# DIRECTED WORK SERIESNO. 4

Module: Algorithmic and data structures1                    Academic year: 2023/2024

## Exercise 1

Write algorithms that allow you to:

1) reads an integer X then displays whether it is positive or negative.
2) reads an integer X then displays whether it is positive or negative or zero.

## Exercise 2

Consider the following algorithm:

```
Algorithm exercise2
a, b, c, d: integer ;
Begin
Read (a,b,c,d);
If(a > 0)then
a ← a+1 ; b ← b+a ; c ← c+b ; d ← d+c ;
else
If(b > 0)then
a ← - a ; c ← - c ;
End if;
If(c >0)then
a← a+3; b ← b+3; c ← c+3; d ← d+3;
else
If(d > 0)then
a ← a+4 ; b ← b+4 ; c ← c+4; d ← d+4;
End if;
If(a > 0)then
a ← a+10; b ← b+10; c ← c+10; d ← d+10;
End if;
End if;
End if;
Write (a,b,c,d);
END.
```

Give the output values of variables **a, b, c** and **d** in the case of the following input values:
1) (a=1, b=1, c=1, d=1)
2) (a=-1, b=-1, c=1, d=1)
3) (a=-1, b=1, c=-1, d=1)
4) (a=-1, b=1, c=1, d=1)
5) (a=-1, b=1, c=1, d=-1).

## Exercise 3

Write an algorithm that reads three variables **a, b** and **c** then displays these three variables (values) in ascending order.

# Exercise 4

Write an algorithm that asks the user for the average of a student's Algebra1, Analysis1 and Algorithmicmodules. Then calculates and displays the total credit of the fundamental unit composed of its three modules. Knowing that :

➢ The credit of Algebra1module is 5, and of Analysis1 is 6 and of Algorithmic is 6.

➢ The coefficient of Algebra1 moduleis 2, and of Analysis1 is 4, and of Algorithmic is 4.

➢ The credit of the fundamental unit is 17 if its average is ≥10, otherwise it is the sum of the credits of the moduleswhich have an average ≥10 (in this case, the credit of a moduleis 0 if its average is <10 ).

*Noticed :*The unit average is calculated from the coefficients and averages of the modules.

# Exercise 5

Write a calculator algorithm allowing the reading of a first integer A, the operation (+ or – or * or /) and the second integer B, then displays the result.

*Example :*



Enter the first integer:
4
Give the operation:
+
Enter the second integer:
12
The sum of 4 and 12 is equal to:
16