



Tutorial 3 : Loop Statement

Exercise 1 :

Provide the algorithm and the C program to display the square of all numbers less than N. N is a positive integer given by the user.

Exercise 2 :

Provide the algorithm that calculates and displays the sum of the squares of the even numbers less than N. N is a positive integer entered by the user.

Exercise 3 :

Provide the algorithm to estimate the value of PI (3.1416...) according to the following formula:

$$PI = 4 \left(1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \frac{1}{9} - \dots - \frac{1}{9999} \right)$$

Exercise 4 :

Provide the algorithm and the C program that ask the user to enter an integer greater than 10. The program should continue to ask for input until the user enters a correct number.

Exercise 5 :

Provide the algorithm that asks the user to enter a set of non-zero real numbers. The input will end if the sum of the numbers entered is greater than or equal to 5000 or if the product of the numbers entered is strictly greater than 100000. The program should display the sum and the product of the numbers entered.

Exercise 6 :

Provide the algorithm that asks the user to enter a positive integer N, then the program calculates and displays the first N terms of the Fibonacci sequence defined as follows:

$$\begin{cases} U_0 = 0 \\ U_1 = 1 \\ U_n = U_{n-1} + U_{n-2} \text{ pour } n \geq 2 \end{cases}$$

Exercise 7 :

Write an algorithm that asks the user to enter two positive integers N and r, and then determines the smallest integer k such that

$$\sum_{i=1}^k \frac{i}{i+r} \geq N$$