

Lebanese University
Faculty of Science
Section I

BS - Computer Science
2018-2019

I2206 - INFO 205

Data Structures

LS 2 : Recursive functions

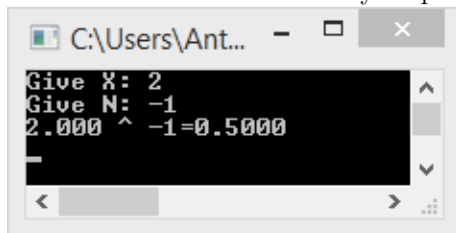
ATTENTION!

You should upload your solution at the latest by Saturday, February 23, 2019 11 p.m. via the web page of the course on www.antoun.me.

Exercise 1 Write a recursive function that calculates X^N where X is a float and N is an integer.

Prototype : `float power(float X, int N)`

Write a *main* function to test your program.

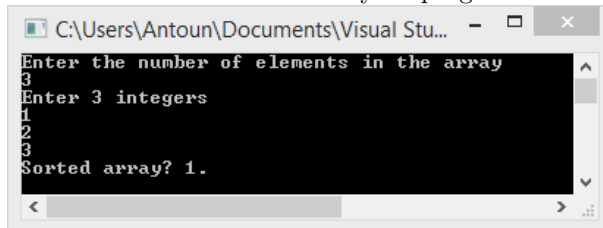


```
C:\Users\Ant... - [X]
Give X: 2
Give N: -1
2.000 ^ -1=0.5000
```

Exercise 2 Write a recursive function that checks whether an array is sorted.

Prototype : `int is_sorted(int tab[], int N)`

Write a *main* function to test your program.

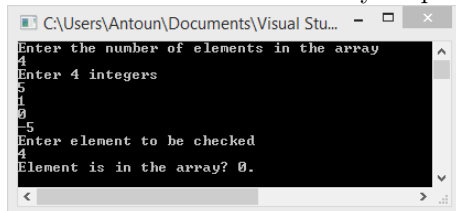


```
C:\Users\Antoun\Documents\Visual Stu... - [X]
Enter the number of elements in the array
3
Enter 3 integers
1
2
3
Sorted array? 1.
```

Exercise 3 Write a recursive function testing whether a specific element is in an array.

Prototype : `int in_array(int tab[], int N, int element)`

Write a *main* function to test your program.

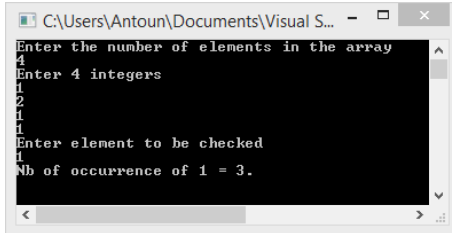


```
C:\Users\Antoun\Documents\Visual Stu... - [X]
Enter the number of elements in the array
4
Enter 4 integers
5
1
0
-5
Enter element to be checked
4
Element is in the array? 0.
```

Exercise 4 Write a recursive function that returns the number of occurrences of an element in an array.

Prototype : `int nb_occurrence(int tab[], int N, int value)`

Write a *main* function to test your program.

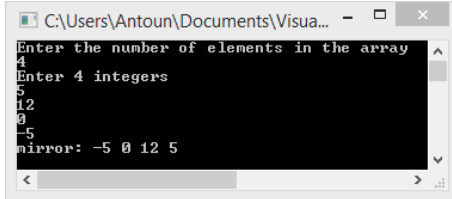


```
C:\Users\Antoun\Documents\Visual S... - □ ×
Enter the number of elements in the array
4
Enter 4 integers
1
2
1
1
Enter element to be checked
1
Nb of occurrence of 1 = 3.
```

Exercise 5 Write a recursive function that mirrors the elements in an array.

Prototype : `void mirror(int tab[], int start, int end)`

Write a *main* function to test your program.

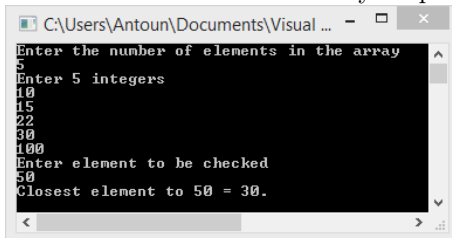


```
C:\Users\Antoun\Documents\Visua... - □ ×
Enter the number of elements in the array
4
Enter 4 integers
5
12
0
-5
mirror: -5 0 12 5
```

Exercise 6 Write a recursive function that, given an integer X , determines the position of the closest value of X in an array.

Prototype : `int closest(int tab[], int N, int X, int position)`

Write a *main* function to test your program.



```
C:\Users\Antoun\Documents\Visual ... - □ ×
Enter the number of elements in the array
5
Enter 5 integers
10
15
22
30
100
Enter element to be checked
50
Closest element to 50 = 30.
```