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

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قسم الإعلام الآلي

Level: 1st year of computer science **Course**: ADS1	**series TD/TP N°: 06**	**Academic year:**2023/2024 **Chapter 5** : Arrays

Exercise 1: TD/TP
Write an algorithm with its C program that allows filling an array of N real numbers and then displays them in reverse order.

Exercise 2: TP
Write an algorithm to find the MAX and its position in an array of N real elements.

Exercise 3: TD
Write a C program to calculate the scalar product of two N-dimensional vectors. If u is the vector of grades and v is the vector of coefficients, modify the program to calculate the average.
N.B.: The scalar product of two vectors is equal to the sum of the products of their corresponding components. $\vec{u} \cdot \vec{v} = \sum u_i . v_i$

Exercise 4: TP
Write an algorithm to calculate the number of occurrences of a given element in an integer array of N elements.

Exercise 5: TD
Write an algorithm with its C code that splits a vector T of N integers into two vectors T1 and T2, containing the even and odd numbers of T, respectively.

Exercise 6: (at home)
Write an algorithm with its C program that allows filling an array of N real numbers and calculating the sum of negative numbers, the product of positive numbers, and the count of zeros.

Exercise 7: (at home)
Write an algorithm with its C program that converts a decimal number to an octal number using an array to store the remainders and then displays them in reverse order
Ex : 964

4	0	7	1		

To display 1704

Exercise 8 : (at home)
A polynomial will be represented using an array of floating-point numbers containing its coefficients. The coefficient of degree i will be found in the array element at index i.
For example, the polynomial $2.5 + 4X + 8X^3$ will be represented by the array [2.5, 4, 0, 8]. A polynomial of degree d will have a size of d+1.
Write an algorithm that:
- Reads the coefficients of the polynomial of degree d.
- Displays this polynomial, ignoring terms with coefficients of 0.
- Calculates the value of the polynomial for the given value x (provided by the user without using pow()).
- Calculates the derivative of this polynomial