Lab Work JAVA 2

Eeng3

This lab is still part of the JAVA discovery lab cycle, so you don't need to hand in your work at the end of the session.

Do not hesitate to watch the old videos and the documents present on the repository, they contain a great deal of information.

You will realize a project composed of four classes:

- The main class
- A class PartOne containing the methods of exercises in Part 1.
- A PartTwo class containing the methods of Part 2
- A PartThree class containing the methods of Part 3

You will have to interact with the user during some parts of the lab, you can find out how to use the Keyboard.java class in the video of the last tp.

Part 1 :

Write a method that displays the nearest integer k less than n that has exactly the same number of divisors as n. If none exists, the method displays text.

For example for n = 80 the answer is 48
For example for n = 48 no solution

Part 2 :

Write a method that creates an array of integers, fills it with random numbers, and returns it. The size of the array will be passed as a parameter.
Tip: Use one of those methods (How to generate random numbers in Java (educative.io))

Write a method that displays an array.

Write an algorithm that finds and returns the position in an array of a value passed as a parameter.

Write and then code in Java a method that returns true if no prime number is present in an array passed as a parameter.

Part 3 :

Consider the following game (loosely derived from darts games):

The machine rolls two dice, the player can choose to subtract from his capital the value of one of the two dice or of both dice.

In practice, the player enters on the keyboard the value of one of the two dice, or the sum of the two or -1 to immediately quit the game.

The initial capital is 30. If the capital reaches exactly 0, the player wins. If the capital is less than 0 we start again at 30.

Version A: 1 player.
Write a method for a player to play.

Example:

```
Player 1, your capital is 7. Draw: 5 and 4. What amount do you choose?
5
Player 1, your capital is 2. Draw: 6 and 4. What amount do you choose?
6
Player 1, your capital is 30. Draw: 1 and 5. What amount do you choose?
6
Player 1, your capital is 24. Draw: 2 and 6. What amount do you choose?
-1
Goodbye
```

For simplicity, you can ignore user errors (don't control inputs from user).

Version B: 2 players

Without using the previous method (creating another method will let you keep your first method as it is), write a method allowing two players to play alternately. The first of the two players who gets to exactly 0 wins.

A little bit more ?

You can add some control on the Part3 (is the player really using one of the ramdom numbers givent to him ?).

Write a method that calculates and displays the factorials of the numbers 1, 2, 3, ..., n, with n passed in parameter. What happens when n becomes big?

Write a method that displays in the console an isosceles right triangle (with stars or a chosen caracter) whose length of sides will be passed in parameter.