



Academic year: 2023-2024

Level: 1st year “Computer Science & Mathematics”

Module: Algorithmic and Data Structures 2

TD n°9

Pedagogic objectives

- Understand the usefulness of custom types and manipulate them to solve different problems.

Exercise n°1:

Define a TIME type (record) which contains the fields: hour, minute, second.

1. Write an algorithm which allows you to perform the sum T of two durations T1 and T2 of type TIME.
2. Write an algorithm which allows you to transform a time T of type TIME into an integer S which expresses this time in seconds. Example: for T = 2 hours 10 minutes 37 seconds, S = 7837 seconds.

Exercise n°2:

A complex number C is defined by its real “a” and imaginary “b” parts ($C = a + bi$).

Write an algorithm that reads two complex numbers C1 and C2 and then displays their sum and product.

Exercise n°3:

“Ens” is a record defined by two pieces of information (fields):

- T_Pos an array of integers that can contain a maximum of 50 elements;

- N the number of elements of the array T_Pos .

Given a string Ch , write an algorithm which allows you to search for the string "ab" and put in a record of type Ens (in the table T_Pos) all the positions of the string "ab" in Ch.

Example: Ch = ' faabaababbaabrs ' .

Positions: 3, 6, 8, 12 => T_Pos [1]=3, T_Pos [2]=6, T_Pos [3]=8, T_Pos [4]=12.

Number of elements: 4 => N=4.