

DIRECTED WORK SERIESNO. 0

Module: Algorithms and data structures 2

Academic year: 2025/2026

Exercise 1

A clinic wants to automate the management of its patients (sick people) and entrusts you with this task. For this, a patient will be identified by: patient number, last name, first name, date of birth (Day, Month and Year), telephone number, address and the name of their illness.

- 1) Write the data structures necessary to define a patient and a structure allowing the management of 1800 patients?
- 2) Write an algorithm to display a patient searched for by number?
- 3) Modify the algorithm so that it displays all patients in the wilaya of Mila?

Exercise 2

The Wilaya of Mila wants to automate the management of its municipalities and entrusts this task to you. For this, a municipality will be identified by: municipality number, name, date of creation (Day, Month and Year), surface area and number of inhabitants.

- 1) Write the data structures necessary to define a municipality and a structure allowing the management of 50 municipalities?
- 2) Write an algorithm that performs the following tasks:
 - a) Enter **N** municipalities in the table.
 - b) Display the municipalities which have a number of inhabitants lower than a **Nbr** number and their creation dates do not exceed **15 years**?

Exercise 3 (supplementary)

The administration of computer science department wants to automate the management of its students and entrusts this task to you. For this, a student will be identified by: his student number, his last name, his first name, his date of birth (which will be broken down into day month and year), year of study, a table containing the averages for the 6 EU prepared (for the current year).

- 1) Write the data structures necessary to define a student and a structure allowing the management of **1500 students**.
- 2) Write an algorithm allowing the following tasks:
 - a) Search for a student by number.
 - b) Display students searched by first and last name.