

TD N° : 01

Exercice 1 :

1. Give a mathematical expression which indicates whether an integer 'x' is the square of the number 'y'.
2. Give a logical expression which shows whether an integer 'x' belongs to the interval [Min, Max [.

Exercice 2 :

For each statement, analyze the solution by proposing the required inputs, the expected outputs and the resolution method. (Use the black box principle)

1. Statement 1: The sum and product of two real numbers a, b.
2. Statement 2: Comparing and displaying the largest between two integers (x, y).
3. Statement 3: Check if an integer x is perfect.

Exercice 3 :

Which of the following identifiers are correct (incorrect) variable names and why?

Z, z, 2c, printf, sum, \$x, p_1, p:1, Product, value, _Tab1, TD, const, sum values, sum_values.

Exercice 4 :

Consider the following variables, defined and initialized in the table below:

Variable	Type	valeur
i	integer	-14
j	integer	43
x	real	16.26
A	boolean	False
B	boolean	True

Determine the value of each of the following expressions and give its type.

1. $(i + j) \bmod 2$
2. $x / 3$
3. $i \text{ div } 3$ (div for the integer division)
4. A and B
5. A or B
6. $\text{not} ((A \text{ or } B) \text{ and } B)$
7. $i = j$
8. $(B \text{ and } (i < j))$

Exercise 5 :

Write an algorithm that :

1. Asks the user to enter (enter) four integers,
2. Reads the four integers on the keyboard,
3. Calculates the average of these integers and,
4. Finally displays the result on screen.

Exercise 6 :

Write an algorithm that decomposes a given integer between 0 and 999 into its constituent digits. The numbers are then displayed from highest weight to lowest weight.

Examples:

Data: 21 Result: 2, 1

Data: 364 Result: 3, 6, 4

Exercise 7 :

Consider two real numbers 'x' and 'y'. Write an algorithm that:

1. Read these two numbers,
2. Swaps between these two numbers and displays the new values

Exercise 8 :

Write an algorithm that displays a message asking the user to enter an integer (representing a number of months), calculates and displays its equivalent in number of years and months.

Remark. As the year is 12 months, we then have the following relationship between the data (input) and the result (output):

$$\text{number_of_months} = 12 * \text{year} + \text{months}$$

Exercise 9 :

Write a program in C, which for a sum of money less than 1000 DA, displays how to divide it into coins.

Example:

Input money: 825 DA

Result:

1 coin of 500 DA

1 coin of 200 DA

1 coin of 100 DA

1 coin of 20 DA

1 coin of 5 DA