Larbi Ben M'hidi-Oum El Bouaghi- University
Faculty of Exact Sciences and Natural and Life Sciences
Mathematics and Computer Science Department

Level: Admitted with debts **Date:** 09/01/2025

Module: Algorithmic and Data Structures 1 **Duration**: 1h30m

Exam n°1 « Typical correction »

Exercise n°1 (6 points)

Algorithm tests

Variables code1, code2, code3: integer; **(0.5 point)**

Begin

Write (« Enter the first code ») ; Read (code1); **(1 point)**

```
If (code1>=1 and code1<=5) then
  Write ("Enter the second code"); Read (code2);
   If (code2>=97 and code2>=100) then
      Write ("Enter the third code"); Read (code3);
         If (code3=321) then
            Write ("Welcome");
         else
            Write ("incorrect code");
        endif
    else
         Write ("incorrect code");
   endif
 else
         Write ("incorrect code");
 Endif
```

(4.5 points)

End

Exercise n°2 (6 points)

Algorithm population

Variables Nbrs_years: integer; pop_alg, pop_const: real; **(0.5 point)**

Begin

```
pop_alg ← 7000000;
pop_const ← 1000000;
Nbrs_years ← 0;
```

(1.5 point)

```
While (pop_alg > pop_const) do
  pop_alg ← pop_alg +5000 ;
  pop_const ← pop_const+ (pop_const*0.08);
  Nbrs_years ← Nbrs_years+1;
Endwhile
```

(4 points)

Write ("Constantine will exceed Algiers after", Nbrs_years,"years");
END

Exercise n°3 **(8 points)**

```
Algorithm students_marks;
Variables   T: array[1..40] real;  S , Moy, max,min, X : real ;          (0.5 point)
            n,i,j,k,a,c,p: integer;
Write ("Enter the number of marks ");
Read (n);
If (n=0) then
Write ("Array is empty");
Else
For i←1 to n do
Write ("Enter the mark n°", i);                                          (1.5 point)
Read (T[i]);
Write (T[i]);
S←S+T[i];
Endfor
Moy← S/n ;
Write ("The average of marks is Average =",Moy);
-----------------------------------------------------------------------------------------------------
max←T[1];
For  i← 2 to n do
 If (T[i]>max) then                                                      (1.5 point)
       max←T[i];
  Endif
 Endfor
Write("The maximum mark is  max= ", max);
-----------------------------------------------------------------------------------------------------
min← T[1];
For i← 2 to n do
 If (T[i]<min) then                                                      (1.5 point)
       min←T[i];
Endif
Endfor
Write ("The minimum mark is min= ", min);
-----------------------------------------------------------------------------------------------------
Write ("Give the requested element ");
Read (X);
a←0;
For i← 1 to n do
If (T[i]=X) then                                                         (1.5 point)
a←1;
Endif
Endfor
If (a<>0) then
Write ("The mark" ,X, " find in the array ");
 Else
```

```
Write ("The mark ",X," does not exist");
Endif
-----------------------------------------------------------------------------------------------------------
Write ("Give an element to determine the number of occurrences ");
Read (X);
c← 0;
For i← 1 to n do  If (T[i] = X) then c← c+1; Endif
Endfor
Write ("The number of occurrences of " ,X, " is =",c);
END
```

(1.5 point)