

## Tutorial 4

### Loops (for, while, repeat)

#### Exercise 1:

1. Write the algorithm that asks for a starting number  $n$ , and displays the three following numbers.
2. Write the algorithm that asks for a number  $N$ , and calculates the sum of the integers up to this number.
3. Write the algorithm that asks for a number  $N$ , then calculates the  $N^{\text{th}}$  term  $U_N$  of the Fibonacci sequence given by the recurrence relation:  
$$U_0=0$$
$$U_1 = U_2 = 1$$
$$U_N=U_{N-1} + U_{N-2} \quad (\text{where } N>2).$$

#### Exercise 2:

- a. Write an algorithm that asks the user to enter a sequence of positive numbers, it computes their sum, when the user enters a negative number, the algorithm stops.
- b. Write the extension of this algorithm, with a limit of 10 consecutive numbers, if no negative number is entered.

#### Exercise 3:

- a. Write the algorithm that asks the user to guess a number. The user can make suggestions until he comes up with the right number.
- b. Write the extension, where the user is allowed to enter up to 5 attempts.
- c. Write the extension, where with each attempt, the program guides the user whether the suggested number is bigger or lower than the number to guess.