WESTERN UNIVERSITY
FACULTY OF ENGINEERING
DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING

SE2203b –Software Design

Assignment 4

Due Date: March 31st , 2020

1 Overview

The analysis model represents the system under development from the user's point of view. The analysis model is consisting of the analysis object model and the dynamic model. The analysis object model focuses on the individual concepts that are manipulated by the system, their properties and their relationships. The analysis object model, for iCare has been developed during the activities in assignment2, where UML class diagram is used. The dynamic model focuses on the behavior of the system. The dynamic model is depicted with sequence diagrams and with state machines.

In this assignment, you will develop the dynamic analysis for iCare. This will involve composing UML sequence diagrams, listing and describing system operations. (You need to be familiar with the requirements in assignment 2 and 3, and Appendix1 as well).

2 Goals

At the end of this assignment, you should be able to:

- Verify an analysis class model.
- Draw sequence diagrams.
- Identify and describe operations.
- Build and draw a state model.

3 Assignment works

3.1 Realizing use cases

In order to simplify this assignment and make your life much easier, you will pick common use cases to realize. It's a good idea that all students start with the same use cases from iCare use case diagram and then work forwards through its flow of event. In this assignment we will build two sequence diagrams as follows:

1. The second sequence diagram to realize the use case "Assign Patient"
2. The third sequence diagram to realize the use case "Display My Board"

Please develop your works based on the sample solutions given for assignment2 and assignment3.

3.2 Question 1 - Draw a sequence diagram (assesses the PA4 CEAB indicator)

Use cases usually start with an actor telling a boundary object (a user interface) to do something or to retrieve some information. In such a case, you should draw the actor and the boundary with a line between

them indicating the beginning of the interaction. This line should be decorated by a message being sent to the boundary by the actor. Proceed through the use case step by step, inventing message flows between objects to satisfy the use case steps.

The following tips may help you draw the diagram:

- 1st column should be the actor who initiated the use case
- 2nd column should be a boundary object (that the actor used to initiate the use case).
- 3rd column should be the control object that manages the rest of the use case
- Create a control object at beginning of event flow
- The control object can be created by boundary objects initiating use cases
- The control objects create the other boundary objects
- Ensure that the involved entity objects are in your class diagram.
- Realize all entity objects included in the given class diagram.
- Use abbreviations for parameters (if any) and then use notes to spell out the abbreviations.
- Show the assignment of return values only when they are not obvious (you will provide more detail in the operation descriptions).
- Name values only when they are used elsewhere in the diagram (for example, if a return value is subsequently used as a parameter).

Add a new section in your workbook titled 'Potential iCARE Sequence Diagrams'. Develop the required two UML sequence diagrams, and add them in this section.

3.3 Question 2 – Detailing the operations (assesses the PA4 CEAB indicator)

1. Use the following table to list each class you realized in developing your sequence diagram in the previous step (actor, entities, boundaries and control), For each class, walk through your diagram and record every message sent to an object of that class as an operation. For each operation, add a short sentence or two describing what the operation does, what its parameters are for and what it returns (if anything). As you do this, be sure to show the types of the parameters and return values (if any). Occasionally, you won't know the types yet or you won't want to commit yourself until design – in such cases, just ignore the operation type in your description. Bear in mind that parameter and return types should match the attribute types you chose in the object analysis model.

Class name	Receiving message (operation)	Brief Description

3.4 Question 3 – Building a state model (assesses the PA3 CEAB indicator)

Think about what will happen when a doctor decides to assign a number of the existing patients at iCARE to him or herself. Assume that there is a rule in iCARE system saying that each patient can get a treatment by one doctor and at most three nurses, and a doctor cannot assign a patient to him/herself when

there is no nurse taking care of this patient. Based on this scenario, determine which object in iCARE will have significant state and then develop a UML Statechart diagram showing the possible states, events, and transitions of this object.

Add a new section in your workbook titled 'iCARE Statechart Diagram'. Add your UML Statechart diagram, and **provide a brief description of your diagram**.

4 Hand in

- By completing all the requirements in this assignment, make sure you updated the table of content then submit your workbook on OWL by the due date mentioned above.