



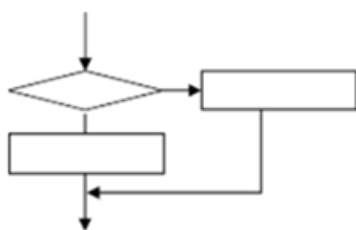
Tutorial N° 03: Conditional Instructions

Exercise 01:

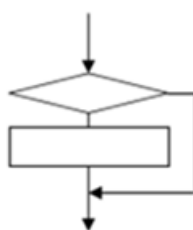
- 1) In algorithmic, what will be the condition: **Either $-1 \leq n \leq 2$, either $n=5$**
 - if $n \geq -1$ OR $n \leq 2$ AND $n = 5$ then
 - if $(n \geq -1$ OR $n \leq 2)$ AND $n = 5$ then
 - if $n \geq -1$ AND $n \leq 2$ OR $n = 5$ then
 - if $n \geq -1$ OR $n \leq 2$ OR $n = 5$ then
- 2) Give the conditional expression in algorithmic and in C language for each of the following expressions:
 - a) $5 < 8 < 10$
 - b) Either $x > 0$ or $x < -4$
 - c) $18 < \text{temperature} \leq 26$
 - d) Either $m = 10$ or $20 > n \geq 15$
- 3) What is the result of the expression written in C program?
 $(a \leq b/2) \parallel (a == 2) \&\& (b > 3)$
 In the case where « $a=3$ and $b = 8$ » and in the case where « $a=2$ and $b = 8$ »
 - Case 1: True, Case 2 : True
 - Case 1: False, Case 2 : True
 - Case 1: True, Case 2 : False

Exercise 02 :

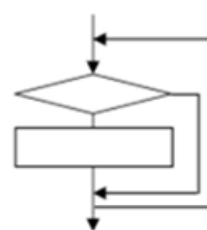
What is the most appropriate flowchart for this conditional statement?
if (n >=0) then write (“positive”); else write (“negative”);



(1)



(2)



(3)

Exercise 03 :

Write an algorithm that displays the maximum of two entered numbers.

Exercise 04:

Draw a flowchart and write an algorithm that ask the user for two numbers m and n and inform him whether their product is zero or positive or negative.

Exercise 05 :

Write a program that checks whether a number is divisible by 2 and 5 or not, using if-else instruction. After that, you transform it into a program C.

Exercise 06 : Write an algorithm that asks you for the current time and displays the time after one second later. For example, if the user types 21, then 32, then 8, the algorithm should respond: "In one second it will be 21 hour(s), 32 minute(s), and 9 second(s)."

Obviously, the user must enter a valid date.

Exercise 07 :

Consider the following C program. Give its equivalent C program using if-else instruction.

```
#include <stdio.h>
main() {
char c; printf("give your marital status"); scanf("%c",&c);
switch (c) {
case 's':
case 'S':
printf("single"); break;
case 'm':
case 'M':
printf("married"); break;
case 'd':
case 'D':
printf("divorced"); break;
case 'w':
case 'W':
printf("widowed"); break;
default:
printf("This marital status does not exist"); }
}
```

Additional Exercises

Exercise 08 :

Write an algorithm that tests the parity of an integer, that's to say, it displays whether an integer entered on the keyboard is even or odd.

Exercise 09 :

Write an algorithm that displays whether a student is admitted or failed, given that its average grade must be between 0 and 20. You have to display that the average grade is incorrect if it is less than 0 or greater than 20.

Exercise 10 :

A reprography store charges 5 Algerian Dinar for the first 10 photocopies, 4 AD for the next 20 and 3 AD beyond that. Write an algorithm that asks the user the number of photocopies made and displays the corresponding invoice.

Exercise 11 :

Write an algorithm that requests a real number from the user and displays its absolute value (without using the predefined function).

Exercise 12 :

Give the algorithm which allows you to enter a number and display the day of the week, for example 7 represents Friday.

Exercise 13 :

Same as exercise 11. The same goes for months, for example 1 represents January.

Methodology of solution

Exercise 01 :

4) In algorithmics, what will be the condition: **Either $-1 \leq n \leq 2$, either $n=5$**

- if $n \geq -1$ OR $n \leq 2$ AND $n = 5$ then
- if $(n \geq -1$ OR $n \leq 2)$ AND $n = 5$ then
- if $n \geq -1$ AND $n \leq 2$ OR $n = 5$ then
- if $n \geq -1$ OR $n \leq 2$ OR $n = 5$ then

5) Give the conditional expression in algorithmics and in C language for each of the following expressions:

- e) $5 < x < 10$: **Algo:**if $((x > 5)$ and $(x < 10))$ then, **C:**if $((x > 5) \&\& (x < 10))$ {
- f) Either $x > 0$ or $x < -4$, **Algo** if $((x > 0)$ or $(x < -4))$ then , **C:** if $((x > 0) \parallel (x < -4))$
- g) $18 < \text{temperature} \leq 26$ **Algo:** if $((\text{temperature} > 18)$ and $(\text{temperature} \leq 26))$ then
- h) Either $m=10$ or $20 > n \geq 15$ **ALGO:**if $((m=10)$ or $((n \geq 15)$ and $(n < 20))$) then

6) What is the result of the expression written in C program:

$(a \leq b/2) \parallel (a == 2) \&\& (b > 3)$

In the case where « $a=3$ and $b = 8$ » and in the case where « $a=2$ and $b = 8$ »

Case 1: True, Case 2 : True

- Case 1: False, Case 2 : True
- Case 1: True, Case 2 : False .

Exercise 04:

Draw a flowchart and write an algorithm that ask the user for two numbers m and n and inform him whether their product is zero or positive or negative.

Solution :

Algorithm product

Var m, n : integer;

Begin

Write (“give two numbers \n”);

Read(m,n);

If $((n > 0)$ and $(m > 0))$ or $((n < 0)$ and $(m < 0))$) **then**

Write (“the product is positive\n”);

Else

If $((n > 0)$ and $(m < 0))$ or $((n < 0)$ and $(m > 0))$) **then**

Write (“the product is negative\n”);

Else

Write (“the product is zero\n”);

endif

endif

End

#include <stdio.h>

int main()

{ int m,n;

printf("give two integer numbers \n");

scanf("%d%d",&m,&n);

if $((n == 0) \parallel (m == 0))$

printf (" the product is zero\n");

else

{

if $((n > 0) \&\& (m > 0)) \parallel ((m < 0) \&\& (n < 0))$

printf (" the product is positive \n");

else

printf ("the product is negative \n");

}

return 0 ;}

Exercise 6 :

```

#include <stdio.h>
main()
{ int h, m,s;
printf("give the current time please enter hour then minutes then secondes \n");
scanf("%d%d%d",&h,&m,&s);
if (((h<0)||(h>=24))||((m<0)||(m>=60))||((s<0)||(s>=60)))
    printf("it is incorrect value \n");
else
{ s=s+1;
  if (s > 59)
  {
    s=0;
    m=m+1;
    if (m > 59)
    {
      m=0;
      h=h+1;
      if (h>23)
        h=0;
    }
  }
  printf("the time will be in one second %d hour %d minutes and %d second \n",h,m,s);
}
}

```

Algorithm ex15

Var y : integer ;

b : boolean ;

begin

write ("this program test if the year is leap or not \n") ;

write ("enter a year number ") ;

read (y) ;

b ← ((a mod 400 = 0) or ((a mod 4 = 0) and (a mod 100 ≠ 0))) ;

if (b = 1) **then**

write (y, "is a leap year.") ;

else

write (y, "is not a leap year.") ;

endif ;

end.