Attendance/Demo

To receive credit for this lab, you must make reasonable progress towards completing the exercises and submit individually the final result of your work on cuLearn. When you have finished the exercise, call your instructor or a TA, who will review your solution. For those who don't finish early, the TA will ask you to show whatever you have completed, starting at about 15 minutes before the end of the lab period. Finish any exercises that you don't complete on your own time.

Instructions

To better benefit from the work being asked, it is recommended to work in groups of two or three (not more). Your answer document should contain the names of all the group members.

Problem definition

A bank has several automated teller machines (ATMs), which are geographically distributed and connected via a wide area network to a central server. Each ATM machine has a card reader, a cash dispenser, a keyboard, a display, a deposit box, and a receipt printer. By using the ATM machine, a customer can withdraw cash from either a checking or savings account, query the balance of an account, transfer funds from one account to another, or deposit funds. A transaction is initiated when a customer inserts an ATM card into the card reader. Encoded in the chip on the card are the card number, the start date, and the expiration date. Assuming the card is recognized, the system validates the ATM card to determine that the expiration date has not passed, that the user-entered PIN (personal identification number) matches the PIN maintained by the system, and that the card is not lost or stolen. The customer is allowed three attempts to enter the correct PIN; the card is confiscated if the third attempt fails. Cards that have been reported lost or stolen are also confiscated.

If the PIN is validated satisfactorily, the customer is prompted with a withdrawal, query, transfer or deposit transaction. Before a withdrawal transaction can be approved, the system determines that the sufficient funds exist in the requested account, that the maximum daily limit will not be exceeded, and that there are sufficient funds at the local cash dispenser. If the transaction is approved, the requested amount of cash is dispensed, a receipt is printed containing information about the transaction, and the card is ejected. Before a transfer transaction can be approved, the system determines that the customer has at least two accounts and that there are sufficient funds in the account to be debited. For approved query or transfer requests, a receipt is printed and the card is ejected. For a deposit transaction, the customer is asked to put all its funds in a provided envelope, provide the amount of funds and the account where the funds needs to go (using the keyboard), and slip the envelop in the deposit box. A receipt is printed, mentioning the details of the deposit and the ATM also prints that information on the inserted envelope (the device accepting envelopes has a printer).

A customer may cancel a transaction at any time (though not after a withdrawal transaction has been approved, of after inserting an envelope); the transaction is terminated and the card is ejected. Customer records, account records, and debit card records are all maintained at the server.

An ATM operator may start and close down the ATM to replenish the ATM cash dispenser, and for routine maintenance. The ATM operator may also retrieve the deposit envelope, reconcile the information printed on the envelop and the funds inserted in the envelop and then use a computer at the branch to confirm the deposit transaction (the customer account is credited). It is assumed that functionality to open and close accounts and to create, update, and delete customers and debit card records is provided by the existing bank system and is not part of this (ATM) problem.

For security reason, the ATM is also equipped with a camera that takes pictures of every customer using the ATM: a picture is taken and time-stamped when the card is first inserted in the card reader and when the card is ejected. Pictures are also sent to the central server.

What to do

You are asked to conduct a requirement elicitation for the problem described above. You are asked to draw a use case diagram, provide a short (a few lines) description of each actor, and provide a short description of each use case. Short use case descriptions need to clearly state what the use case will be doing and how it will interact

with actors. In case an aspect of the problem statement is not clear, you are urged to make reasonable assumptions, state them precisely, and proceed with your solution.