

Assignment 2 Control Structures

Exercise 1

Consider the following compound conditional structure.

if (Condition1) then	Based on the principle of nested conditional structures seen in the course, what are the instructions that execute in the following cases?
Instruction1 ;	
if (Condition2) then	
Instruction2 ;	1- Cond1 = Vrai, Cond2 = Vrai, Cond3 = Vrai
else	
Instruction3 ;	2- Cond1 = Vrai, Cond2 = Vrai, Cond3 = Faux
endif	
else	3- Cond1 = Vrai, Cond2 = Faux, Cond3 = ?
if (Condition3) Alors	
Instruction4;	4- Cond1 = Faux, Cond2 = ?, Cond3 = Vrai
endif	
Instruction5;	5- Cond1 = Faux, Cond2 = ?, Cond3 = Faux
endif	

Exercise 2

The progression of a student from the first year of LI to the second year is determined by the following criteria:

Passed: if the overall average of both semesters S1 and S2 is equal to or greater than 10.

Passed with a condition: if the overall average is less than 10, but the total credits of both semesters are at least 30, with a minimum of 10 credits in one semester and 20 credits in the other.

Deferred: otherwise.

Write an algorithm that reads the averages of S1 and S2, the credits for S1 and S2, and then displays whether the student is passed, passed with conditions, or deferred.

Exercise 3

Write algorithm that allows reading an integer X and displays whether it is positive or negative, even or odd.

Exercise 4

Write algorithms that allow to:

- 1- Read three variables A, B, and C then:
- 2- Determine the largest of the three integers A, B, C.
- 3- Determine the smallest and the largest of three integers A, B, and C, minimizing the number of comparisons performed.
- 4- Display these three variables (values) in ascending order.

Exercise 5

We say that 3 segments can form a triangle if the sum of the lengths of the 2 smallest sides is greater than the length of the largest side. Write an algorithm that verifies whether three numbers can be the lengths of the sides of a triangle.

Exercise 6

Write an algorithm that prompts the user for a number N composed of four digits and then displays this number in words. Example: If N = 3235, then the program displays: three thousand two hundred thirty-five.

Exercise 7

Write an algorithm that displays the absolute value of the difference between two real numbers entered via the keyboard.

$$\left\{ \begin{array}{ll} |x - y| = x - y & \text{if } x > y \\ |x - y| = -(x - y) & \text{if } x < y \end{array} \right.$$

Modify your algorithm so that it can handle the case where x and y are equal.

Exercise 8

Write an algorithm that, based on the number of a month, displays the corresponding season. **Example:**

If month = 1, then the program displays Winter.

If month = 6, then the program displays Summer.

Modify the algorithm to display the number of days corresponding to each month.