Home Exercises 2

The second home exercises have to be submitted to email Petr.Jakubik@eiopa.europa.eu or petrjakubik@seznam.cz till May 29, 2020 at the latest. It can be a team work, group can contain up to three members. The filename needs to have the following structure:
HW2_Surname1_Surename2_Surename3.xls
The first sheet of the excel file (cover sheet) has to contain the full names of the group members; each exercise needs to be placed on the separate sheet, an email subject should be "VBA – HW2".

1. Write a Public function named "StudyDuration", which calculates the length of user's university study and displays it in a message box. The function should have four parameters named "start" for a starting date of university study, "graduation" for a graduation date of university study, "expected" for an expected date of graduation and "format" determining the way of presenting the result. In case that user's study was not completed yet, the parameter for graduation date will remain empty and today date will be automatically taken into account for the calculation. Furthermore, in case that the parameter "expected" will be non-empty, the function should provide the length of user's university study as well as the length of the expected length of the whole user's university study till his/her graduation. The value of the "format" parameter should be "ymd" for presenting the results in years, months and days (e.g. 5 years, 2 months and 2 days), "y" for presenting the results in years (e.g. 5.17 years), "m" for presenting the results in months (e.g. 62.07 months) and "d" for presenting the results in days (e.g. 1862 days). The user should input his/her starting and graduation date in the university into cells in the worksheet. In case that his/her study was not completed yet, the cell for graduation date will remain empty. Apart from this, the user could indicate the expected date of completion of his/her studies in a cell on the worksheet. The worksheet should contains a button "StudyDuration" calling the function taking the value of the parameters from the spreadsheet. An option buttons should be placed on the worksheet providing values of the parameter "format". Additionally, a button example should be placed on the worksheet providing some example of the correct values filled in the required fields. The program should work correctly every day and for all possible inputs. You should control, whether all items are correctly inputted (e.g. the expected graduation should not be filled when the graduation is filled).

2. Write a Public Function named "FunctionValues", which takes values of vector x from the specified cells (array) and calculate the function $f(x) = x^3 + 1/2x + 5$ for all values (array). The function should have one parameter (type array) and will return one array with the same dimension as parameter. Provide some example of using such a function in the worksheet.

3. Write a Public Function named "Reverse" that returns an array with four items (the output will be a row vector with four items) – (1) reverse string so that the last letter will be the first (for instance "school" => "loohcs"), (2) the length of the string, (3) the number of numeric charters and (4) the number of special characters (non-alphabetic and non-numeric). The user can decide whether the first letter of the reverse string will be capital or not. The function should take two arguments: (1) a string to be converted and (2) a (Boolean) parameter that indicates whether the first letter should be capital (true) or not (false). All other letter should not be capital. Provide some examples of using such a function in the worksheet.

4. Write a Public Function named "MyOLS" that takes two ranges as inputs and performs an OLS regression where the dependent variable's data is defined in the first range (row vector -

dimension – n x 1) and the independent variables' data is defined in the second range (matrix – dimension – n x m). The function should return the resulting parameter estimates, standard errors, t-values and P-value as one array (dimension – [m+1] x 4). Please note that you are not allowed to use Excel's built in regression function in this exercise. Moreover, the regression needs to consider constant (m independent variables plus one constant). However, the range of independent variables (parameter) does not include unit vector in the first column. Provide some examples of using such a function in the worksheet.

Hint: Please note that the function needs to work with m regressors (not only one)!!!