**CENG 451**

**Project 1: Requirements Model in UML**

**Elevator Control Software**

**DEADLINE:** 12/1/2017 (Friday during final exams): Turn in on paper (hardcopy) as well as soft copy as a document that includes UML diagrams in it. You can use starUML that is a free tool and you can print / export diagrams or copy from it to be included in your report document. Also turn in the model files (for example, starUML model).

Only one report per group.
Submit to both the assistant Hilal Kılıç Arslan (or upload for the course pages in the internet) AND me (dogru@ceng.metu.edu.tr). One hardcopy to either of us.

The project is about modeling the elevator control system as in the ‘problem space’ (requirements). The software will be easily adaptable to different kinds of elevator applications: your model should assume different numbers of elevator cars, and different numbers of floors. You can model a specific number of them (Number of cars >= 2, number of floors >= 4 for specific diagrams where specified numbers will make them better to understand) however, in general your model should not be limited to those numbers.

There will be status displays at every floor, about the current floor and direction (up/down) for every car, and call buttons for going up or down (not both at the highest and the lowest floors).

Inside the cars, a display will show the current floor, selected direction, and destination floors. Also a set of buttons will be used to select (also deselect !) the requested destination floors.

Some operational algorithms for the understanding of the system are listed below. You are not responsible for the design of those algorithms. Maybe, you can allocate them in some classes and send messages for accomplishing them:

1. A car will prefer to continue its direction until the last requested floor, before it changes direction for the requests that are in the other direction. Every request (through pushed internal button, or centrally assigned because of call buttons at the floors) will be evaluated, if accepted will be added to the display.

2. A call button at any floor will invoke an algorithm to select the car to be assigned to this request. This algorithm will consider all the cars, their sets of requested floors and their directions. The closest car (close to the floor where call is made) with the correct direction (it is moving towards the call floor) will be assigned, its display will now include the new floor to stop.

3. A request (from inside a car to add a new destination floor, or a call request from outside – (the floors)) can be assigned to a car if it is at least at a safe distance that it can stop at that floor.

4. For some time of inactivity, the cars will be waiting at a set of different floors, that will minimize/optimize the next movement: a request can come from a floor that is statistically more likely for the given time of the day. For example, one can be in the middle floor, one or two at the ground level etc.

Your project is to develop UML models for the Project that is described below. The models should include:

1. Use Case Diagram(s)
2. Class Diagram(s)
You do not have to model everything. Select the important parts of the problem: 3 sequence diagrams (3 scenarios) are sufficient. However, try to be complete with the Use Case and the Class diagrams.

Write your assumptions and definitions in the beginning of your report. Make sure to indicate clearly your pages/diagrams – what they are about.

First page should be cover page:

Term Project for CENG 451
Fall 2017

Requirements modeling of an Elevator Control System

Name1
Name2
Name3