REPUBLIQUE ALGERIENNE DEMOCRATIQUE ET POPULAIRE
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Level: 1st year computer science
Material: ADS2
Note Use dynamic arrays

TD/TP Series No.: 03

Chapter 1 : Pointers

Exercise 1: (TD)

Complete the following table that shows the value of each variable after each statement.

instruction	a	b	c	p1	p2	instruction	a	b	c	p1	p2
`int a, b, c,*p1,*p2;`	/					`++*p2;`					
`a=1; b=2; c=3;`		2				`*p1*=*p2;`					
`p1=&a; p2=&c;`				&a		`a=++*p2**p1;`					
`*p1=(*p2)++;`						`p1=&a;`					
`p1=p2; p2=&b;`						`*p2=*p1/=*p2;`					
`*p1-=*p2;`											

Exercise 2: (TP)

Write a program that fills an array 'A' with real numbers, then creates two arrays 'Pos' and 'Neg', and puts all the positive numbers in 'Pos' and all the negative numbers in 'Neg', and leaves the null numbers as they are.

Exercise 3: (TD)

Let ***p*** be a pointer pointing to array T:

```
int T[] = {8, 17, 7, 9, 48, 76, 22, 27};   int *p =T;
```

What is the value or address returned by each of the following expressions:

1. `*p+3`		2. `p+(*p-7)`		3. `&T[5]-p`	
4. `&p+1`		5. `*(p+3)`		6. `*(P+*(P+7) - T[6])`	
7. `T+2`		8. `&T[5]-2`		9.	

Exercise 4: (TD/TP)

Write the ***strcat*** function, which concatenates two strings into a new string. (use the * dereferencing operator instead of []).

Exercise 5: (TP)

Write the ***copy*** function that copies part of an array. The function takes the array and its size , start, and copied size, and returns a pointer to the new array.

Exercise 6 : (TD/TP)

Suppose we have a black and white image with dimensions n×m, stored as a matrix of integers. Write a function named "flip" that vertically flips the image.

Exercise 7: (TD)

Write the ***Mat2Tab*** function that converts a matrix into an array.

Exercise 8 : TD/TP

Define a structure to store the time (hour, minute). Then, define a structure to store the TV program of a channel (program name, program time, and duration in minutes).

Write a program that populates an array of "N" TV programs. Then, it asks the user for a time to display the current program airing at that time

Exercise 9 : (at home)

- Write the **lowerMat** function, which allocates memory for only the bottom half of a matrix.
- Write the **Tab2Mat** function that converts an array into a matrix.
- Write the **strContains** function that takes two strings and determines whether the first one contains the second string or not.