

Java Lab 5

In this lab, you will practice with classes.

1. Create a project named Lab5. For each class specification listed in the problems 2-5, create the class in the src folder. In addition to any other methods mentioned below, each class should have the following methods (feel free to use IntelliJ to auto-generate these, see Code->Generate):

- default constructor
- one overloaded constructor for all the member data
- getters and setters for all member data
- a toString() method. This should return a formatted string containing the member data with labels, such as "minimum: " + minimum, for the minimum data field in Sensor.

2. Class Sensor. Data: minimum, maximum, currentValue, interval – double; location, type – String; id – int. Methods: boolean trip(). This method returns true if the currentValue is less than minimum or greater than maximum and returns false otherwise.

3. Class Device. Data: type, location – String; id – int. Methods: void actuate(). This method prints the formatted data (that is, it prints toString()) in ALL CAPS.

4. Class Room. Data: length, width– double; name – String; id – int. Methods: double getArea(). This method computes and returns the room's area.

5. Class Alarm. Data: message – String; id -int. Methods: void soundTheAlarm() – displays the message and simulates a 911 call.

6. Create a class called Lab5; in it, create a main method the does the following:

- create a Sensor object named temperature with data (in the order listed above): 0.0, 120.0, 68.0, 1.0, kitchen, temperature, id 1.
- create a Device object named extinguisher with data fire extinguisher, kitchen, 1.
- create a Room object named kitchen with data 12.0, 15.0, kitchen, 1.
- create an Alarm object named bell with data "Ding! Ding!", 1.
- display all the objects by printing their toString() .

7. Continue with main:

Display a welcome message. Display the Room information (yes, again).

Create a loop that asks the user if they want to enter a new value, Y or N; loop until they enter N. In the loop, show the current kitchen temperature and prompt the user enter a new temperature; use it to reset the temperature object's currentValue, then see if that tripped the sensor – if it did, actuate the extinguisher, then sound the alarm; then reset the kitchen temperature back to what it was.

8. There are four related classes. How should they be organized? And how should they communicate with each other? Write your answer as a comment at the end of main(); include in it: (a.) why you decided on this organization, and (b.) how the communication in main's loop would occur – which object/method would main call, then which object/method would that call, to get all the same work done.

Deliverable: Add your name and Andrew id to the comment at the top of the Lab5 class file. Zip all the .java files and upload it to Canvas.