

Lab-session 4

- 1) A geologist wants to grade some ore samples found on four different sites based on their rare metal content. Ore with a rare metal content of 50-59 ppm is given a low grade, 60-79 ppm is medium grade, 80-99 ppm is high grade and anything greater or equal 100 ppm is very high grade. Design a worksheet using the HLOOKUP function which performs this task. It should look roughly like this: Improve the table by including an IF-function in

	A	B	C	D	E
1		Quality			
2	ppm	50	60	80	100
3	grade	low	medium	high	very high
4					
5	site	ppm	grade		
6	A	55	low		
7	D	111	very high		
8	C	60	medium		
9	B	77	medium		
10	A	44	#N/A		
11	B	88	high		
12	C	99	high		
13	C	56	low		
14	D	102	very high		

such a way that instead of the error message “#N/A” a blank will be displayed. Hint: You can do this easily by expressing the condition insides the IF-function in terms of the function TYPE seen in Lecture 4.

- 2) From the course website¹ download the Excel file which contains the data of the periodic table for the 109 elements, that is their symbols, names, numbers and atomic weights. Design a worksheet using a VLOOKUP-function which performs the following task: When you enter just the symbol of an element in one cell it finds for you the corresponding atomic number, name and atomic weight. For instance when you enter just “Ar” into the worksheet it should produce

Symbol	Number	Name	Atomic Weight
Ar	18	Argon	39,948

- 3) Consider once more the periodic table from question 2). Modify your answer to question 2) by adding to it a molecular weight calculator. Implement the calculator by using some VLOOKUP-functions. The table should work in such a way that the formula for a molecule is just entered by the symbols of the atoms and the number of times the atom occurs in the molecule. Pick up the atomic weights from the table and sum up all weights. For instance the formula for Methane is CH_4 with molecular weight

$$12.011 + 4 * 1.00794 = 16.06.$$

¹<http://www.staff.city.ac.uk/o.castro-alvaredo/PROGRAMMING1/programming1.html>

Test your table for water $H_2O \rightarrow 18.02$, salt $NaCl \rightarrow 58.44$, sugar $C_{12}H_{22}O_{11} \rightarrow 342.30$, carbon dioxide $CO_2 \rightarrow 56.02$, ethyl alcohol $C_2H_6O \rightarrow 46.07$ and cinnabar $HgS \rightarrow 232.66$. As an example, for sugar your table should produce

Formula			
symbol:	C	H	O
times:	12	22	11
partial mass:	144,132	22,17468	175,9934
molecular weight:	342,3		

4) Use a combination of nested IF functions and the ADDRESS function seen in the class to produce a function such that

- when the value of cell A1 is 1 returns an absolute reference for cell A1,
- when the value of cell A1 is 2 it returns a mixed reference, with fixed column for cell A1,
- when the value of cell A1 is 3 it returns a mixed reference, with fixed row for cell A1,
- when the value of cell A1 is 4, it returns a relative reference for cell A1,
- when the value of cell A1 is not 1,2,3 or 4 then it returns the message "please choose a value in the set 1,2,3,4".

All the references should be returned in the standard style (also known as A1-style).