

TD Series N°03

Loops

Exercise 01

Recall that the factorial function is defined over positive integers as follows:

$$\begin{cases} 0! = 1 \\ n! = n \times (n-1) \times \dots \times 2 \times 1 \quad \text{si } n > 1 \end{cases}$$

Write a program to calculate the factorial of an integer n given by the user.

Exercise 02

Write a program that calculates the nth power of a number x, where n is a positive integer. n and x are given by the user.

$$x^n = \underbrace{x * x * \dots * x}_{n \text{ fois}}$$

Exercise 03

Write a program to complete the multiplication table for any number n (entered from the keyboard).

Example:

for n = 9

1 * 9 = 9

2 * 9 = 18 ...

9 * 9 = 81

Exercise 04

Write a program asking the user to enter a positive integer. The input will be repeated until the number is positive. Same question for a positive integer multiple of 3.

Exercise 05

Write a program that asks the user for an integer N, then buys N rows of integers from 1 up to the row number (Display A).

Modify the program so that it displays N columns of integers from 1 up to the column number (Display B).

Example: for N = 5, the program should display :

(A)	(B)
1	1
1 2	2 1
1 2 3	3 2 1
1 2 3 4	4 3 2 1
1 2 3 4 5	5 4 3 2 1

Exercise 06

Write a program to represent a game whose aim is to guess an integer given by the first player. The number must be between 0 and 100. The program asks the second player to guess the number, telling him whether his guess is bigger or smaller than the number to be guessed, until he finds the right answer. The number must be found at the lowest possible cost. Here's an example:

- Is it 2
- Too small
- Is it 9
- Too big
- Is it 7
- Congratulations, you've won in 3 moves !