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Academic year: 2023-2024

Level: 1<sup>st</sup> year “Computer Science & Mathematics”

Module: Algorithmic and Data Structures 2

TP n°2

Pedagogic objectives

→ Handle procedures & functions in C;

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Exercise n°1

- Write function **int power( int x, int y)** which takes two integer parameters  $x$  and  $y$  and returns  $x^y$ . Also give an example of calling this function by writing a main function in which you display the calculation result.
- Same question, but this time we want to pass the result by variable. The function header therefore becomes **void power( int x, int y, int \*r)**.
- Write a **division function** that performs integer division and returns both the quotient and remainder by variable, and the main function that calls it.

Exercise n°2

- Write a function **grab** that allows you to grab an array of integers.
- Write a function **display** that displays the elements of the array.
- Write a function **calculate\_average**, which allows you to calculate the average of the elements of an array.
- Write a function **find\_min\_max**, which allows you to find the minimum and maximum between the elements of an array.
- Write the main program.

### **Exercise n°3**

**F** is a numerical function defined by  $F(X) = X^3 - 2X + 1$ . We want to construct an array of values of this function. The user enters the number **N** of values as well as the values of **X**. Write a program that matches this processing.

#### **Example :**

Enter an integer between 1 and 100: **9**

Enter 9 real numbers: |-4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 |

**X** | -4.0 | -3.0 | -2.0 | -1.0 | 0.0 | 1.0 | 2.0 | 3.0 | 4.0 |

**F(X)** |- 55.0|- 20.0| -3.0| 2.0 |1.0|0.0 | 5.0 | 22.0| 57.0|

**NB** : the solution must include subprograms.