Data structures

Practical lab 5 – Array and Recursive

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If a programmer codes just for fun he has all his skill.

If he codes for score his hand tremble and his breath is uneasy

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Submit your project via moodle

- First submission at the end of the session

- Second submission on 7th April 2017, before 12am

Create a new project in NeatBeans and name it PraticalLab5.

Exercise 1. Array

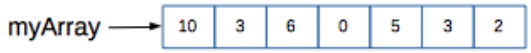
Q1. Create a method called viewReverse allowing to print out all the elements of array in reverse order.

```
public static void viewReverse(int[] myArray){

        //your code here
}
```

Test your method!

Example:



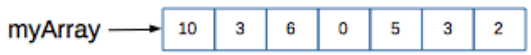
expected result: 2, 3, 5, 0, 6, 3, 10

Q2. Create a method called getMaxValue allowing to return maximum value in the given array.

```
public static int getMaxValue(int[] myArray){

        //your code here
}
```

Example:



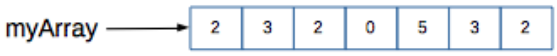
expected result: max value is 10

Q3. Create a method called getDuplicateElements allowing to print out the duplicate value(s) in an array.

```
public static int getDuplicateElements(int[] myArray){

        //your code here
}
```

Example:



expected result: 2, 2, 3, 2

Exercise 2. Loop and recursive

Q4. In mathematics, the factorial of a non-negative integer n, denoted by n!, is the product of all positive integers less than or equal to n. For example, 5! = 1 x 2 x 3 x 4 x 5 = 120.

Create a static method and name it factorial. This method returns factorial of n.
Note: use for loop

```
public static void factorial(int n) {
        //your code here
}
```

Test your method!

Q5. Calculate factorial of n, by using recursive method

```
public static void factorialRecursive(int n) {
        //your code here
}
```

Test your method!

Q6. In mathematics, the Fibonacci numbers are the numbers in the following integer sequence, called the Fibonacci sequence, and characterized by the fact that every number after the first two is the sum of the two preceding ones.

In mathematical terms, the sequence F(n) of Fibonacci numbers is defined by the recurrence relation:

$F(n) = F(n-1) + F(n-2)$

Where

$F(1) = 1$ *and* $F(0) = 0$

Create a static method fibonacci. Implement the fibonacci algorithm

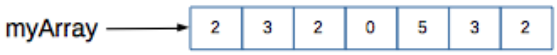
```
public static int fibonacci(int n) {
        //your code here
}
```

Q7. Write a recursive method called sumRecursive that return the total value in the given array

```
public static int sumRecursive(int[] myArray, index){

        //your code here
}
```

Example:



Expected result: total value is: 17

References:

http://www.toves.org/books/java/ch17-recur/index.html
http://www.toves.org/books/java/ch18-recurex/index.html
https://www.tutorialspoint.com/java/java_arrays.htm