National University of Sciences and Technology (NUST)
School of Electrical Engineering and Computer Science

Department of Computing

CS 212: Object Oriented Programming

Class: BESE-7AB

Lab 06: Object-Oriented Modeling of Real-World Problems

Date: April 07, 2017

Instructor:

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Learning Objectives

The learning objective of this lab is to be able to model real-world scenarios in the perspective of object-oriented modeling techniques.

Task #1:

A security system consists of several sensors, lights and an alarm. Sensors can be of different types like smoke sensor, sound sensor, motion sensor, etc. Each sensor has some things in common like sensor number, on/off state, is it working correctly, its date of installation, where it is installed, etc. Similarly, common functionality of sensors may include switching on and off, resetting, etc. Each sensor should 'detect' or 'sense' something but they all will do it differently. Every sensor also has its unique methods like smoke sensor has call fire brigade facility. Motion detector can automatically lock external doors. Sound detector analyzes the sound and takes intelligent decisions like calling the police. Information from different sensors makes the system to sound the 'Alarm' and switch on/off different lights depending on the situation.

Apply object oriented concepts you have learnt so far to design the system described above. There are hints about what should be the super and sub classes. Try to think of as many classes as you can. Write a main method to test the working of your security system. Remember that functionality is not the focus of this assignment, more weightage will be of how you structure your classes. Nevertheless, a minimal working implementation is expected!

Hand in

Hand in the source code from this lab at the appropriate location on the LMS system. You should hand in a single compressed/archived file named Lab_6_<Your CMS_ID. Your_NAME >.zip (without angle brackets) that contains ONLY the following files.

1. A word document containing the class diagrams for all the objects identified for this lab. The class diagram should show the relationship between classes as well as the instance variables and methods within these classes.

2. All completed java source files representing the work accomplished for this lab. The files should contain author in the comments at the top.

To Receive Credit

1. By showing up on time for lab, working on the lab solution, and staying to the end of the class period, only then you can receive full credit for the lab assignment.

2. Comment your program heavily. Intelligent comments and a clean, readable formatting of your code account for 20% of your grade.

3. The lab time is not intended as free time for working on your programming/other assignments. Only if you have completely solved the lab assignment, including all challenges, and have had your work checked off for completeness by your TA/Lab Engineer should you begin the programming/other assignments.