REPUBLIQUE ALGERIENNE DEMOCRATIQUE ET POPULAIRE
MINISTERE DE L'ENSEIGNEMENT SUPERIEUR ET DE LA RECHERCHE SCIENTIFIQUE

Université de M'sila
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Département d'informatique

جامعة المسيلة
كلية الرياضيات والإعلام الآلي
قسم الإعلام الآلي

Level: 1st year of computer science
Course: ADS1

series TD/TP N°: 04

Academic year:2024/2025
Chapter 3 : Tests

Exercise 1 : TD

Write an algorithm that allows entering 3 integers. Then, this algorithm only displays the odd numbers.

Exercise 2: TP

Write a program that calculates the maximum between 2 numbers and another one that calculates the maximum between 3 numbers.

Exercise 3: TD/TP

Write an algorithm with its C program that calculates the alms or zakat. This algorithm receives a person's wealth along with the price of one gram of gold. Then, it displays the zakat amount. Knowing that the zakat rate is 2.5% and the Nisab threshold is 85 grams of gold.

Exercise 4: TD

Write an algorithm that reads a year A and informs us if this year is a leap year (February has 29 days) or not.

N.B.:

- If A is not divisible by 4, the year is not a leap year.
- If A is divisible by 4, the year is a leap year unless A is divisible by 100 and not by 400.

Exercise 5: TP

Write an algorithm with its C program that allows reading two integers A and B and checks if A is divisible by B , or if B is divisible by A. If neither is divisible, output a message indicating that.

Exercise 6: TD

Write an algorithm that calculates the average of the analysis (exam and tutorials) and do not display the average. Then, if the average is below 10/20, it asks the user to provide the make-up grade. In this case, the calculation of the final average considers the better grade between the original exam and the make-up exam, and finally, the algorithm displays the final average.

Exercise 7: TD/TP

Write an algorithm and its program that calculates i^n where i is the imaginary number $i = \sqrt{-1}$

Exercise 8: TP

Write a program that reads a character, and if it is a letter, it displays it in uppercase; otherwise, it displays it as it is.

Exercise 9: (at home**)**

Write an algorithm and its program for a mini-calculator that offers the user to perform one of the following operations (addition of two numbers, subtraction of two numbers, division of two numbers, multiplication of two numbers, square root of a number, and power of a number).

Exercise 10: (at home**)**

Write an algorithm with its program that allows solving a quadratic equation.

$$Ax^2 + Bx + C = 0$$

Exercise 11 : (at home**)**

A store sells 3 products, p1, p2, and p3, with respective prices of 24 DA, 32 DA, and 43 DA. A discount of 1% is granted if the pre-tax amount exceeds 220 DA, and a discount of 2% is given if it surpasses 560 DA. Write an algorithm with its C program that reads the quantity purchased for each product, and then it displays:

- The total price of each product,
- The total pre-tax price,
- The total pre-tax price after the discount,
- The amount of VAT, knowing that the VAT rate is 19%,
- The total amount to be paid.