



Level: 1st year of computer science
 Course: ADS1

Typical solution TD/TP N°: 02

Academic year: 2023/2024
 Chapter 2 : Variables

Exercise 1 :

Determine the error if it exists for each identifier

- 5TD : begins with a number
- _3: correct but to be avoided
- good luck: contains the space
- TP : correct
- mathématiques : contains "é"
- Δ : prohibited character
- D-A: contains "-"
- end: reserved word
- TP: already declared

Exercise 2:

Give the type and result of the following expressions, in algorithm and in C language.

- a) $5-3.*2+2$: real =1.0
- b) $10/5*5$: real =10.0
- c) $(7+6) \bmod 5$: integer =3
- d) $12 \text{ div } 2 > 17 \bmod 5 *2$: Boolean =true
- e) $1380 \text{ div } 60 \bmod 60$: integer =23
- f) $'h'>'Q'$ and $17>5$: Boolean = true
- g) $\text{non} ('h'>'Q')$: Boolean = false

Rewrite the above expressions in C language.

- a) $5-3.*2+2$
- b) $10*1.0/5*5$
- c) $(7+6) \% 5$
- d) $12 / 2 > 17 \% 5 *2$
- e) $1380 / 60 \% 60$
- f) $'h'>'Q' \ \&\& \ 17>5$
- g) $!('h'>'Q')$

Exercise 3:

Give the values of the variables after the execution of each instruction of this algorithm.

Algorithm Exo3

var A, B: integer	A	B
Begin		
$A \leftarrow 7$	7	/
$B \leftarrow A-4$	7	3
$A \leftarrow A-1$	6	3
$B \leftarrow A+5$	6	11

End

Exercise 4:

Give the values of the variables after execution.

Algorithm Exo4

var A, B: integer	A	B
Begin		
$A \leftarrow 7$	7	/
$B \leftarrow 5$	7	5
$A \leftarrow B$	5	5
$B \leftarrow A$	5	5

End

- Does this algorithm allow to exchange the values of A and B? no
- Propose changes to exchange the values of A and B

add a temporary variable

Algorithm Exo4_v2

var A, B, tmp: integer

Begin

$A \leftarrow 7$
 $B \leftarrow 5$
 $\text{tmp} \leftarrow A$
 $A \leftarrow B$
 $B \leftarrow \text{tmp}$

End

Exercise 5:

Let's consider the following algorithm:

Algorithm Exo5

var a, b: integer

Begin

$a \leftarrow 7$
 $b \leftarrow 5$
 $a \leftarrow a * b$
 $b \leftarrow a/b$
 $a \leftarrow a/b$

End

- What does this algorithm do?
 exchanges the values of A and B.



Exercise 1:

- 1) Create a new project
- 2) Declare a variable x of integer type.
- 3) Initialize x to 100
- 4) Display x in octal, decimal, hexadecimal, and as a character.
- 5) Display its square and its cube

```
#include <stdio.h>
int x;
int main(){
    x=100;
    printf("%o\t%d\t%x\t%c\n",x, x, x, x);
    printf("its square =%d\tits cube=%d\n",x*x, x*x*x);
    return 0;
}
```

Exercise 2:

Using the printf display instruction, write a program that displays the result of each expression from **Exercise 2** of the TD.

```
#include <stdio.h>
int main(){
    printf("%f\n", 5-3.*2+2);
    printf("%f\n", 10*1.0/5*5);
    printf("%d\n", (7+6) % 5);
    printf("%d\n", 12 / 2 > 17 % 5 *2 );
    printf("%d\n", 1380 / 60 % 60 );
    printf("%d\n", 'h'>'Q' && 17>5);
    printf("%d\n", !('h'>'Q' ));
    return 0;
}
```

Exercise 3:

- Translate the algorithm for exercise 3 of TD in C.
Add the instruction that displays the result.

```
#include <stdio.h>
int A, B;
int main(){
    A=7;
    B=A-4;
    A=A-1;
    B=A+5;
    printf("A=%d\tB=%d\n" ,A, B);
    return 0;
}
```