CS310 2014 Summer Term 1 Midterm Study Questions

True/False

For each true/false question below provide a *brief* justification of your answer.

1. A sequence diagram models the static relationships between objects.

2. The type `UndergradStudent` is substitutable (under Liskov's Substitution Principle) for its supertype `Student`.

```
class Student{
   ...
   // @pre The student is eligible to register for Course c
   //
   public void addCourse(Course c) {...}
   …
}
class UndergradStudent extends Student{
   ...
   // @pre none
   //
   public void addCourse(Course c) {...} …
}
```

3. Agile lifecycles (e.g., Scrum or XP) result in faster project completion time than the waterfall lifecycle.

4. It is important for software development teams to estimate task durations so that they can work on the shortest duration tasks first.

5. It's more important to follow the open/closed principle once you've released an API for your software than before you've released an API.

6. Agile methods are different from the Spiral model because development is organised as iterations instead of one single implementation phase.

7. Coupling and cohesion are totally unrelated, and changing one won't help the other.

8. "As a mom, I want my daughter to be able to chat with her friends in a safe on-line application so she will leave me alone to watch Game of Thrones" is an excellent user story.

Multiple Choice

Choose the best answer(s) for each question and provide a brief justification for your answer(s).

1. Assume that the designs (a) and (b) to the
   right are two valid solutions to a particular
   problem. Which design is better?
   a. design (a) is better
   b. design (b) is better
   c. designs (a) and (b) are equally good
      designs
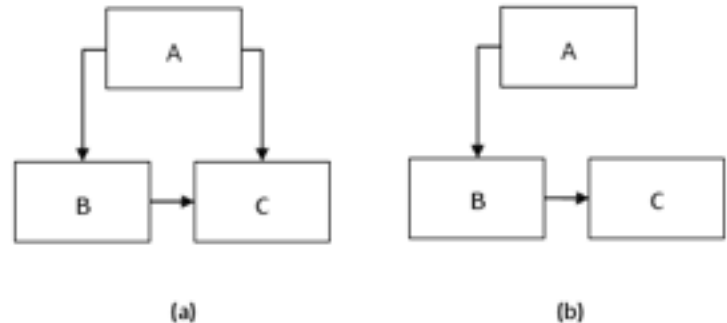
2. Circle <u>all</u> of the non-functional requirements below
   a. The server must have 99.9% uptime.
   b. The system must encrypt the password before authenticating over the network.
   c. The system must be usable on a mobile device.
   d. The server must be usable when being accessed by 100 users simultaneously.
   e. The user must be able to edit his/her profile.

Short Answer (expecting approx. 1/2 page writing per question)

1. Compare and contrast the approaches you would use to **elicit**, **specify** and **manage** requirements with
   Waterfall and Scrum. Explicitly state the similarities as well as the differences.

2. Draw a UML class diagram for the following situation. Make sure to include multiplicities and important
   methods and attributes. You may optionally give a *brief* explanation of your design if you think it would
   be useful. If you do provide an explanation, please focus on design decisions that you made rather than
   re-iterating information we can get from the diagram. Note any design patterns (discussed in class) you
   think would be helpful in achieving this design, and indicate which portions of the design are related to
   those patterns.

   You are creating a user interface that will display the contents of the filesystem. The filesystem
   contains folders and files, and each folder may contain other folders or files. When a change is made
   to the file system (e.g., new file or folder created, file or folder renamed, etc.) your user interface needs
   to update to reflect the change. Your user interface will be a window with a TreeViewer control. The
   TreeViewer control will display all of the files and folders.

3. Imagine that you are a technical team lead for a software development team. Your team is going to start
   a new project and you need to choose which lifecycle (Waterfall, Scrum or XP) your team will use.
   Which factors will you consider when making your choice? For each factor, explain why it's an
   important factor to consider.