

## Lab #4 - Week 5 - Static Methods and Random Numbers

In this lab, we will explore writing static methods and how to generate random numbers.

Lab setup:

- Create a project named Week5LastnameFirstname
  - Create appropriately named packages for your classes
1. **(50 points)** The *cumulative sum* of positive integer  $n$  is defined as the sum of the first  $n$  positive integers. For example, the cumulative sum of 5 is given by the sum:

$$\text{cumulative}(5) = 1 + 2 + 3 + 4 + 5$$

Write a public static method `cumulative` that takes an integer number as the input and returns its cumulative sum value.

Use the following method prototype, where `number` is the input integer:

```
public static int cumulative( int number )
```

2. **(50 points)** Write a GUI program, with `JPanel` and `JFrame` classes, to simulate a random game of darts (pikado). Define and draw a target circle on the panel with the circle diameter equal to the half of the panel width.

Now use the `java.util.Random` class to generate 10 uniformly random points on the panel, each representing a dart hit. Draw each hit on the panel with a small filled circle. Count the number of hits inside the circle and write out this number to the console or on the panel using the string "Score:  $n / 10$ ", where  $n$  is the number of circle hits.