Calculating Elapsed Days | BY BILL JELEN

Dates in Excel live a dual existence. Although the program stores them as the integer number of days since January 1, 1900, Excel's number formatting forces it to display the values in a format such as MM/DD/YYYY. This dual existence leads to confusion—Excel will often perform the correct calculation but display the answer incorrectly. This article should clear up some of the date mysteries and introduce a few new functions.

Open a blank Excel workbook. Enter the value 39493 into cell A1, then select the cell. Use Format, Cells and choose any date format for the cell. You'll see that 39493 translates to February 15, 2008, on a Windows PC. (Macintosh computers store dates as the number of days since 1904, but that's a story for another day.)

Move to cell B1. Enter the current date using the Ctrl+; shortcut. This makes Excel enter the integer value for the current date into the cell and format it as a date.

Suppose you want to calculate the numbers of days elapsed from the first date to the second. In cell C1, enter the formula =B1-A1. Excel gives the confusing answer of a date early in 1900. Why? Excel calculated the correct answer but is showing it in the wrong format! Because both of the cells referenced in the formula were dates, Excel assumes that you want the answer formatted as a date. Select cell C1. Go to Format, Cells to change the cell to a number format with 0 decimals. Now it will show the correct answer.

Calculating Elapsed Months, Years, and More

Using the amazing DATEDIF function, you can have Excel compare two dates and express the difference in terms of months or years. I call the function amazing because it has been in Excel forever but has only been documented in the Excel 2000 help file. Every other version of Excel pretends it doesn't exist. To use the function, specify the earlier date, the later date, and an interval code. The valid interval codes are shown in cells C4:C9 of Figure 1. While the "d" interval code returns elapsed days just like the original formula in C1, the remaining interval options allow you to express the difference in months, months in excess of full years, etc. The formula in cell A11 uses three different DATEDIF functions to express the elapsed years, months, and days since the Sarbanes-Oxley Act became law:

```
="It has been "&DATEDIF(A4,B4,
   "y")&" years, "&DATEDIF(A4,B4,
   "ym")&" months, and "&DATED
   IF(A4,B4, "md")&" days since
   SOX went into law."
```

Calculating Workdays

What if you need to calculate the number of workdays between two dates? In this case, you'll want to use a function from the Analysis ToolPak called NETWORKDAYS. This function assumes you work Monday through Friday, but it's flexible enough to ignore company holidays. In Excel 2003 and earlier, the Analysis ToolPak needs to be enabled. On the menu, go to Tools, Add-Ins, and

Figure 2

Figure 2

Figure 1

make sure Analysis ToolPak is selected. In Excel 2007, all 89 ToolPak functions were incorporated as regular functions, so the add-in isn't required.

Cells A13:F21 of Figure 1 show the NETWORKDAYS function; B14:B21 contain the =TODAY() function to show the current date; and C14:C21 contain due dates for various projects. The company holidays are entered in F14:F21. The formula in D14 is =NETWORKDAYS (B14,C14,$F$14:$F$21).

A corollary function is the WORKDAY function. If you need to know the date that occurs 60 workdays after the current day, use =WORKDAY(TODAY(),60,F14:F21).

While NETWORKDAYS returns an integer number of days, WORKDAY is designed to return a date.

Defining Holidays as a Named Range

One disadvantage of WORKDAY and NETWORKDAYS is the need to have the company holidays entered on your worksheet. Even if you hide these in an out-of-the-way range, there's a chance someone could accidentally delete them. The following steps present an interesting way to hardcode those dates into a named range:

1. Enter your company holidays in F14:F21.
2. In an empty cell, type =F14:F21
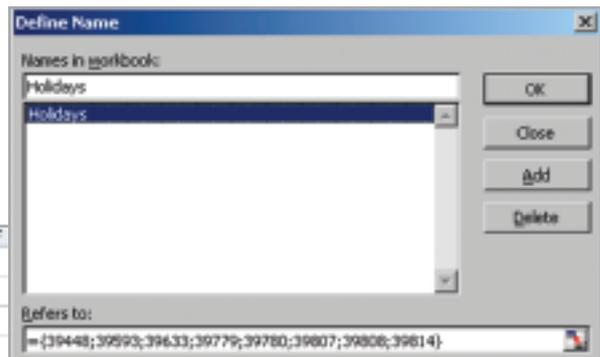
and press the F9 key. Excel will convert the typed-in range to the numerical values and then automatically highlight the text: {39448;39593;39633;39779;39780; 39807;39808;39814}.
3. Press Ctrl+C to copy the highlighted text to the clipboard.
4. Press ESC to exit formula entry mode.
5. In Excel 2003, use Insert, Name, Define. In Excel 2007, use Formulas, Define Name.
6. In the dialog box that appears, enter "Holidays" in the "Names in workbook" field. In the "Refers to" field, type an equals (=) sign and then press Ctrl+V to paste the date array, as shown in Figure 2. Select OK.

You can now use =NETWORK DAYS(A1,A2,Holidays) to calculate workdays.

Once you realize you can reformat a date calculation answer as a number or a date, you'll find there are a wide variety of functions for calculating elapsed time and presenting it in a number of formats. ■

Bill Jelen is the host of MrExcel.com. Send questions for future articles to IMA@MrExcel.com.