

Lab-session 8

Try to do this session under exam conditions. Answer 3 out of 4 questions within 90min. Do the remaining question as an exercise. The solution includes a marking scheme, which gives you a rough idea about value of certain parts of the questions. Notice that 75marks=100%.

- 1) a) Write down the two functions which are produced by the following combinations of Excel built-in functions:

i) =IF(NOT(AND(x>=0,x<>10,x<>15)), SIN(x),IF(x<=6,EXP(x),COS(x)))

ii) =IF(OR((NOT(x>=-11) ,x>=10)), 13*x,x^2)

Compute $f(0)$ and $f(15)$ in each case up to a precision of two decimal places.

- b) Write down the command line for an Excel built-in function which produces the function

$$f(x) = \begin{cases} (22 - x^2)/5 & \text{for } x \leq 2 \\ x^3 + 2x^2 - 1 & \text{for } x > 2 \end{cases} .$$

Implement your the function into a spreadsheet and complete the following table. Give your answer up to a precision of two digits.

x	-3.1	2	5.9	11.2
$f(x)$				

- 2) a) Write a user defined function called “MMAv”, which computes for an arbitrary amount of input variables the minimum MI , the maximum MA and the average AV of these variables. The function “MMAv” should return the value

$$\frac{MA + AV}{(MI - AV)^2}$$

when $MI - AV \neq 0$ and the error message “Division by zero!” otherwise.

- b) Use your function to complete the following table:

x	y	z	MMAv
4	6	11	
13	13	13	
-1	-4	5	

- 3) a) Consider the following table and complete the command lines, i.e. replace the *** with the appropriate data

	A	B	C	D	E	F
1	Country	UK	Germany	India	China	Brasil
2	Capital	London	Berlin	New Delhi	Beijing	Brasilia
3	Inhabitants	60.3 Mio	82.4 Mio	1065 Mio	1298 Mio	184 Mio
4	Area/km^2	244820	357021	3287590	9595960	8511965
5	Birth rate	10.88	8.45	22.8	12.98	17.25
6						

=HLOOKUP("India",A1:F5,***,FALSE) → New Delhi
 =HLOOKUP("Berlin",***,FALSE) → 82.4 Mio
 =HLOOKUP("Wales",***,2,***) → Brasilia
 =VLOOKUP(***,A1:F5,***,FALSE) → London

- b) Write a user defined function called "Country", with two input parameters. The first input parameter is the name of a country. For different choices of the second input parameter the function should return the capital, the number of inhabitants, the area or the birthrate depending on whether the it is "Capital", "Inhabitants", "Area" or "Birth rate". When the second parameter is "Inhabitants/Area" the function should compute the Inhabitants per km². Use an IF-structure and an HLOOKUP table to construct your function. When the wrong comand is used in the second input parameter produce the error message "Command not found!". Declare all variables!
- 4) The following function computes a greeting depending on the hour. Eliminate the IF-structure and replace it with a SELECT CASE structure.

```

Function hello(x)
  Dim y As Integer
  y = Hour(x)
  If y < 12 Then
    hello = "Good Morning!"
  ElseIf y < 18 Then
    hello = "Good Afternoon!"
  ElseIf y < 22 Then
    hello = "Good Evening!"
  Else
    hello = "Good Night!"
  End If
End Function

```