Tutorial No. 2

Algorithmic (1)

Exercise 1:

What will be the values of variables A and B after executing the following statements?

Input variables: A, B **Integer** **Output variables:** **Begin** A = 1 ; B = A + 3 ; A = 3 ; **End**	**Input variables:** A, B **Integer** **Output variables:** **Begin** A = 5 ; B = A + 4 ; A = A + 1 ; B = A – 4 ; **End**	**Input variables:** A, B, C **Integer** **Output variables:** **Begin** A = 3 ; B = 10 ; C = A + B ; B = A + B ; A = C ; **End**

Exercise 2: Consider the following algorithms:

Name: algo1; **Input variable:** N1, N2integer; **Output variable:** **Intermediate variable:** **Begin** Write ("give the number N1 "); Read(N1); Write ("give the number N2"); Read(N2); N1=N2 ; N2=N1; Write(N1,N2) **End.**		**Name:** algo2; **Input variable:** N1, N2integer; **Output variable:** **Intermediate variable:** C ; **Begin** Write ("give the number N1 "); Read(N1); Write ("give the number N2"); Read(N2); C=N1 ; N1=N2 ; N2=C ; Write(N1,N2) ; **End.**

1) Give the execution result for the two algorithms (algo1, Algo2), with N1=15 and N2=3.

2) Deduce the role of the algorithm (Algo2).

Exercise 3

Establish an algorithm that can display: the sum, the product and the average of 4 real numbers.

Exercise 4:

Establish an algorithm that displays the perimeter (المحيط) of a triangle.

Exercise 5:

We have three integer variables A, B and C. Write an algorithm transferring to B the value of A, to C the value of B and to A the value of C.

Exercise 6:

Write an algorithm, which asks the user for two numbers and displays the greater one.

Exercise 7:

Write an algorithm, which asks the user for the temperature of the water and displays its state (solid, liquid, vapor).

Additional Exercises

Exercise 1

Write an algorithm, which calculates the quotient of two numbers: a/b (assuming that b is different from 0).

Exercise 2

Give an algorithm then a flowchart, which from a unit price and a number of items provided in data, make it possible to calculate: the price excluding tax, the VAT(Value Added Tax) and the corresponding price including tax. The VAT rate will always be assumed to be equal to 17%.

Exercise 3

Write a program that asks the user for a number, then calculates and displays the square of that number.

Exercise 4

Write an algorithm that asks the user for a number, and then informs him if that number is positive, negative, or zero.

Solution

Exercise 2 :

1 **Algo1 :**

N1=15
N2=3
N1=N2→N1=3
N2=N1→N2=3
Display by the function<Write>**(N1=3,N2=3)**

Algo2

N1=15
N2=3
C=N1→C=15
N1=N2→N1=3
N2=C→N2=15
Display by the function<Write>**(N1=3,N2=15)**

2 **The role of the algorithm (Algo2) is: the permutation between two integers.**

****

Exercise 3 :

Nom : exercise 3
Input variable: A, B, C, D float;
Output variable: S,P,M float ;
Begin
read(A) ;
read(B) ;
read(C) ;
read(D) ;
S=A+B+C+D ;
P=A*B*C*D ;
M=S/4;
write("the sum =",S) ;
write(« the product =",P) ;
write("the average =",M) ;
End.

Exercise 4 :

Nom : exercise 4
Input variable: A,B,C integer;
Intermediate variable:
Output variable: P integer;
Begin
read(A)
read(B)
read(C)

P=A+B+C ;
write("The perimeter =",P) ;
End.

Exercise 5:

Nom : exercise 5
Input variable: A,B,C integer;
Intermediate variable: X,Y integer;
Output variable:
Begin
read(A) ;
read(B) ;
read(C) ;
X=B ;
B=A ;
A=C ;
C=X ;

write("A=",A) ;
write("B=",B) ;
write("C=",C) ;
End.

Exercise 6

Nom : exercise 6
Input variables: A, B Integer;
Begin
read(A);
read(B);
if(A>B) then **begin-if**
Write("A>B");
end-if
elsebegin-else
if(A==B) then **begin-if**
write("A=B");
end-if
else begin-else
write("A<B");
end-else
end-else
End.

Exercise 7:

Name: Exercise 7;
Input Variables: T Integer;
Intermediate variable:
Output Variables:
Begin
read(T);
if(T>100) then **begin-if**
write("steam");
end-if
else begin-else
if(T<=0) then **begin-if**
write("solid");
end-if
else begin-else
write("liquid");
end-else
end-else
End.