Badji Mokhtar Annaba University
Faculty of Technology
Computer Science Departement
Computing and Automation 01, Semester 01, Algorithms and Data Structure 01

First Serie of Exercice for directed coursework

All the exercices must be written in C durig practical tutorial

Algorithms Structures :

For each problem , identify the inputs, the outputs, and the steps to solve it.

1. Computing the perimeter of a rectangle.
2. Computing the sum of two complex numbers.
3. Name the **angle type** by introducing its values in degree. name could be:
   - **Nul** angle==0°,
   - **Acute** 0°<angle < 90°,
   - **right** angle==90°
   - **straight**==180°

Variables, constants and assigments

- Write an algorithm to find the square of a given number **N,** run it for **N=3**, and draw the state of the memory.
- Create a flowchart to represent the previous algorithm.

-Declare a constant named "TAX_RATE" and assign it the value of 8% . Write an algorithm to calculate the total cost of a $50 purchase, including tax, display to the user the price with and without tax.

-Write a program that declares two variables, "length" and "width," and assigns values to them. Calculate and display the area of a rectangle using the formula: area = length * width.

Write a program that declares three integer variables: "x," "y," and "z." Assign values to them and calculate the result of the expression: (x + y) * z. Display the result.

-Swap the values of two integer variables, "m" and "n," using a third variable z.

-What this Algorithm do ? Run it for m=5 and n=10 and draw the memory trace at each step.

```
Algorithm TEST;
var
   m : int:
   n : int;
            begin
                  read(m);
                  read(n);
                  print("values of n and m",n,m);
                  m ← m + n;
                  n ← m  - n;
                  m ← m – n;
                  print("values of n and m",n,m);
            end;
```

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```
Algorithm test2 ;
Var
    A, B, C : int ;
    D : int ;
Begin
 A ← 5 ;
 B ← 0;
 B←B+1;
 C ← A / B*2 + 3 ;
 D ← (C mod A) + (C div B) ;
 D← Non (D)
 print (A,B,C,D) ;
end;
```

Run the above algorithm, and print its outputs, also draw the memory trace (each variables at each instructions).

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