Thursday, 9 December 2021

EAST WEST UNIVERSITY
Department of Computer Science & Engineering
B.Sc. in Computer Science and Engineering Program
MidTerm II Examination, Fall 2021 Semester

Course:	**CSE347 Information System Analysis and Design, Section-2**
Instructor:	**Md. Mohsin Uddin, Senior Lecturer, Department of CSE**
Total Marks:	**40 (20 will be counted for final grading)**
Time:	**1 Hour and 20 Minutes**

Note: There are **Four** questions, answer all of them. Course Outcome (CO), Cognitive Level and Marks of each question are mentioned at the right margin.

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1. Based on your analysis of the following system description, **construct** an appropriate use case diagram for the system. In your diagram use appropriate notations and symbols to illustrate Generalization, Included, and Extended use cases. [CO2,C4, Marks:10]

> “The SafeHome security function enables the homeowner to configure the security system when it is installed, monitors all sensors connected to the security system, and interacts with the homeowner through the Internet, a PC or a control panel. During installation, the SafeHome PC is used to program and configure the system. Each sensor is assigned a number and type, a master password is programmed for arming and disarming the system, and telephone number(s) are input for dialing when a sensor event occurs. When a sensor event is recognized, the software invokes an audible alarm attached to the system. After a delay time that is specified by the homeowner during system configuration activities, the software dials a telephone number of a monitoring service, provides information about the location, reporting the nature of the event that has been detected. The telephone number will be redialed every 20 seconds until telephone connection is obtained. The homeowner receives security information via a control panel, the PC, or a browser, collectively called an interface. The interface displays prompting messages and system status information on the control panel, the PC, or the browser window.”

2. Consider the following simplified description of a university where professors teach seminars in which students can enroll. **Construct** an appropriate class diagram. Add attributes and methods when necessary. You do not have to include getters and setters for attributes. In your diagram use appropriate notations, symbols, multiplicity to represent Generalization (class, abstract class/interface), Aggregation, Composition, and Association. [CO2,C4, Marks:10]

> "A professors has a name, address, phone number, email address, and salary. A student has also a name, etc., but no salary (sorry). A student, however, has an average mark (of the final marks of his or her seminars). A seminar has a name and a number. When a student is enrolled in a seminar, the marks for this enrollment are recorded and the current average as well as the final mark (if there is one) can be obtained from the enrollment. From a student one can obtain a list of seminars he or she is enrolled in. Professors teach seminars. Each seminar has at least one and at most three teachers. There are two types of seminar: bachelor and master. From a bachelor seminar students can not withdraw. From a master seminar they can."

3. Based on the following use case description, **Construct** a UML Sequence Diagram. [CO2,C4, Marks:10]

> "A deposit transaction asks the customer to choose a type of account to deposit to (e.g. checking) from a menu of possible accounts, and to type in a dollar amount on the keyboard. The transaction is initially sent to the bank to verify that the ATM can accept a deposit from this customer to this account. If the transaction is approved, the machine accepts an envelope from the customer containing cash and/or checks before it issues a receipt. Once the envelope has been received, a second message is sent to the bank, to confirm that the bank can credit the customer's account — contingent on manual verification of the deposit envelope contents by an operator later. (The receipt of an envelope is also recorded in the ATM's log.) A deposit transaction can be cancelled by the customer pressing the Cancel key any time prior to inserting the envelope containing the deposit. The transaction is automatically cancelled if the customer fails to insert the envelope containing the deposit within a reasonable period of time after being asked to do so."

4. Based on the following use case description, **Construct** a UML Activity Diagram. [CO2,C4, Marks:10]

"A session is started when a customer inserts an ATM card into the card reader slot of the machine. The ATM pulls the card into the machine and reads it (If the reader cannot read the card due to improper insertion or a damaged stripe, the card is ejected, an error screen is displayed, and the session is aborted). If the machine is able to read the card, then the customer is asked to enter his/her PIN which is sent to the bank (If the bank reports that the customer's PIN is invalid, the Invalid PIN extension will be performed, in which an attempt will be made to continue the session, where the customer will be asked to re-enter the PIN number. This is done 3 times. If the customer enters invalid PIN entries repeatedly, the session is aborted, the customer will not be offered the option of starting another session, and the card will be retained in the machine). If approved, the customer is then allowed to perform one or more transactions, choosing from a menu of possible types of transaction in each case. After the success/failure of each transaction, the customer is asked whether he/she would like to perform another. When the customer is through performing transactions, the card is ejected from the machine and the session ends. The customer may abort the session by pressing the Cancel key when entering a PIN or choosing a transaction type. "