

**Aim:** Understanding functions, lambda functions and recursion.

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**Note:** In this lab work, you will write a python script for questions 1 and 2. For questions 3 and 4 you will write in C++.

**1.** Please solve the below equation in python with using only lambda functions and lists. You should take “n” and “x” as parameters entered by user.

$$e^n = 1 + \frac{n}{1!} + \frac{n^2}{2!} + \frac{n^3}{3!} + \cdots + \frac{n^x}{x!}, \quad -\infty < n < \infty$$

**2.** Please solve the equation below in python with a recursive function and a global variable. Your function should take “n” as a parameter but returns nothing. Use docstring to explain your function.

$$\sum_{k=1}^n \frac{(-1)^{k+1}}{k}$$

**3.** Please solve the equation in question 2 in C++ using recursion. You should take “n” from the user, but this time you will return the answer.

**4.** Please overload your function from 3. This time it won't take any parameters. Instead, you will ask for “n” inside of the function.