

Using Filters in Microsoft Excel 2003

Introduction

Microsoft Excel provides a very simple mechanism (autofilter) for selecting data subsets. Autofilters can be set up to choose specific values or a range of values. Several filters can be used, each acting further on the current data subset. An advanced filter is provided for more complicated selections.

Autofilters

The simplest way to understand how autofilters work is to try them out on an example file:

1. Load up Excel and **[Open]** the file called [phoenix.xls](#) in the **D:\training** folder
2. Make sure the active cell is within the set of data (eg click on cell *A1*)
3. From the **Data** menu choose **Filter** followed by **AutoFilter**

Filter arrows are now attached to the column headings in row 1. Filtering textual data and numeric data is usually slightly different and is dealt with in turn below.

Filtering Text

1. Click on the *filter arrow* attached to cell *F1* and choose **Blue-Green**

You now only have the rows whose colour is Blue-Green. Note the row numbering down the left hand side of the screen has turned blue, as has the filter arrow attached to cell *F1*. These changes indicate that a filter is in operation. Note also that the number of filtered records displayed is shown in the bottom left corner of the Excel window - here it says *21 of 50 records found*.

To redisplay all the data:

2. Click on the *filter arrow* attached to cell *F1* and choose **(All)**

This first example was very simple; next set a filter for more than one value:

3. Click on the *filter arrow* attached to cell *G1* and choose **(Custom...)**
4. Click on the *list arrow* attached to the upper box on the right and choose **BN**
5. Click on the **Or** option button
6. Click on the *list arrow* attached to the lower box on the left and choose **equals**
7. Click on the *list arrow* attached to the lower box on the right and choose **BRV**
8. Press **<Enter>** or click on **[OK]**

Here you have data rows where collector matches *either* BN *or* BRV. Note that you cannot have more than two matches using autofilter - for three or more values you have to use an advanced filter. However, other matching criteria (apart from 'equals') may give you the results required:

9. Click on the *filter arrow* attached to cell *G1* and choose **(All)**
10. Click on the *filter arrow* again and choose **(Custom...)**
11. Click on the *list arrow* attached to the upper box on the left and choose **does not equal**
12. Into the upper box on the right type ***R*** (the * is a wildcard, as explained on screen)
13. Press **<Enter>** or click on **[OK]**

Only collectors without an *R* as an initial are displayed (29 records). You might have thought that the *R* needed to be surrounded by other characters, such that collector *RFA* would have been shown. To see what's gone wrong:

14. Repeat step **10** and note that Excel has changed the criteria to **does not contain R**
15. Repeat steps **11** to **13** but this time set a match of **?*R*?**

The ? stands for a single character, indicating that Excel shouldn't apply the criteria to the first (or, in this case, last) character in the text. You now have 41 records, including collector *RFA*.

Here's another example:

16. Click on the *filter arrow* attached to cell *G1* and choose **(Custom...)**
17. Click on the *list arrow* attached to the upper box on the left and choose **is greater than**
18. Click on the *list arrow* attached to the upper box on the right and choose **BRV**
19. Make sure the **And** option button is set on
20. Click on the *list arrow* attached to the lower box on the left and choose **is less than**
21. Click on the *list arrow* attached to the lower box on the right and choose **RFA**
22. Press **<Enter>** or click on **[OK]**

Note that *greater than* and *less than* work with words (alphabetically). Only the records for collectors CDS and FLC are displayed (BRV and RFA, used in the criteria, are *not* included). Note also the options *begins with* (and *does not begin with*) and *ends with* (and *does not end with*) which work exclusively with textual data. Incidentally, you cannot reference a cell or calculate a value in the boxes on the right.

21. Click on the *filter arrow* attached to cell *G1* and choose **(All)**

Filtering Numbers

If you tried to repeat the first exercise on numeric data you would be faced with a long list of different values. Here, each number is unique (whereas *colour* can be only one of two values and *collector* one of five). If you select one value from the list you will get just the one row. In these circumstances, you have to customise your filter:

1. Click on the *filter arrow* attached to cell *D1* and choose **(Custom...)**
2. Click on the *list arrow* attached to the upper box on the left and choose **is greater than**
3. Click in the upper box on the right and type **8**
4. Press **<Enter>** or click on **[OK]**

The 23 records displayed have a diameter value greater than 8. You can find data less than a particular value using *is less than*, or data between two values using two criteria and the *And* option. To find data outside a range the *Or* option must be used:

5. Click on the *filter arrow* attached to cell *D1* and choose **(Custom...)**
6. Check that *is greater than 8* is still set and make sure the **And** option is set on
7. Click on the *list arrow* attached to the lower box on the left and choose **is less than**
8. Click in the lower box on the right and type 10
9. Press **<Enter>** or click on **[OK]**

Only 20 records should now appear - those between 8 and 10. To see just the other 30 values:

10. Click on the *filter arrow* attached to cell *D1* and choose **(Custom...)**
11. Click on the *list arrow* attached to the upper box on the left and choose **is less than**
12. Turn on the **Or** option
13. Click on the *list arrow* attached to the lower box on the left and choose **is greater than**
14. Press **<Enter>** or click on **[OK]**

An alternative filter is shown as **(Top 10...)** - the largest 10 values. Options here also let you choose more or less than 10 values, the bottom 10 values, or a percentage (eg top 10%).

Multiple Filters

In the examples to date, a filter has been applied to a single column of data but several filters on different columns can be set. With the data still filtered for diameter between 8 and 10cm:

1. Click on the *filter arrow* attached to cell *G1* and choose **RFA**
2. Click on the *filter arrow* attached to cell *F1* and choose **Red-Brown**

You now have three filters in operation. Each of these can be turned off individually by using the filter arrows attached to the heading cells and choosing **(All)**. To turn off all filtering in a single step:

3. Open the **Data** menu, select **Filter** then **Show All**

To turn off the autofilter arrows:

4. Open the **Data** menu, select **Filter** then **AutoFilter**

Advanced Filtering

Advanced filters allow you to construct more complicated filters. They work by creating two special cell ranges - one defines the data area and the other the filter criteria. The filter criteria can be created anywhere on the spreadsheet, but the convention is to place them above the data area (to match autofilter). The first step, therefore, is to create space above the existing data:

1. Drag through row numbers **1** to **5** down the far left-hand side of the worksheet
2. Open the **Insert** menu and select **Rows** - 5 blank rows should appear

Next set up the filter area, in which the column headings are repeated in the top row with criteria typed into the rows below.

3. Click on the **6** of row 6 to select the row of column headings
4. Click on the **[Copy]** button (or use **Copy** from the **Edit** menu)
5. Click in cell **A1** and press **<Enter>** to **[Paste]** in the headings
6. Click in cell **F2**, type **Blue-Green** and press **<Enter>**

You now have a very simple filter set up - one matching the first autofilter example. To run it:

7. From the **Data** menu choose **Filter** followed by **Advanced Filter...**
8. Set up the *List Range:* as **A6:G56** and the *Criteria Range:* as **A1:G2**
9. Press **<Enter>** or click on **[OK]** to carry out the filter

Having seen how advanced filtering works, here's a more complicated example. Each row in the criteria range can be set up to give a particular criterion (similar to the *Or* option you met earlier), while within each row, more than one test can be applied (equivalent to *And*).

10. Click in cell **D2**, type **>8** and press **<Enter>**
11. From the **Data** menu choose **Filter** followed by **Advanced Filter...**

12. Press **<Enter>** or click on **[OK]** to run the filter - the *List* and *Criteria* ranges are the same
13. Next, click in cell *D3* and type `<8`
14. Click in cell *F3*, type `Red-Brown` and press **<Enter>**
15. From the **Data** menu choose **Filter** followed by **Advanced Filter...**
16. Amend the *Criteria Range:* to `A1:G3`
17. Press **<Enter>** or click on **[OK]** to carry out the filter

You now have rows where the diameter value is less than 8 and the colour red-brown plus rows with the diameter more than 8 and the colour blue-green. This couldn't be achieved using autofilter.

If you need to find data between two values in an advanced filter then you have to duplicate the column heading concerned. Again, it's easiest to see how this works by carrying out an example:

18. Click on cell *D1* and **[Copy]** the column heading
19. Click on cell *H1* and press **<Enter>** (for **[Paste]**) to duplicate the heading
20. Click in cell *H3* and type `>7.5` - press **<Enter>**
21. From the **Data** menu choose **Filter** followed by **Advanced Filter...**
22. Amend the *Criteria Range:* to `A1:H3`
23. Press **<Enter>** or click on **[OK]** to carry out the filter

The result gives you rows where the diameter value is between 7.5 and 8 and the colour red-brown plus rows with the diameter more than 8 and the colour blue-green (as before).

Warning: It's very easy when using advanced filters to forget to redefine the criteria area.

24. Drag through cells *D3* to *H3* and press **<Delete>** to clear the red-brown criteria
25. From the **Data** menu choose **Filter** followed by **Advanced Filter...**
26. Press **<Enter>** or click on **[OK]** to carry out the filter

You will find you have ALL the data records displayed. This is because the filter is still set up to use row 3, which is now empty - ie include any records!

Using Multiple Sheets

With an advanced filter you can set up criteria on a different worksheet from the data, and show the results on the separate sheet if you want. Here, you need to create a new sheet before you can start:

1. Open the **Insert** menu and choose **Worksheet**
2. Click on the *PHOENIX* tab, drag through row numbers **1** and **2** and click on **[Copy]**
3. Click on the new *Sheet1* tab, make sure you are in cell *A1* and press **<Enter>** for **[Paste]**
4. Click on the *PHOENIX* tab, drag through row numbers **1** to **5**, from the **Edit** menu use **Delete**
5. Click on the *Sheet1* tab (*you must start the filter from the sheet where you want the results to appear*)
6. From the **Data** menu choose **Filter** followed by **Advanced Filter...**
7. To set the *List range*: click on the *PHOENIX* tab and type in `A1:G51` (ie *PHOENIX!A1:G51*)
8. Set the *Criteria range*: to `A1:G2`
9. Under *Action* turn on the **Copy to another location** option
10. Set *Copy to*: to `A5` and press **<Enter>** or click on **[OK]**

You will find the filter is carried out on *Sheet1*, with the original data still intact on *PHOENIX*.

Exercises

This exercise uses the file [advanced.xls](#) which is available on IT Services PCs in the **D:\training** folder.

Once the file is loaded, move to the *students* tab.

1. Filter the data to find out how many students have **Foot** as their tutor.
2. How many of tutor **Smith's** students live in **Private** accommodation?
3. How many students live in a Hall of Residence (ie not Private accommodation)?
4. How many students are called **Claire** or **Clare**?

5. Filter the data to show only the students who have one or more middle initials.
6. Filter the students to show just those whose surname begins with **S**.
7. How many students came in **2005** (as shown in their userid by 05)?
8. How many overseas students are female?
9. Filter the students to show the **12** oldest.
10. Using an advanced filter, filter the data to show both male students living in Bridges Hall and unmarried female students living in Wessex Hall.
11. List the overseas students who are taking option 2, 4, 6 or 8.
12. Filter the students to show all those with a birthday in **April**. (if you don't know how dates are stored and used in formulae, work through the notes on [*Dealing with Dates and Times in Excel*](#)).

Hint: you will need to create a new column of data using the **Month** function.

Try to amend this to show all those students with a birthday coming up later this month.

Hint 1: you will need to create another new column using the **Day** function.

Hint 2: a criteria such as **<30** can be entered directly into a cell; if it has to be calculated then use `= ">"&xxx` where xxx could be a cell reference or function, for example.

Close the file by clicking on the **[Close Window]** button - if you want to keep the results do so when asked.

[Answers to filtering exercises](#)