



EAST WEST UNIVERSITY
Department of Computer Science & Engineering
B.Sc. in Computer Science and Engineering Program
MidTerm II Examination, Summer 2020 Semester

Course: CSE411 Software Engineering and Information System Design, Section-2
Instructor: Md. Mohsin Uddin, Lecturer, Department of CSE
Total Marks: 40 (15 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.

1. Based on your analysis of the following system description, **construct** an appropriate UML 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 department of public works for a large city has decided to develop a Web-based pothole tracking and repair system (PHTRS). Citizens can log onto a website and report the location and severity of potholes. As potholes are reported they are logged within a “public works department repair system” and are assigned an identifying number, stored by street address, size (on a scale of 1 to 10), location (middle, curb, etc.), district (determined from street address), and repair priority (determined from the size of the pothole). Work order data are associated with each pothole and include pothole location and size, repair crew identifying number, number of people on crew, equipment assigned, hours applied to repair, hole status (work in progress, repaired, temporary repair, not repaired), amount of filler material used, and cost of repair (computed from hours applied, number of people, material and equipment used). Finally, a damage file is created to hold information about reported damage due to the pothole and includes citizen’s name, address, phone number, type of damage, and dollar amount of damage. PHTRS is an online system; all queries are to be made interactively.”

2. Based on the simplified description of the system in Question 1, **construct** an appropriate UML 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]

3. 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.”

4. Based on the following use case description, **Construct** a UML Sequence Diagram (SD). [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.”