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

Subject: CS212 Object-Oriented Programming **Due Date:** Monday 17th April, 2017

Assignment # 03 (20 Points)
Group Assignment (2 Students/Group Max)

[CLO2] - Demonstrate the ability to create and use OOP constructs to map real world scenarios.

Note: You will upload your submission on LMS through the submission link (a single Zip file) and submit a hand-written copy during the class. Printed Assignments will get a penalty.

Question#1: A security system consists of several sensors including control panel, sensors, lights and an alarm. Sensors can be of different types like smoke sensor, sound sensor, motion sensor, door sensor etc. Each sensor has some properties in common like the sensor number, its 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 has to '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 function to test the working of you security system. Remember that functionality is not the main focus of this assignment, more weightage will be of how you structure you classes. Nevertheless, a minimal working implementation is expected!