# University of Glasgow Dip / MSc Information Technology Information Systems and Databases

## **Tutorial Week 1 - Spreadsheet Programs**

### Answers

Richard Cooper

October 1st 2009

### General

1. What makes a spreadsheet so useful for managing accounts?

The rectangular layout matches an account book.

The formatting helps produce a good presentation.

The summary functions help with totals etc – and indeed many complex financial functions.

Immediate re-calculation helps you debug it.

You can view the way in which the numbers are derived.

2. When looking at a cell which four kinds of content might you find?

Text for labelling or for textual data – note text is distinguished from numbers by the fact the Format:Cells...:Number Tab has no effect.

Numbers.

A formula – for calculating a new value from existing values.

Nothing - whitespace is important for a readable layout.

### 3. How is formatting used to distinguish different kinds of number?

- There is only one stored representation of numbers in a spreadsheet c.f. int, float and double in Java. The only way the same number can be distinguished as an integer or real number is by use of formatting, which can also distinguish percentages, currencies, dates and times.
- 4. Which of the following are not numbers?:

1.3	ABC	£23.43	53.7%	=43+A2	23/1/98
	11:43:21				

ABC is text. =43+A2 is a formula. The rest are numbers.

The others could be formatted as text

5. List some of the formatting functions which can make a spreadsheet easier to read.

Column and row size. Font, font size, style. Borders. Colour of text and background. etc.

6. If G5 holds "=24\*H7+H8" and H7 holds "=60\*I9+J9", what would go wrong if you tried to enter "=100+G5+G6" into I9?

This would create a circular reference G5 – H7 - I9.

# Formulae

7. If the formula =23+B%6 - \$C7 was found in Cell D6, what would happen if it was moved to each of:

=23+D\$6 - \$C7		=23+B\$6 - \$C10		=23+A\$6 - \$C24.
<b>F6</b>		D9		C23
F6	D9	C23	A23	

A23 causes an error since it tries to make the formula = 23+ColumnX\$6 - \$C24, where column X is two cells to the left of column A, but column A is on the extreme left hand edge.

# The spreadsheet will say something like #REF! in the cell and =23+#REF! - C24 in the formula bar.

8. Given the following Spreadsheet:

	Α	В	С	D	Е	F	G
1	Annual Account 1997						
2	Income			Outgoing		Balance	
3	No. of Items Sold	Unit Price	Income	Staff	240000		
4	10000	53.5	535000	Materials	50000		
5				Utilities	100000		
6			535000		390000	Balance	145000
						=	
7	Year	Income	Outgoing	Balance			
8	1997	535000	390000	145000			
9	1998						
10	1999						
11	2000						

(a) Discuss the formatting facilities available in a spreadsheet program of your choice and how the look of this particular Spreadsheet could be improved by the use of formatting.

Almost anything would help, but most important are:

format numbers as currency

- embolden the headings probably make A1 a bigger font too
- use lines to separate sections and above totals
- possible use of borders and background colour.

set appropriate column widths

(b) What are the formulae in cells C4, E6 and G6?

C4 = A4\*B4 E6 = sum(E3..E5) G6 = C6 - E6

(c) The cells D3 to E5 represent a set of named areas of expenditure. What problems might occur in extending this list by adding extra areas of expenditure into the spreadsheet.

#### The other columns get out of alignment.

The sum might not be updated appropriately if inserted at the end – i.e. inserting a new row 6 will not update the sum. Probably the best fix for this is have a blank cell under the last cell and make the sum include this – then you can insert above the blank cell and the sum will change appropriately.

(d) The Sales Manager wants the spreadsheet extended with projected figures for the next few years. She tells you that she thinks that sales will go up by 2% per annum, the unit price will go up by 3% per annum and the costs of all the outgoing items will go up by 4%. Give formulae for columns B, C and D from row 9 downwards which produce the projected figures, outlining the process by which you entered formulae into cells.

Tutorial 1

IT Information Systems and Databases Spreadsheets

The key word in the description is "thins" – this means that these values might changes and so they must not be plugged directly into any formulae. Instead they should be placed in cells and referred to as constants bu use of dollar signs. You should also put a description on an adjacent cell so anyone else can figure out what the numbers means.

Note also that the numbers go is as 0.02, 0.03 and 0.04 not 2, 3 4. If you did the latter you would have to complicate the formulae by dividing by 100.

F8 = "Sales Increase"	G8 = 0.02 formatted as percent	
F9 = "Price Increase"	G9 = 0.03 formatted as percent	
F10 = "Cost Increase"	G10 = 0.04 formatted as percent	
B8 = "=C6"	C8 = ''=E6''	D8 = "=G6" or "=C8-B8"
<b>B9</b> = ''= <b>B8</b> *(1+\$G\$8)*(1+\$G\$9)	C9 = ''=C8*(1+\$G\$10)	D9 = "=C9-B9"
B10 etc. copied down.		

## Additional Question Not Handed Out

9. A spreadsheet contains details of the specific items sold with columns for the item type, the price, the number sold and the sale total. Create this in columns A to D. Then in columns F to H put the item type, the total number sold of that item type and the total sales of that item type. Finally in column I assign a sales band to each item type, so that those items bringing in less than £1000 are banded 'A', ones up to £2000 are banded B, ones up to £5000 are banded C, and so on.

	Α	B	С	D	E	F	G	H	Ι
1	item type	price	number	total		item type	tot number	total sale	band
2	hats	<b>£20</b>	1	<b>£20</b>		hats	277	£3333	С
3	shoes	£30	1	£30		shoes	111	£999	Α
4	shirts	£10	3	£30		shirts	222	£1567	B
5	hats	£30	2	£60					
999	shirts	£20	1	£20					

D2 = B2 \* C2, and copy down

G2 = sumif( \$A\$2:\$A\$999, \$F2, \$C\$2:\$C\$999 ) and copy down

H2 = sumif( \$A\$2:\$A\$999, \$F2, \$D\$2:\$D\$999 ) and copy down

Note if we drop the \$'s before the C's in G2 this will copy across.

### Column I calculation requires a lookup table:

	K	L	Μ
1	max sales	band	description
2	1000	Α	small sales
3	2000	B	mediocre sales
4	5000	С	significant sales
5	10000	D	large sales

#### I2 = vlookup(H2, \$K\$2:\$L\$5, 2) turning the 2 into a 3 puts the description into column I.

IT Information Systems and Databases Spreadsheets

Tutorial 1