Lab 06: Creating Objects

Objective

This lab will provide practice in creating objects and calling methods and constructors.

Overview

In this lab you will:

- Create a test class
- Instantiate several objects using constructors
- Utilize get and set methods
- Utilize other business methods
- Fine tune the behavior of the **Box** Class

Step by Step Instructions

Exercise 1: Creating Objects

1. Create a new class named **BoxDriver** in the **com.lq.exercises** package. Ensure that this class has a `main()` method defined.

2. In the main method of **BoxDriver**, create two **Box** objects using the keyword `new`.
   a. A box named **box1** with a length of 5, a width of 6 and a height of 7
   b. A box named **box2** where all three sides are 10

3. Using the get methods, print out the value for each attribute of both boxes. Ensure that the attributes were set correctly by the **Box** constructors. Execute the main method for **BoxDriver**. The output should be like the following. If there are any errors in your **Box** code at this point, correct them and re-run the test.

```
Box 1 length is + 5.0
Box 1 width is + 6.0
Box 1 height is + 7.0
Box 2 length is + 10.0
Box 2 width is + 10.0
Box 2 height is + 10.0
```

Exercise 2: Test Business Methods

4. Ensure that your set methods work correctly. Call each set method for `box1` changing the values to the following and then use the get methods to ensure that the attributes were set correctly.
    a. Length = 3
    b. Width = 4
    c. Height = 5

5. Call the `getVolume()` and `getSurfaceArea()` methods on `box1` and ensure they are functioning correctly. If not, fix the code and re-test.

6. Execute the `printBox()` for `box1`. Ensure that it is functioning correctly. If not, fix the code and re-test.

7. Using the `setLength()` method, change the length of `box1` to -5. Execute the `printBox()` method again. What happens? You should receive a message stating that the box contains invalid attributes.

8. In order to avoid setting attributes to invalid values, re-code the set methods of the **Box** class to only accept values greater than 0. If a value less than or equal to zero is detected, print an error message like the following:

```
System.out.println("Length must be greater than 0");
```

9. Re-run your **BoxDriver** main method. You should now receive an error message when you try and set the **length** to -5. Test the other two set methods in the same manner.

Challenge Exercise

10. Change the **Box** constructors so that new boxes can only be created with valid attributes. If a constructor detects an invalid parameter, use a default value of 1 (one).