Birds and birdies

Stephen Wells on totting-up for twitchers and a whole-in-one solution for golfers.

John Norton, in Hampshire, is doing some ornithological research, analysing the feeding distribution of waders on intertidal mudflats. But you don't have to be a twitcher to make use of the solution to his spreadsheet problem.

It's best explained by looking at the hypothetical Excel example in Fig 1. In column A are listed seven birds. Row 1 lists nine subsites of a 718-hectare area. These are fictional figures: in actuality there are a lot more birds and up to 20 subsites. In row 2 are the sizes of those subsites, again in hectares. In the range B3 to J9 are the counts of each type of bird in each area. In other words, an Oystercatcher has been counted 18 times in Subsite 1 but not at all in Subsite 2.

In K3 to K9 are the totals of the counts for each bird. Column L gives the overall density — that is, the total count in column K divided by 718, which is the total area. Column N gives what is known as the occupied density; K3/M3 etc. John's need is for formulas in

M3					= {=SUM(IF($B3:$J3>0,$B$2:$J$2,0))}							
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Subsite no.	1	2	3	4	5	6	7	8	9	Total	Overall density	Occupied area	Occupied density
2	Area (ha)	85	58	128	70	54	135	103	19	66	718ha			
3	Oystercatcher	18	0	71	117	36	19	32	20	198	511	0.71	660	0.77
4	Ringed Plover	13	9	0	0	2	0	0	13	0	37	0.05	216	0.17
5	Grey Plover	2	5	0	5	4	0	8	0	47	71	0.10	436	0.16
6	Dunlin	5	269	0	133	41	44	8	39	768	1307	1.82	590	2.22
7	Curlew	0	12	41	54	19	37	53	0	79	295	0.41	614	0.48
8	Redshank	0	18	73	40	17	0	0	12	21	181	0.25	395	0.46
9	Turnstone	19	2	0	6	0	0	0	16	21	64	0.09	298	0.21
10	All species	57	315	185	355	119	100	101	100	1134	2466	3.43		

▲ **Fig 1** A formula to calculate the total area occupied by a bird, which necessitates eliminating the subsites where the bird has not been seen

column M, the occupied area. This is defined as the total for all subsite areas where a bird has been counted. I suggested the following array formula:

```
{=SUM(IF($B3:$J3>0,$B$2:$J$2
,0))}
```

Excel puts in the curly brackets when you press Ctrl+Shift+Enter to specify that it is an array formula. This is entered in cell M3 then dragged down to M9.

What the formula says is total all the subsite areas in the range B2 to J2 excluding those subsites where the value in the range B3 to J3 is zero. So the Oystercatcher's total is 718 hectares less the 58 hectares in subsite 2 because there were zero counts

You don't have to be a twitcher to make use of this solution

in column C. That makes the total occupied area in M3 660 hectares. The Turnstone shows a low occupied area because of no counts in Subsites 3, 5, 6 and 7.

• *The file, bird.xls, is on this month's cover CD. You can open it in Excel 5 and above.*

■ **Golfing in the round**
Reader Peter Forty has cracked it and a book token is on its way: regular readers will recall that in last December's column I reported that John Proud had asked for a scheduling worksheet in Excel which would show how he and 11 friends could team up to play six rounds of golf over four days in Scotland.

It's not an elimination tournament. They just want to play with and against as many partners as possible. I received a number of submissions but wasn't happy with them. Peter has done the job with one formula and I'm grateful that he described the worksheet in a lucid, brief email message with no attachments.

◄ **Fig 2** Two sections of a worksheet which determines who should play whom, so each holidaying golfer enjoys the company of the widest variety of his friends

Questions & answers

Q When I go to save an Excel file, how can I save time by having my preferred directory offered?

a *On the Tools menu, choose Options and the General tab. In the 'Default file location box,' enter your preference. For instance it might be: C:\Windows\Temp or C:\Lavender Hill.*

Q Is it true that having fewer worksheets in an Excel workbook reduces the file size? And can I reduce the default number opened?

a *Yes it is; and yes, you can. Go the same route as above but then turn the spinner in the 'Sheets in new workbook' box. I keep this set at 1 as it's easy enough to right-click on that first sheet's tab and open more sheets when I need them.*

Q Prior to opening a Word 97 document, I can preview it in the File, Open dialogue box, but Excel 97 always states 'Preview not available'. How can I make it available?

a *This is one of the most obscure options available in Excel. There is no mention of it that I can find in the Help files and you can't make a preview available via Tools, Options. What you have to do is open the Excel file, go to File, Properties, Summary, check the Save preview picture box, and then Save the file. The next time you select this file in the Open dialogue box, a preview picture will appear. Be warned, though: this feature can double the size of your file. A 16Kb workbook file will become a 38Kb file!*

Q Is there no way to change the defaults for the Excel Header and Footer options in Page Setup to something else? I find it very irritating that I have to set these for each and every workbook instead of being able to set them as a format available to all workbooks.
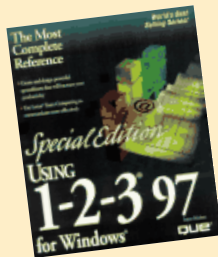
a *If you create a template named Book.xlt or Sheet.xlt and save it in the XLStart folder, Microsoft Excel uses the template to create new default workbooks or to insert new worksheets when you click Worksheet on the Insert menu. Save your preferred settings in the template. Any new workbooks you base on the template can include text you want to repeat in page headers and footers, or row and column labels. It will also control the number and type of sheets in a workbook; the cell and sheet formats you set by using the commands on the Format menu; cell styles; page formats and print area settings for each sheet. Also data, formulas, graphics, custom toolbars, macros, protected and hidden areas of the workbook, workbook calculation options and the window display options you set with the Options command (Tools menu).*
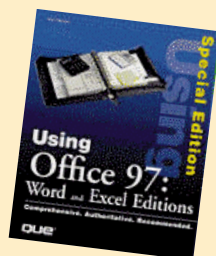
BOOK ROUND-UP

One of the most frequent requests I receive among my email messages is: 'What are the best current books on Lotus 1-2-3, Excel, and VBA for Excel?' The answer depends so much on how much experience the user has had.

• Lotus, unlike Microsoft, still believes in traditional, printed manuals and the volume, *Exploring SmartSuite* which comes with SmartSuite97 (the office suite which includes Lotus 1-2-3 97) is an excellent basic book.
• Beyond that, my preference is for *Special Edition Using 1-2-3 97*, published by QUE.
• Experienced Excel users will appreciate the sister volume, *Special Edition Using Word and Excel 97 in Office 97*.
• Excel beginners will like the clarity of *Excel Made Simple* by Stephen Morris and published by Butterworth-Heinemann.
• An excellent book on VBA for Excel is *Microsoft Excel 97 Developer's Handbook* published by Microsoft Press.

the range A1:A12. You name that range 'Players'. There are six rounds, so in A15:A20 you enter 1, 2, 3, 4, 5 and 6. Name that range 'Round'.

Similarly, in the range B14:M14 enter 1, 2, 3 and so on up to 12 and name that range 'Column'. And that's it, except to obviate instructions for use I have added some formatting. The entered values in A15:A20 are used by the formula but the custom format is "Round" 0 (i.e. the word Round in quotes, a space, and a zero). This adds the word 'Round' to the display.

All cells like B15 have the custom format @" and" (at sign, quote, space, and, quote). This adds the word 'and' to the display. Similarly, cell C15 and those like it have the custom format @" play". The colour backgrounds are only there to differentiate between the rounds in the illustration for the magazine.
• *The file, golf.xls, is on this month's cover-mounted CD. You can open it in Excel 5 or above.*

You select the range B15:M20 on a new worksheet [Fig 2] and type in the formula:

```
=INDEX(Players,MOD(MMULT(Round,
Column),13))
```

and then, instead of Enter, press Shift+Ctrl+Enter. Excel will add curly brackets at each end to indicate that this is an array formula (which follows the same action for multiple cells).

John had provided the names of the actual players and those are entered in

PCW CONTACTS

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