**Assignment 2 (10 pts)**

**CLO2:** **Evaluate** complex programming problems using object-oriented principles analysing solutions for efficiency and scalability.

You are required to design the below two real-life applications first in the form of UML diagrams and then programmed in JAVA. Submit your solution as a pdf over LMS.

**a)** Design an application to model a hospital using object oriented design principles that you learned in this course. The main features of the hospital are as follows:

1. The hospital has a name, address, patients, and departments.
2. Each department has a name and a staff (team members).
3. The application should allow the users to add and remove patients from the hospital system.
4. The application should allow the users to add and remove team members from a specific department in the hospital.
5. A team member could be a doctor or a nurse.
6. Each team member has a name, ID, gender (male or female), and the date he/she joined the hospital.
7. All team members have a maximum working time of 12 hours.
8. Each doctor has a specialty and there are three types of doctors: interns, senior doctors, and surgeons.
9. Each intern has a senior doctor as his/her supervisor.
10. Each senior doctor and surgeon has a group of patients that he/she treats.
11. The application should allow all doctors to check the report of a specific patient.
12. The application should have a method that models that a doctor treats a patient. However, interns, senior doctors and surgeons treat patients in a different way; hence, they should have different implementations for this method
13. Each patient has a name, birth date, gender (male or female), date he/she was accepted to the hospital, a report that includes the diagnosis made by his doctor, the doctor treating him/her, and number of days he/she will stay in the hospital.
14. All data fields are to be encapsulated.

**b)** Design an application to model a cooking contest, which has a group of chefs participating in the contest, a date that represents the contest date, and a prize, which is a certain amount of money. The application should be designed as follows:

1. Each chef has an ID and a group of recipes with which he’s participating in the contest. There are two types of chefs: junior chefs and senior chefs. Each senior chef has a number of years that represent his cooking experience. All senior chefs can participate with a maximum of 3 recipes. Whereas junior chefs can participate with one recipe only. Each junior chef must be assigned a senior chef as a supervisor.

2. Each recipe has a name and a description of its ingredients and instructions

3. Both recipes and chefs can be rated (i.e. they are both ratable). Hence, your design should provide methods to rate chefs and recipes. However, note that senior chefs are rated in a different way from junior chefs. Moreover, it is not allowed to have any chef in the contest that is not specified to be junior or senior.

4. Your design should override the equals method of the Object class for both chefs and recipes.

5. Your design should allow the user to print the rate of all chefs and recipes in the contest.