University of Djilali BOUNAAMA Khemis Miliana **Algorithms and Data Structures II**
Faculty of Sciences and Technology **1st year MI**
Department of Mathematics and Computer Science **AZZOUZA N.**

SW N°1 : RECORDS AND FILES

Exercise 1 : The library (Exam ADS-II 2020-2021)

Consider the following records :

```
Type        Date = Record                          Book = Record
                day, month, year : integer ;           ISBN : string [12] ;
            EndDate                                     title : string [50] ;
                                                        language : string [25];
            Person = Record                            Date_edition : Date ;
                Last_name, first_name: string [30] ;   pages_nbr : integer ;
                Date_birth : Date ;                     Author : Personne ;
                Nationality : string ;                 EndBook
            EndPerson
```

Let **T** be an array of at most 1000 books.

1. Display, from T, books written by Algerians in French.
2. Show the names of authors who published a book after the age of 60.
3. Find and view the book with the most pages.

Exercise 2 : Residents

Consider the following records :

```
Type  Date =  Record
                day, month, year: integer ;
            EndDate

        Address =  Record
                Number : integer ;
                Street: string[50] ;
                City, Wilaya: string[25];
            EndAddress.

        Resident =  Record
                Last_name, first_name: string[50];
                Date_naiss: Date ;
                Residence: Address;
            EndResidant
```

1. Write a program that allows you to:
   a) Fill an array T with N residents (N <= 100)

   b) Display from T the residents born before a given year « birth_year"

   c) Display the names and dates of birth of the residents of the city of "zemmouri" in the wilaya of "Boumerdès"

   d) Save in a file G of type resident, the residents of the wilaya of Algiers appearing in array T.

Exercise 3 :

Consider the following record :

```
Type Student = Record
                Matricule : integer ;
                Last_name, first_name: string ;
                Score : Real ;
          EndStudent.
```

Let **T** be an array of at most 100 students.

1. Write an algorithm to copy all admitted students belonging to T into an "ADMIS" file. A student is admitted if his score is greater than or equal to 10.

Exercise 4 :

Consider the following type :

```
Type Product = Record
                Code : integer ;
                Designation : string[100] ;
                Price : Real ;
          EndProduct.
```

Let F be a file of products.

1. Write an algorithm to display the most expensive product in file F.