TUTORIAL N°1: SIMPLE SEQUENTIAL ALGORITHM

Exercise 01:

Indicate whether the following words can be used as identifier or values and give its type :

Xx25ab	2y	-0.5	1,8	lire	&	'5'	"vap"	'd"	0	'M'	'#'
alpha	25,3	14.5	-11	c/n	#ff	a*b	faux	y^2	g!	"R"	
Ajou5	+9	+10.6	"k=14.9"		"15"	vrai	Ahmed		gt-at	F_i	
xy<5	d^y	cinq	google.com		X_1	a_1	"-11,6"		'vap'	vap	
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Exercise 02:

Answer the following statements with “true” or “false” to (indicate errors):

1) Var S_1, S_2 : integer ;	2) Var S1, S2 : integer ;	3) Var S, S' : integer ;
4) Var A – B – C : integer ;	5) Var (A, B, C) : integer ;	6) Var A, B, c : integer ;
7) Var NomEtudiant : string;	8) Var nom étudiant: string;	9) Var nom_etudiant: string;
10) Var : R : real ;	11) Var R : float ;	12) Var R : real ; Var N : integer ;

Exercise 03:

Propose a declaration for each of the following variables:

- Student’ last name
- State of a switch
- Examination score
- Wilaya of Algeria
- Student number
- Roots of a 2nd degree equation
- Status of a student
- Number of available units of a product

Exercise 04: Given integer variables a, b, c, d and e, evaluate the following expressions:

a = 1, b = 2, c = 3, d = 4,	
• a + b - c + d • a * b/c+d • a * b MOD c	• a+d %b - c • ++a * b - c-- • ++b / c + a * d++
a = 8,b =15,c = 4,	a = 9,b =12,c = 3,
• 2*((a MOD 5)*(4+(b-3)/(c+2)))	• a- ((b/(3+c)) *2) -1
a = 11,b = 6,c = 0,d = 7,e = 5	a=1; b=2; c=4; d=6
• a+2 > b AND NOT c || a <> d AND a-2<=e	• a+b/c*((d/3+4)/3+a)/b ; • (a>b) OR NOT (c>=d) AND (b<c) ;

Exercise 05: The variables N, P and Q are integers and contain the values 5, 7 and 3 respectively. Are the following expressions correct? If so, give their type and value.

- N mod P * Q
- N mod P div Q
- N = P ou N <= Q
- P div N < Q

Exercise 06 : Evaluate the following logical expressions with (a,b,c,d) = (2,3,5,10) and (X,Y) = (True, False)

1) $(a < b) \wedge (a < c)$	2) $\neg((a < b) \wedge (a < c))$	3) $\neg (a < b) \wedge (a < c)$
4) $(a < b) \wedge (c = d/2)$	5) $(d / a = c) = Y$	6) $(d / c = b) = Y$
7) $(d / c = b) = X$	8) $(a < b) \wedge (d < c)$	9) $(a < b) \wedge (d < c) = X$

Exercise 07: Respond with "true" or "false" to each read or write operation (indicate errors):

1) Read (A)	2) Read (45)	3) Read (A+B)
4) Read ("A")	5) Read ("A = ", A)	6) Write (X + 2*Y)
7) Write ("A = ", A)	8) Write (A, " ", B)	9) Write (45)
10) Write (5 mod 7 div 2)	11) Write ("Give a number : ")	12) Write ("Root of " ,X," is ", SQRT(X))

Exercise 08 : What are the values of variables A, B, C in the following algorithms?:

```
Algorithm assign1
Var A,B : integer ;
Begin
  A ← 1 ;
  B ← A + 2 ;
  A ← 3 ;
End
```

```
Algorithm assign2
Var A,B,C : integer ;
Begin
  A ← 6 ;
  B ← 12 ;
  C ← B+2 ;
  A ← A-2 ;
  B ← C*2 ;
End
```

```
Algorithm assign3
Var A,B,C : integer ;
Begin
  A ← 7 ;
  B ← A+1 ;
  C ← B/2 ;
  C ← C-2 ;
  A ← B ;
End
```

```
Algorithm concat
Var A,B,C : string;
Begin
  A ←  "7" ;
  B ← A+ "a" ;
   C ← B+A ;
End
```

Exercise 09 : Write two algorithms that SWAP or switches the values of two integer A and B: first using an auxiliary variable and without an auxiliary variable for the second.

Exercise 10 : Write an algorithm that asks for a number from the user, then calculates and displays the square of this number.

Exercise 11 : Write an algorithm that inputs the price of an item (excluding tax), the number of items and the VAT rate. The algorithm then provides the total price including tax. (Make sure the labels appear clearly)

Exercise 12 : Write an algorithm that allows you to calculate the determinant of a quadratic equation:

$ax^2 + bx + c$.

Exercise 13 : Write an algorithm that calculates and displays the area of a rectangle, where the width and height will be given by the user.