Ex.1. The simple class definition, creating objects

a) Create the new project (*New/Project -> Java Application*) entitled **Lab2** (Listing 1);

b) In the package **lab2** create a new file Rectangle with **Rectangle** class definition (see firg 1. and the listing 2);

c) In the main method of the **Lab2.java** create two rectangle objects and show all information about them (Listing 3).

d) Run the main project.

Listing 1. Lab2.java

```
package lab2;

public class Lab2 {

    public static void main(String[] args) {
        // TODO code application logic here
    }
}
```

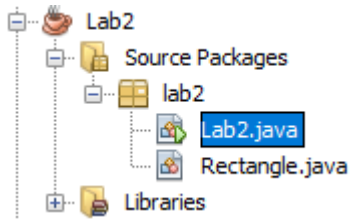

Fig. 1. Files in the Lab2 project

Listing 2. Rectangle.java

```
class Rectangle{
  //private fields:
  private int width;     //field
  private int height;    //field
  private String name;   //field
  //public constructor with parameters:
  public Rectangle(int width, int height, String name) {
        this.width = width;
        this.height = height;
        this.name = name;
    }
  //public constructor without parameters:
  public Rectangle() {
        this.width = 1;
        this.height = 1;
        this.name = "Rectangle ";
    }
  //other public methods:
  public int getHeight() {
        return height;
    }
  // add definition of getName() method
  // add definition of getWidth() method
  //adddefinition of calculateArea() method
  //add definition of calculatePerimeter() method

  public String showInfo()
    {   String result;
        result=getName()+", size:"+width+","+height;
        result+=", field:"+calculateArea()+ ",... " ;
        return result;
    }
}
```

Listing 3. Additional instructions in the main method of Lab2 class

```
public class Lab2 {

     //test the Rectangle class in main method:
    public static void main(String[] args) {
         //create the objects rec1 and rec2:
        Rectangle rec1=new Rectangle(10,20,"Rectangle 1");
        Rectangle rec2=new Rectangle();

         //show information about the objects
         //using methods of the Rectangle class:
        System.out.println("Width and height "+rec1.getName() + ":"+
                           rec1.getWidth()+","+rec1.getHeight());
        System.out.println(rec1.showInfo());
       //show the same about rec2 ...
    }
}
```

e) In main method add definition of other rectangle objects:
- entitled “My rectangle 3” , width=100 and height=100
- entitled “Other rectangle 4”, width=200 and height=50

and display the informations about them ().

Ex.2. The Student classes definition

In the **Lab2** project define `Student` class with:
- fields: `name`, `age`, `faculty`, `examGrades (array of double)`
- constructors (with arguments and no-arguments)
- methods `getAge`, `getFaculty`, `getName`, `getGrades`, `showStudentInfo`

a) test your class in the main method (create 3 different students and display information about them).

b) Define a `calculateAverage` method and test it for all three students created in the a).