Name: _____ ID: _____

Addis Ababa University
Institute of Technology
Information Technology and Scientific Computing

2016, First Semester Lisanu Tebikew

Final Exam
Feb 23, 2016
ITSE 2F12 Software Engineering

FINAL.README

1. This is a **closed book** exam. You may not use any reference materials during the exam; if you have any notes on you please put them away.
2. You have **2 hours** to complete as much of the exam as possible. Answer all questions directly on the space provided below each question. The weight of each question is indicated at the beginning of each question in parentheses. The total weight of the questions is 40 marks.
3. Make your answers as concise as possible.
4. You will receive partial credit for partially correct answers.
5. Write your **name on this cover sheet AND at the top of each page** of this booklet, since some pages might get *detached*.

Don't Begin The Exam Until You Are Told To Do So!
Good Luck!!

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Question 1. [5 points] Software Lifecycles

Name two alternative software lifecycle models. What are the advantages and disadvantages of each model when used to manage a software development project?

Question 2. [10 Points] – Usecases

Assume that you are hired to develop an automatic patient monitoring system for a home-bound patient. The system is required to read out the patient's heart rate and blood pressure and compare them against specified safe ranges. The system also has activity sensors to detect when the patient is exercising and adjust the safe ranges. In case an abnormality is detected, the system must alert a remote hospital.

Identify the actors and their goals. Briefly, in one sentence, describe each use case but do not elaborate them. Draw the use case diagram.

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Question 3. [10 Points] Class diagram

Draw a UML Class Diagram representing the following elements for a system that will be used to manage the Ethiopian premier league. The Ethiopian premier league is made up of at least ten football teams. Each team is composed of twenty players, and one player captains the team. A team has a name. Players have a number and a position. Football teams play games against each other in a game. Each game has a score and a location. Teams are sometimes lead by a coach. A coach has a level of accreditation and a number of years of experience. Coaches and players are people, and people have names and addresses.

Draw a class diagram for this information, and be sure to label all associations with appropriate multiplicities.

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Question 4. [10 Points] Sequence diagram

Draw a Sequence Diagram for the process of registering a new player for a football team. The system administrator is responsible to register new players. Assume that the administrator starts by seeing the list of football clubs registered in the league. When the administrator selects the football team to register the new player to, the system should accept player's details such as number, name, and age. The system checks the form is filled out correctly, and then registers the player and sends back an acknowledgement that the new player has been registered.

Don't forget to mark your objects as boundary, control, or entity.

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Question 4. [5 Points] State Diagrams

Draw a state diagram for the states that the patient in the patient monitoring system we described in Question #2 can be in. Assume that the patient start out in a safe state. The patient may go to unsafe state if his heart rate or blood pressure increases more than a certain level. Your state diagram needs to consider situations where the patient is exercising too.

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