

Spreadsheet Software

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4 Absolute and Relative Addressing

Previously, we merged cells, used autofill, added up rows of numbers, used copy and paste and paste special, inserted a currency symbol and saw how to multiply. Now, we look at:

- using absolute formula references
- using relative formula references

Our friend, Terry Bull, receives just £30 per week. We see how he manages his money month by month.

4.1 Relative Addressing

This is the formula view of the spreadsheet.

	A	B	C	D	E
1	Terry Bull's Cash Flow (illustrating relative addressing)				
2					
3		Jan	Feb	Mar	
4	Income	120	120	120	
5					
6	Expenditure				
7	food	60	55	65	
8	travel	20	22	18	
9	internet	35	35	35	
10					
11	Total	=SUM(B7:B9)	=SUM(C7:C9)	=SUM(D7:D9)	
12	Savings	=B4-B11	=C4-C11	=D4-D11	
13					

Looking at B11 we see that the expenditure for Jan has been added up. The formula is then copied to C9 and D9 using autofill in the usual way. We notice that the cell ranges, C7:C9 and D4:D11 are automatically inserted when the formula is copied.

Again, look at B12. The formula is B4-B11, to get the savings for the month. When the formula is copied using autofill into C12 and D12, the cell references, C4 and C11, D4 and D11, are automatically inserted. Saves us having to think! But, there is another way.

4.2 Absolute Addressing

Again we show the formula view of the spreadsheet. This time there is just one entry for the monthly income.

	A	B	C	D	E
1	Terry Bull's Cash Flow (illustrating absolute addressing)				
2					
3	Monthly Income	120			
4					
5	Expenditure	Jan	Feb	Mar	
6	food	60	55	65	
7	travel	20	22	18	
8	internet	35	35	35	
9					
10	Total	=SUM(B6:B8)	=SUM(C6:C8)	=SUM(D6:D8)	relative addressing
11	Savings	=B\$3-B10	=B\$3-C10	=B\$3-D10	absolute addressing
12					
13					

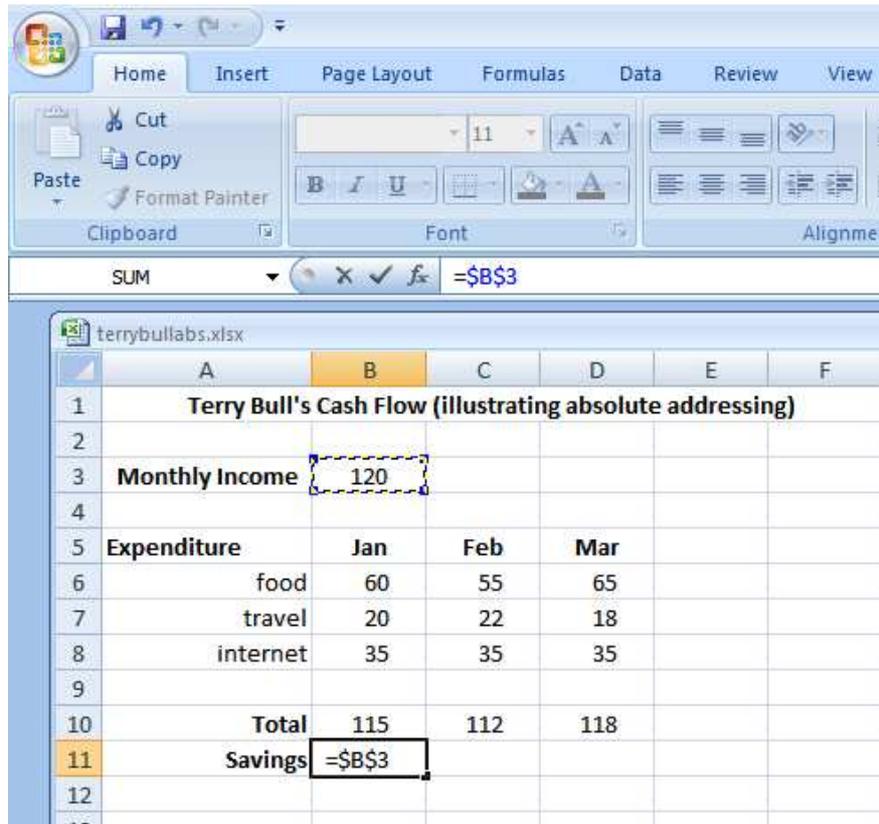
The total expenditures for Jan, Feb and Mar are arrived at in the usual way. But the savings is different. In B11 we see \$B\$3. This refers to cell B3. But the cell is anchored so that when we copy the formula using autofill into C11 and D11, the reference to B3 remains unchanged; it is fixed, superglued to the spot. This is an example of *absolute addressing*.

We see how its done.

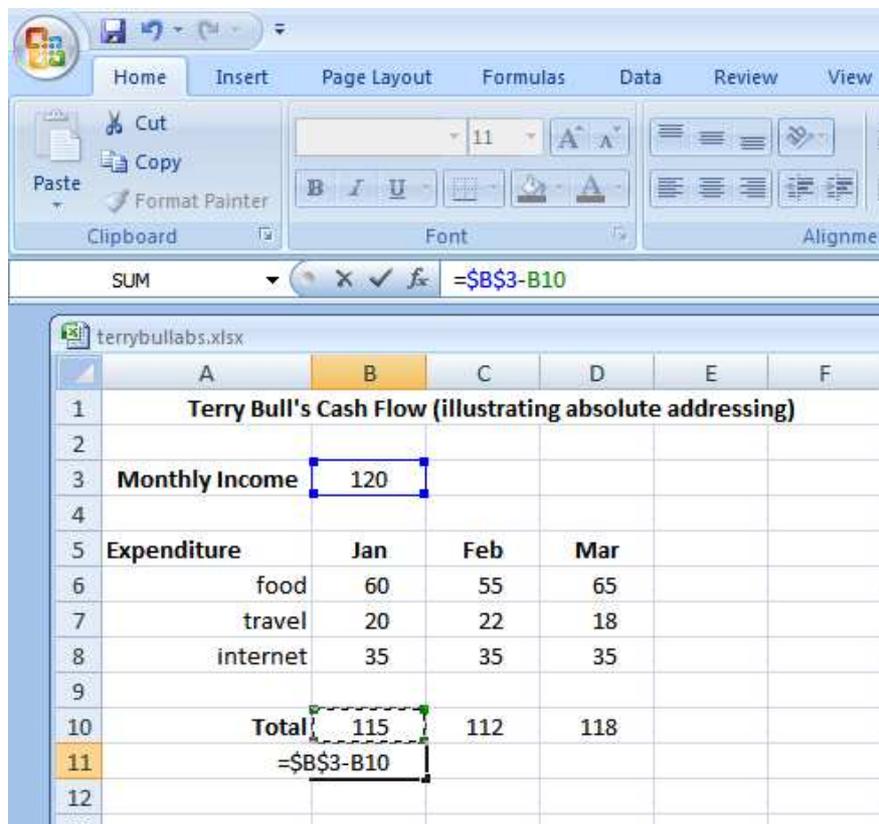
1. make B11 active
2. in the formula bar enter =
3. click on B3

	A	B	C	D	E	F
1	Terry Bull's Cash Flow (illustrating absolute addressing)					
2						
3	Monthly Income	120				
4						
5	Expenditure	Jan	Feb	Mar		
6	food	60	55	65		
7	travel	20	22	18		
8	internet	35	35	35		
9						
10	Total	115	112	118		
11	Savings	=B3				
12						
13						

4. press the F4 key. B3 becomes \$B\$3



5. enter a minus sign, -, and click on B10



6. press Return to complete

7. now take hold of the bottom right hand corner of B11 and drag to D11

	A	B	C	D	E	F
1	Terry Bull's Cash Flow (illustrating absolute addressing)					
2						
3	Monthly Income	120				
4						
5	Expenditure	Jan	Feb	Mar		
6	food	60	55	65		
7	travel	20	22	18		
8	internet	35	35	35		
9						
10	Total	115	112	118		
11	Savings	5	8	2		
12						
13						

8. check that the answers are correct

There are three absolute styles and one relative.

style	meaning
\$A\$1	both column A and row 1 are anchored
\$A1	column A is anchored, row 1 is not
A\$1	row 1 is anchored, column A is not
A1	neither the column nor the row is anchored

Repeatedly pressing the F4 key on a cell reference in the formula bar cycles through the four styles. For example, type B3 in the formula bar. Press F4 and you see \$B\$3. Press F4 again and you see \$B3. Press F4 again and you see B\$3. Press F4 again and you see B3.

4.3 Exercises

1. Your kid brother needs a multiplication table. Create one like that shown below. The user enters any table they would like to see. For example, the user enters 2. The answers to the 2-times table is shown up to 5 x 2. The formula in C5 should have an absolute reference to cell C3 before being copied down to C9. Check that your answers are correct. Then extend the table so that it shows the answers down to 25 x whatever-number-was-entered-by-the-user.

	A	B	C	D
1	Displays a multiplication table			
2				
3	Which table?		2	
4				
5		1	2	
6		2	4	
7		3	6	
8		4	8	
9		5	10	
10				
11				
12				

2. Priti Manek runs a business buying and selling clothes. Create a spreadsheet for her similar to the one shown below.

	A	B	C	D	E	F	G
1	Mark Up		Item	Cost Price	Profit	Selling Price	
2	10%		bomber jacket	100	10	110	
3			leather boots	120	12	132	
4			silk scarf	20	2	22	
5			leather trousers	80	8	88	
6			crash hat	250	25	275	
7							
8							

She chooses her mark up. The profit on her cost price is then calculated from her mark up. The selling price is then calculated from her cost price and profit. Include appropriate descriptive comments. Any cell reference to her mark up percentage must be absolute, so that whenever she changes her mark up percentage, the new profit and selling prices change automatically. You might need to discover how to format a number as a percentage. Remember to include your name and the date in the footnote.

3. The cumulative sum (or running total) is used a lot in statistics.

	A	B		
1	Number	Running Total	because	formulae
2	1	1	1	Sum(A\$2:A2)
3	3	4	1 + 3 = 4	Sum(A\$2:A3)
4	5	9	1 + 3 + 5 = 9	Sum(A\$2:A4)
5	7	16	1 + 3 + 5 + 7 = 16	Sum(A\$2:A5)
6	9	25	1 + 3 + 5 + 7 + 9 = 25	Sum(A\$2:A6)

Write and test a spreadsheet that will display the cumulative sum of a column of five numbers. Check your answers. Then extend your spreadsheet to display the cumulative sum of 25 numbers.

4. You kid brother is not happy. He does not like the spreadsheet you produced for question 1 above. He wants a table chart, from 1 x 1 up to 25 x 25. Ok. You want to produce one with the minimum of effort.

We start by producing a small table. We write 1..5 along the columns, and 1..5 along the rows. For each cell we write *column x row*.

	A	B	C	D	E	F
1		1	2	3	4	5
2	1	1 x 1	2 x 1	3 x 1	4 x 1	5 x 1
3	2	1 x 2	2 x 2	3 x 2	4 x 2	5 x 2
4	3	1 x 3	2 x 3	3 x 3	4 x 3	5 x 3
5	4	1 x 4	2 x 4	3 x 4	4 x 4	5 x 4
6	5	1 x 5	2 x 5	3 x 5	4 x 5	5 x 5

Look at E4 (emboldened). Its value is 4 x 3.

The 4 comes from E1. The 1 is fixed. So we write E\$1.

The 3 comes from A4. The A is fixed. So we write \$A4

So our emboldened cell, E4, is E\$1 x \$A4.

Therefore the formula in cell B2 is B\$1 x \$A2

You will want to insert 1, 2, 3, 4, 5 in row 1. Enter 1 in B1. Enter 2 in C1. Highlight both B1 and C1. Take hold of the bottom right hand corner of C1 and drag to F1. Use the same method to fill A2..A6 with numbers 1..5.

Complete the spreadsheet to create a table chart up to 5 x 5. Check that your answers are correct. Then extend the table up to 25 x 25. Remember to include appropriate comments. Remember to put your name and the date in the footer. Give your completed spreadsheet to your kid brother.

We have seen how to:

- use relative addressing
- use absolute addressing

Next we look at charts.

Bibliography

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