2. You want to add them together in cell A1 in Sheet2.

- a. Select cell A1 in Sheet2
- b. Start entering the formula by typing =
- c. Click on Sheet1 and in Sheet1 on cell A1,
- d. Type +
- e. Click on Sheet1 and in Sheet1 on cell A2.

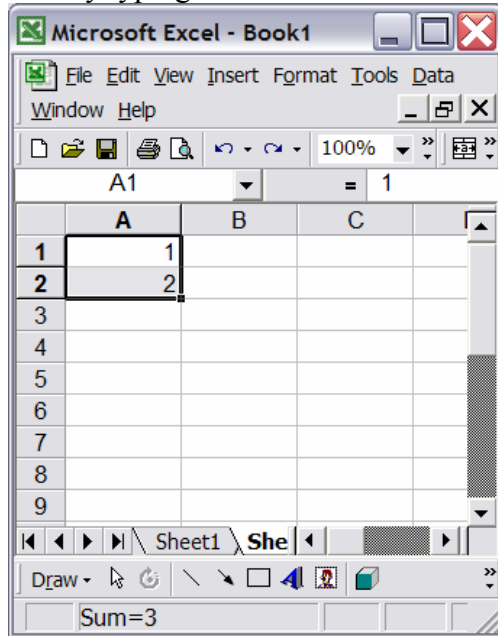
In the end you should get this:



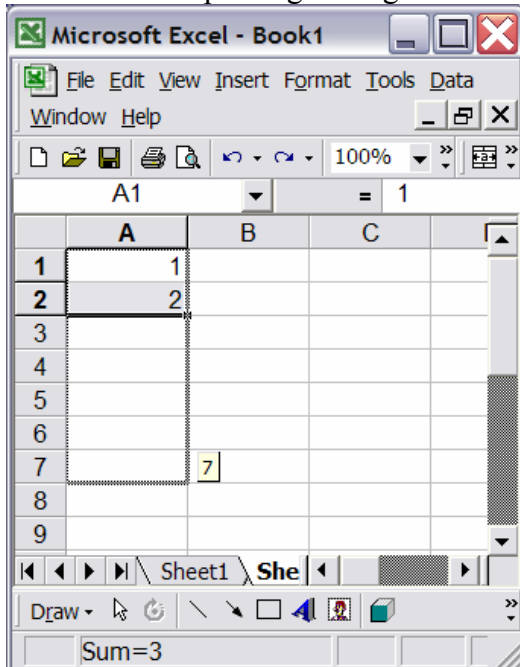
**Note:** You can also use data from other files. Most of the time this technique works but sometimes it fails – I would recommend abstaining from it unless you really know what you are doing.



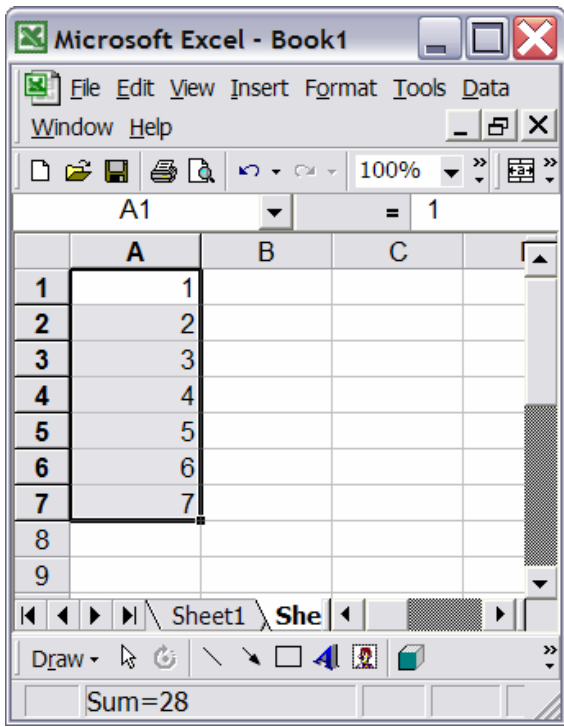
12. **Generating Lists.** If you need to create a table with the some sequence – 1,2,3,4,5... or 2001,2002,2003,..., Excel can do it automatically. Start by typing the first two numbers in the sequence and selecting the cells where you typed them.




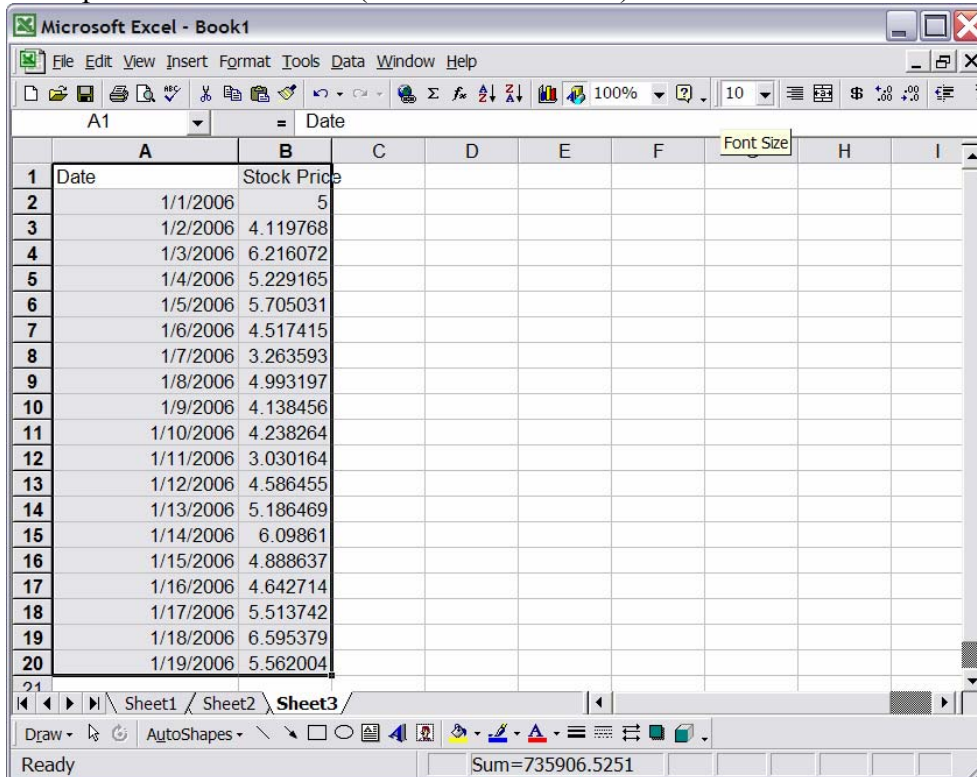
Move the mouse pointer over the little square in the bottom right corner of the selection. The pointer will turn into a plus sign. Drag the selection as long as you want your sequence to be:



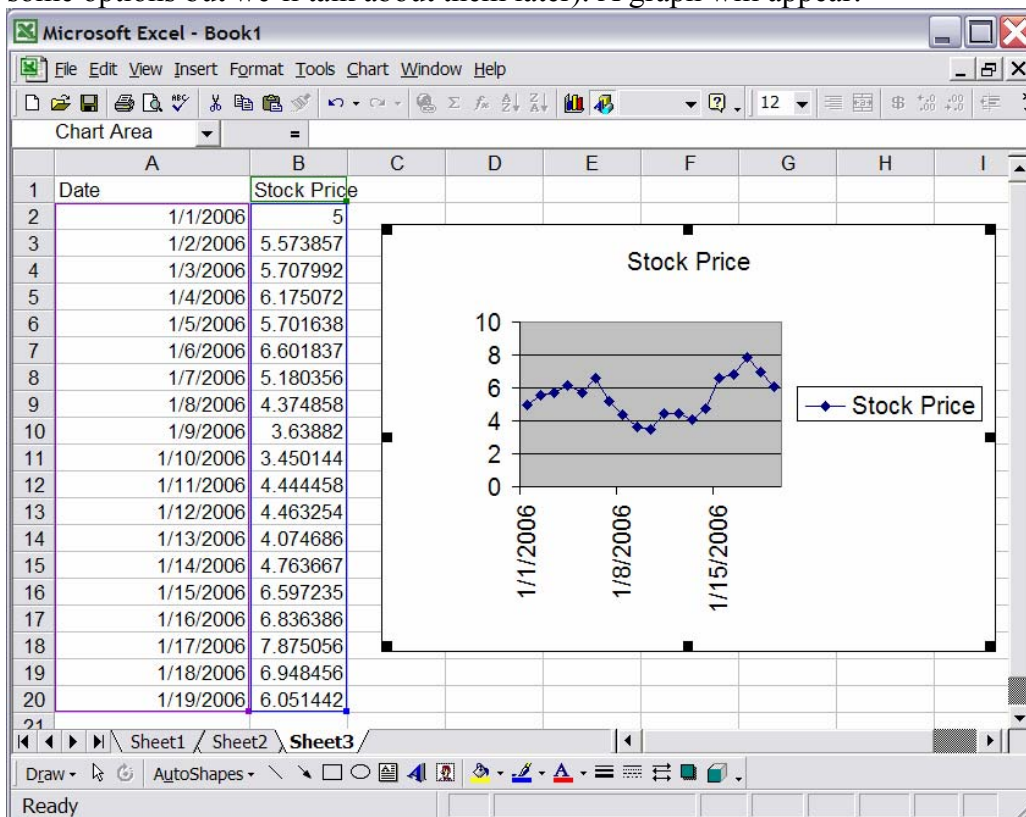
In the example above, the Excel will create a sequence of numbers 1 through 7:



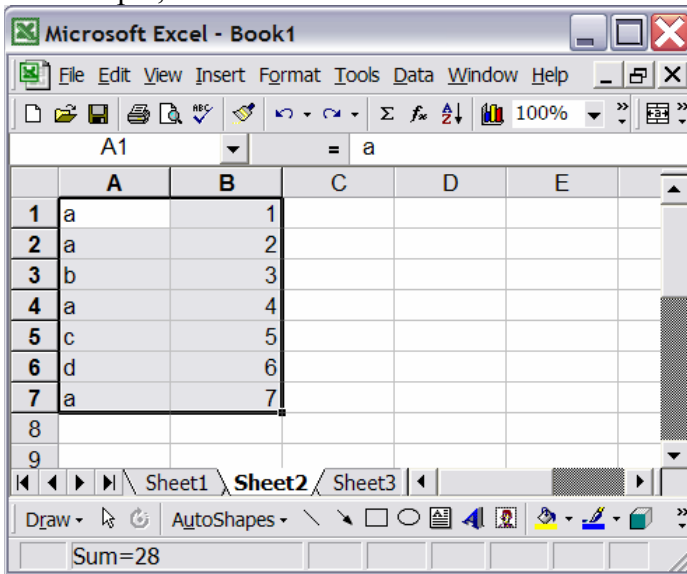
13. **Graphing.** Excel has very good graphing capabilities. Below is an example of a time-series plot of a stock price. Select the data (notice column titles) and click the  button.



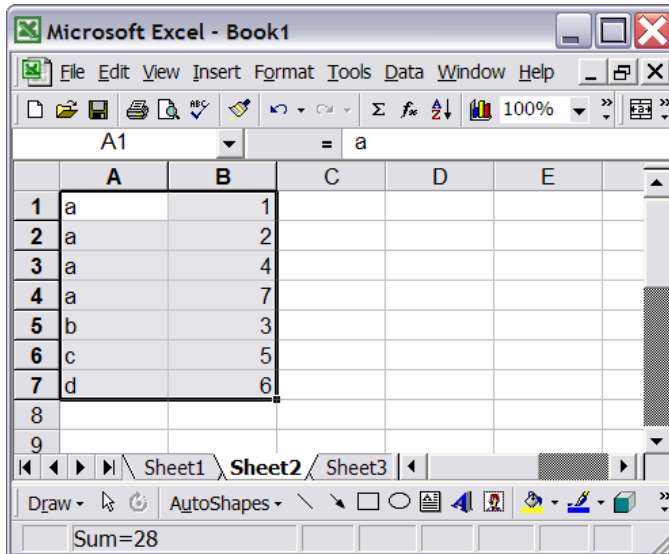
When a menu appears, choose Line Graph and click next next next then finish (you will skip through some options but we'll talk about them later). A graph will appear:



**14. Sorting.** When you need to sort data, select the range that needs to be sorted and click the sort button:  
For example,



becomes



For more advanced sorting options click Data→Sort... in the main menu

15. **Filter.** You can limit what data are displayed by using the filter in excel. Click on Data→Filter→Autofilter. At the top of the columns in your data will appear a pull down menu with the choices of filtering data.

Using the last example, I can filter the data so that only “a”'s appear in the column:

