**GETTING STARTED WITH EXCEL**

Excel has a wealth of tools and functionality to facilitate modeling. Too much, in fact, to cover in this text. You should become comfortable with investigating the Excel visual development environment on your own. Indeed, this is the only way to really learn Excel. Nevertheless, this study guide should help is pointing you toward those capabilities of Excel that are widely used in modelling.

The primary functionality of Excel is its library of hundreds of built-in functions. To view a list of these functions, click on the fx icon.



Highlighting a function name will show a brief description, the parameter list and provide a link to the associated help file. You should take some time to familiarize yourself with Excel’s help files. They provide a wealth of information, including function formulas, to speed development.

* **Things You Should Be Familiar With**

An Excel spreadsheet application contains a workbook, which is a collection of worksheets. There are many, many built-in functions in Excel. Some of them are related to financial topics, for example, IRR(), DURATION(), NPV(), PMT(), and ACCINT().

You should be careful when using any Excel function as the formula used for calculation may be different from what you expect. Never assume that a function calculates something the way you think it does. Always verify the formula using the help files.

Spreadsheet errors are pervasive. Laboratory studies and field examinations of real-world spreadsheets have confirmed that developers make uncorrected errors in 2%-5% of all formulas. Consequently, nearly all large spreadsheets are wrong and in fact have multiple errors. Spreadsheet error rates are very similar to those in traditional programming. Be sure to test your spreadsheet calculations. Testing should consume 25%-40% of your development time.

￼Here is a brief list of built-in Excel functions you should be familiar with:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| AVERAGE | COVAR | EXP | LOG | NORMSDIST | SUM |
| CORREL | DATE | IF | MAX/MIN | RAND | TRANSPOSE |
| COUNT | DAYS360 | INTERCEPT | MINVERSE | SLOPE | VAR |
| COUPDAYSBS | DURATION | LINEST | MMULT | STDEV | VLOOKUP |

You should look at the descriptions and help files of these functions as well as the many others. You will not be able to memorize all the Excel functions, so the key is to know what kinds of functions are available in Excel and find them quickly.

To use a function, simply type = into cell, then the function name, then the parameters, or input arguments. For example:

The return value of the function will appear in the cell.

Some functions require an array of data as a parameter. This is accomplished using ranges. Usually we set these parameters by pointing and clicking on a cell, rather than by typing the code. For example, given values in cells A1 through A5, the sum of these values can be calculated in cell B1 as:

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Some functions accept more than one parameter, which are separated by commas. If a cell used as an input argument is in another worksheet, the cell reference is preceded by the sheet name. For example:

Matrix functions often return arrays. To make this work, highlight the entire range, type in the function, and press Control-Shift-Enter. For example, given a matrix of values in cells A1 to B2, we can put the transposed matrix into cells C1 to D2 by highlighting C1 to D2, entering the formula, and then pressing Control-Shift-Enter:

. Other matrix functions include MMULT, MINVERSE, and MDETERM.

* **Working with Cells**

So far we have looked at absolute cell referencing. An absolute reference uses the column letter and row number. Relative cell referencing shows the number of rows and columns up and to the left of the current cell. For example, if R1C1 Reference Style is turned on, this formula refers to the cell one row up and one column to the left:

To turn on the R1C1 Reference Style, go to the Office Button | Excel Options | Formulas and click it on. In general, relative referencing is confusing, and absolute referencing is preferred.

Often times we need to copy formulas over some range. This is easily done, by left-clicking on the square in lower right-hand corner of the highlighted cell and dragging downward. In this example, cell B1 contains the formula: .

After copying this formula down, cell B8 contains:



Notice that the first cell in range reference is locked using the dollar signs, $A$1. This means that as you copy formulas to adjacent cells, neither the column nor the row in the first reference will change. Clicking on F4 iterates through the four possible combinations of fixed cell references. For example: A1, no lock. $A1, only column locked. A$1, only row locked. $A$1, both column and row locked.

Sometimes we like to use named ranges. Rather than using cell references then, we can use the range name as a parameter instead. For example, we can name cell A1 as Rate in the name box.



Then, in cell B2 we can use this value as a parameter thusly:

Of course, you can always do your own math in Excel using operators to implement a formula. For example, the simple present value equation can be implemented as follows:

* **Working with Data**

Often times we use Excel to store data. This is convenient especially in light of Excel’s look-up functionality, which searches for a value in a data table based upon a condition. Here is a simple example:



In this example, cell F3 contains the following formula:

In VLOOKUP function call (V stands for vertical, there is also HLOOKUP for horizontal), E2 is the look-up condition. A3:B6 is the table range. 2 indicates to compare the look-up condition to column one in the data table and return the corresponding value from column two. True as the last parameter compares on an exact or approximate match is returned. False returns only an exact match. The values in the data table must be in ascending order, or it may not work right.

* **Working with Dates and Times**

If we enter a date into Excel, say 01/09/2011, we can format its appearance in several ways by right-clicking and selecting Format Cells... However, Excel itself keeps track of the data as an integer value. We can use Excel’s built-in date functions to perform date calculations. For example, to find the amount of time between two dates:



Cell A3 contains the number of days between the two dates using either:

The formula in cell A4 is:

For information on the parameters for the YEARFRAC function, see the Excel help files.

* **Other Functionality**

You should also familiarize yourself with other capabilities of the Excel visual development environment. Most often, there is more than one way to accomplish any particular task. And, many times there are wizards and visual cues to walk you through development. For example, some of the following are also available by highlighting an Excel range and right-clicking.

|  |  |  |
| --- | --- | --- |
| **What** | **How** | **Description** |
| Saving Files | File Menu or Toolbar | Opening and saving Excel files |
| Copy / Paste | Edit Menu or Toolbar | Editing cells and worksheets |
| Cell Formatting | Format Menu or Toolbar | Changing cell appearance, also setting decimal style |
| Adding Toolbars | View | Toolbars | Using tools available in other toolbars |
| Excel Options | Tools | Options | Changing default Excel settings |
| Charts | Chart Wizard Icon | Creating charts in Excel using the Chart Wizard |
| Sorting Data | Data | Sort or Icon | Sorting data ascending or descending |
| Auditing | Tools | Formula Auditing | Trace cells that are inputs into a formula, or other cells that depend on the current cell |
| VBA Editor | Tools | Macro | Visual Basic Editor | Launch the VBA development environment |