

Home exercise

Exercise 1

In Excel VBA write a user defined function (UDF) that sums up all even numbers from the range below.

	A	B	C	D
1	83	80	80	39
2	9	60	66	24
3	92	85	28	87
4	29	65	92	86
5	95	45	61	4

Exercise 2

Using the example from Exercise 1, write a sub routine that returns a unique list of values in ascending order. Return the results in a new range in Excel.

Exercise 3

	A	B	C	D	E	F	G	H	I	J	K	L	M
1													Sum
2		8	5	9	6	0	3	7	8	2	40		88
3													
4		3	5	11	9	6	4	5	1	8	34		174
5													
6		8											
7		5											
8		9											
9		6											
10		0											
11		3											
12		7											
13		8											
14		2											
15		40											
16		3											
17		5											
18		11											
19		9											
20		6											
21		4											
22		5											
23		1											
24		8											
25		34											

Using the above example, write a macro that:

1. Creates an empty array that holds exactly 10 values (integer).
2. Upload the values in the white range (B2:K2) into the array.
3. Sums up the values in the array and displays the result in the green cell (M2).

Extend the macro to:

1. Re-dimension the original array to hold 10 more values (integer) and preserve the existing 10 values.
2. Upload the values in the blue range (B4:K4) into the array after the existing values.
3. Sum up all the values in the array and display the result in the yellow sum cell (M4).
4. Finally return the results of the array in the yellow range (B6:B25).

Exercise 4

In Excel VBA write a UDF to calculate factorial using **recursive algorithm**.

$n! = n * (n - 1) * (n - 2) \cdot \cdot \cdot 3 * 2 * 1$

Exercise 5

The following exercise needs to be performed on the surface of the sheet (i.e. no VBA code).

1. Using the blotter entries below (pink area) generate Table A to display total position by Currency and by Contract.
2. Using the same blotter entries generate Table B to show average price by currency.

	A	B	C	D	E	F	G	H	I	J	K
1		Blotter									
2		Currency	Contract	Position	Unit Price		Table A				
3		USD	Jun	5	99.5			Sum of Position			
4		USD	Sep	12	99.45			Mar	Jun	Sep	Dec
5		USD	Dec	5	99.51			USD	45	14	111
6		GBP	Sep	10	97.2			GBP	0	0	10
7		USD	Sep	99	99.38			EUR	0	400	0
8		USD	Dec	23	99.38						
9		USD	Dec	99	99.41						
10		EUR	Jun	400	99.83						
11		USD	Mar	45	99.55						
12		EUR	Dec	200	99.81						
13		USD	Jun	9	99.53		Table B				
14		GBP	Dec	5	97.4			Average Price			
15								USD	99.43		
16								GBP	97.27		
17								EUR	99.82		

Exercise 6

The following information is received in two separate csv files (internal.csv and external.csv)

internal.csv

```
ID,Quantity,Price,B/S,Instrument,Expiry,Trader
TR1,225,99.95,B,Z,Jun-16,John
TR2,142,99.85,B,X,Sep-16,Paul
TR3,240,98.75,S,X,Sep-16,John
TR4,150,99.25,B,Z,Dec-16,David
TR5,95,99.55,S,Y,Mar-17,Ron
TR6,100,99.95,S,Z,Dec-16,Paul
TR7,25,99,S,Z,Dec-16,John
```

external.csv

Instrument,Expiry,Risk
X,Sep-16,-9514.20
Y,Mar-17,-9457.25
Z,Jun-16,22488.75
Z,Dec-16,2417.50

Your task is to compare the files and find if there are any risk breaks* between the two files and report them accordingly.

* There is no risk break if the internal risk has the same magnitude, and sign, of the external risk (aggregated by Instrument and Expiry level).

1. In Excel VBA write code that imports data from these csv file in two separate ranges in Excel workbook (use ADODB.Recordset)
2. Enhance the code to perform data enrichment before Risk comparison.

Note: Risk is already available in external.csv, but it needs to be derived in internal.csv

Risk = Quantity * Price * Direction

- If 'B/S' column = B then Direction = 1
 - If 'B/S' column = S then Direction = -1
3. Report any risk breaks between the two files on Instrument and Expiry level.
 4. Which Trader(s) do you need to contact to verify their record entries?
 5. Provided records in internal.csv are confirmed correct, which record do you need to ask the external.csv file provider to verify.

Exercise 7

Describe basic Excel object model. Design code that iterates through all used ranges in all worksheets in all open workbooks in Excel session and identifies those containing formula and array formula. Write the results in c:\Temp\results.xml (use the output style in the example below).

```
1  <Workbooks>
2  <Workbook Name="Wbk1">
3      <Worksheet Name="Sheet1">
4          <Range Address="A1">
5              <Formula>=someFormula</Formula>
6              <HasArray>FALSE</HasArray>
7          </Range>
8      </Worksheet>
9  </Workbook>
10 <Workbook Name="Wbk1">
11     <Worksheet Name="Sheet1">
12         <Range Address="B2:B5">
13             <Formula>=someArrayFormula</Formula>
14             <HasArray>TRUE</HasArray>
15         </Range>
16     </Worksheet>
17 </Workbook>
18 </Workbooks>
```

Exercise 8

Using the information below create a data structure using class modules in VBA. Extend the code to perform simple and compounded return calculation over 5Y investment horizon. Use annual compounding frequency. Generate final statement for each investor after each year in a new Excel file. Factor in capital gain tax (CGT) at 20% with CGT tax allowance of £11,100 per year.* Any unused CGT allowance cannot be carried forward. The CGT is payable on the profit when you sell (dispose of) asset. There is no CGT payable on GILTS. Write a macro to generate an email with Excel attachment (see **Example 2**) for each investor (make up email addresses).

(*this is an abstract case – please see **Example 1** at the end of this exercise regarding profit & loss (p&l) and CGT calculations)

Other assumptions:

- There are no other costs to consider (transaction, stamp duty, fees, dividend tax etc).
- Tax year = calendar year.
- Investors keep all investments from initial opening in year 1 to the end of year 5 and all returns are reinvested within the asset class they have been generated in.
- Investors sell the entire investment at the end of year 5.

Investor details and initial asset allocation

Name	John S	David M	Paul A
Opening Balance	2,500,000	3,050,000	1,200,000
- invested as below			
Cash	30.00%	5.00%	0.00%
Equites	30.00%	45.00%	70.00%
Gilts	40.00%	50.00%	30.00%

Asset return

Asset return	Cash	Equities	Gilts
Return year 1	0.35%	3.80%	0.50%
Return year 2	0.30%	4.00%	0.45%
Return year 3	0.30%	2.00%	0.40%
Return year 4	0.40%	-1.20%	0.55%
Return year 5	0.55%	1.50%	0.60%

Example 1: P&L and Capital Gain Tax (CGT) calculation

Assumption – all investments are disposed of at the end of year 1.

Opening Balance	3,050,000	Invested in	Return Year 1	P&L Year 1	CGT
Cash	5%	152,500	0.35%	533.75	20%
Equities	45%	1,372,500	3.80%	52,155.00	20%
Gilts	50%	1,525,000	0.50%	7,625.00	0%

			Comments
1	P&L from Cash and Equities	52,688.75	sum of p&l for cash and eq
2	CGT Annual Allowance	11,100.00	
3	Realised P&L from Cash and Eq. (subject to CGT)	41,588.75	calculated as 1-2
4	CGT rate (20%)	8,317.75	calculated as 3 * 20%
5	P&L from Cash and Eq. after CGT	44,371.00	calculated as 1-4
6	P&L from Gilts	7,625.00	p&l from gilts
7	Total P&L after CGT	51,996.00	calculated as 5+6
8	Closing Balance	3,101,996.00	calculated as Opening Balance + 7

Example 2: Attachment



Excercise7_Attachm
ent.xlsx

Note:

Acceptable version to use:

MS Office 2010

Excel version 14

VBA 7.0

or lower