

Series of 1st supervised exercises

Exercise 1

Either the following problems:

1. Calculation of the perimeter of a circle with radius R
2. Calculation of the area of a disc with radius R
3. Calculation of the sum of two complex numbers
4. Calculation of the product of two complex numbers
5. Solution of a second-degree equation in the set of real numbers (R).
6. Deliberation of a group of 20 students, displaying for each student: their name, surname, registration number, average, and the deliberation decision of the jury, either "Admitted" or "Deferred". Knowing that:
 - All students in the group take 4 modules (M1, M2, M3, and M4).
 - The respective coefficients of the modules are: 2, 1, 3, and 2.
 - The student is declared "Admitted" if their average is 10 or higher, otherwise they are declared "Deferred".

Question: Determine for each of the previous problems

- The input data.
- The output results.
- The main steps for solving,

Exercise 2

1. We have $a = 4$, $b = 5$, $c = -1$ et $d = 0$, Evaluate the following logical expressions:
 - $(a < b) \text{ AND } (c \geq d)$
 - $\text{NOT } (a < b) \text{ OR } (c \neq b)$
 - $\text{NOT } [(a < b) \text{ OR } (c \neq b)]$
 - $\text{NOT } ((a \neq b^2) \text{ AND } (a * c < d))$
2. Knowing that : $A = \text{TRUE}$, $B = \text{FALSE}$, $C = \text{TRUE}$; evaluate the following logical expressions:
 - $(A \text{ OR } B) \text{ AND } (A \text{ OR } C)$
 - $(\text{NOT } A \text{ AND } B) \text{ OR } (A \text{ AND } \text{NOT } B)$
 - $(A \text{ AND } B) \text{ AND } (B \text{ AND } C) \text{ OR } (C \text{ AND } A)$
 - $(A \text{ AND } B) \text{ OR } (B \text{ AND } C) \text{ AND } (C \text{ AND } A)$
 - $(A \text{ OR } (A \text{ AND } B)) \text{ AND } (A \text{ OR } (B \text{ AND } C))$
3. Knowing that $A=3$, $B=4$, $X=3.0$, $Y = -1.0$, $C='K'$ et $F=\text{False}$.
Specify the evaluation order as well as the value of each of the following expressions below:
 - $-X * A + Y$,
 - $B - A / Y + 2$,
 - $(4 + A * 4 - B + (A + 2^4)) / (Y - 9 + 6 * 3)$,
 - $((B - 2) / (Y / 3)) / 2 * ((5 * X) - 4^2)$,
 - $F \text{ AND } \text{NOT}(C < 'A')$,
 - $(X > Y) \text{ OR } (A > B)$,
 - $(X \leq Y) \text{ AND } (A < B)$.

Exercise 3

What is the type of each variable: A=1, B=TRUE, test= 12.23, specialite='m',

Exercise 4

Let A and B be two variables of integer type; C and D be two variables of real type; E and F be two variables of boolean type

What is the type of the following variable: A1, B1, C1, A2, B2, C2, D2, A3, B3, C3, D3

A1 ← A+B ; B1 ← A*B; C1 ← A/B; A2 ← C+D; B2 ← C*D; C2 ← C/D; D2 ← true; A3 ← E and F; B3 ← E and F; C3 ← (A>B) ; D3 ← A*C;

Exercise 5

What are the valid identifiers and those that are not valid? A, cA, 12, 1exo, exo2, A12m, batna ,valide?, if,exo 1, égale.

Exercise 6

Let be the following algorithms :

```
Algorithm Algo_01 ;
Var A, B, C : integer ;
    D : boolean ;
Begin
    A ← 5 ;
    B ← 6 ;
    C ← A + B*2 + 3 ;
    D ← (C mod A) < (C div B) ;
    Write (A,B,C,D) ;
end.
```

```
Algorithm Algo_02 ;
Var A, B, C : integer ;
    D : boolean ;
begin
    Read (A) ;
    Read (B) ;
    C ← A + B*2 + 3 ;
    D ← (C mod A) < (C div B) ;
    write (A,B,C,D) ;
End.
```

```
Algorithm Algo_03 ;
Var x, y : real ;
Begin
    x ← 10 ;
    y ← x * 2 ;
    Write (x, " *2= ", y) ;
End.
```

```
Algorithm Algo_04 ;
Var x, y : real ;
Begin
    Read (x) ;
    y ← x * 2 ;
    Write (x, " *2= ", y) ;
End.
```

Questions :

1. Perform the trace of algorithm **Algo_01** and algorithm **Algo_02**.
2. What results does algorithm **Algo_03** produce?
3. What results does algorithm **Algo_04** produce?
4. What is the difference between the last two algorithms? .