PRACTICAL WORK SERIES NO. 0: STRUCTURES (RECORDS)

Module: Algorithms and data structures 2   Academic year: 2025/2026

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1. Declaration of a Record:

In the C++ language, a structure (record) type is declared as follows:

//cpp

```cpp
struct TypeName
{
   Type1  FieldName1;
   Type2  FieldName2;
   // ...
   TypeN   FieldNameN;
};
```

Example:

Let's declare a student type that contains the following data: name, firstname, and registration date, where the registration date consists of day, month, and year. So, we first declare a date type containing three fields: day, month, and year. Then, we define the student type:

//cpp

```cpp
struct Date
{
   int day;
   int month;
   int year;
};
```

// Declare and define the structured type student

```cpp
struct Student
{
   char name[20];
   char firstName[20];
   Date registrationDate;
};
```

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// Declare two variables of type student

Student E1, E2;

2. Reading and Writing Records:

Here's an example illustrating essential operations on this type:

```cpp
//cpp
// Reading data into a student record
cout << "Enter the name for student E1: ";
cin >> E1.name;

cout << "Enter the first name for student E1: ";
cin >> E1.firstName;

cout << "Enter the registration date for student E1 (day month year): ";
cin>>E1.registrationDate.day>>E1.registrationDate.month>> E1.registrationDate.year;

// Writing data from a student record
cout << "Student E1 information:\n";
cout << "Name: " << E1.name << "\n";
cout << "First Name: " << E1.firstName << "\n";
cout <<"Registration  Date: "  <<E1.registrationDate.day<<"/"  <<E1.registrationDate.month
<< "/" << E1.registrationDate.year << "\n";
```

This example demonstrates the basic operations for declaring, defining, reading, and writing records in C++ using structures.

Task to be performed :

"The Wilaya of Mila wants to automate the management of its municipalities and has entrusted you with this task. For this purpose, each municipality will be identified by its municipality number, name, creation date (Day, Month, and Year), surface area, and population.

1) Write the necessary data structures to define a municipality and a structure for managing 50 municipalities.

2) Write a C++ program that performs the following tasks:
  a) Input information for n municipalities into the array.
  b) Display municipalities with a population less than a specified number (Nbr), and their creation dates do not exceed 15 years."