

Lab-session 5

- 1) For large values of n Stirling's approximation reads

$$\ln(n!) \approx n \ln(n) - n \quad \text{for } n \gg 1.$$

- a) Design a user defined function for the right hand side of this equation.
- b) Test the precision of this approximation by using the Excel built-in function FACT to compute the factorial. How good is the approximation for $n = 100$?

- 2) For small values of x you can approximate $\sin(x)$ by

$$\sin(x) \approx x - \frac{x^3}{6} \quad \text{for } x \ll 1.$$

- a) Design a user defined function for the right hand side of this equation.
- b) Test the precision of this approximation by using the Excel built-in function SIN. How good is the approximation for $x = 0.1$?

- 3) Write a user defined function which converts Fahrenheit to Celsius according to the formula

$$\text{Celsius} = \frac{5}{9}(\text{Fahrenheit} - 32).$$

Convert 90 degrees Fahrenheit into degrees Celsius.

- 4) Write a user defined function that taking two numbers as input returns the logical value TRUE or FALSE. The function should return TRUE if both numbers are greater than zero and FALSE otherwise. Employ for this the Excel Built-in function **AND** in the form **Application.Worksheetfunction.AND** (as seen in the lecture).
- 5) Write a user defined function which takes three separate strings of characters as input and returns one single string as output. Declare the variable type of the function and the arguments properly as strings. Test your function by writing into the cell A1 "City", into A2 "University" and into A3 "London". Your function should convert this into "City University London". (You can join two character strings in VBA by "ABCD" & "EFGH" \rightarrow "ABCDEFGH".)