EECS486 Object-Oriented Methodology

Homework 5

Assigned: 18MR03
Due: 28MR03, by 8:40am
Points Possible: 40 points

- Students will work in assigned groups to complete this homework.
- Diagrams may be drawn using Visio.

Homework Goals and Content

- Increased understanding of the following UML diagrams:
  - Deployment Diagram (Hardware Deployment);
  - Component Diagram (Software Deployment).
- Increased understanding of the interplay between the above diagram types.

Problem Description

Group Composition

Group Formation for Homework 5

- Group A: A Babin, J Beach, N Bowers, Y Cheung;
- Group B: P Edwards, J Engbrecht, A Falkowska, M Feldkamp;
- Group C: M Gatny, M Gimbel, A Gossard, C Grant;
- Group D: C Henderson, B Hummel, S Julias, E Lee;
- Group E: C Lei, D O'Reilly, R Pardanani, D Richter;
- Group F: S Serrano, J Smith, N Sockolosky, J Welt, R Will.

	Phase 1 18-21MR03	Phase 2: 21-25MR03	Phase 3: 25-28MR03
Group A	Class Diagram	Depl & Comp Diagram	Seq & Coll Diagram
Group B	Use Case Diagram	Class Diagram	Depl & Comp Diagram
Group C	Statechart Diagram	Use Case Diagram	Class Diagram
Group D	Object Diagram	Statechart Diagram	Use Case Diagram
Group E	Seq & Coll Diagram	Object Diagram	Statechart Diagram
Group F	Depl & Comp Diagram	Seq & Coll Diagram	Object Diagram

Problem Statement

The following is the description for an ATM machine. It is a generic machine not affiliated with any bank in particular. The user can only make withdrawals from the machine.

The machine is made up of 6 main parts:

1. Card slot;
2. Display screen;
3. Keypad, which has buttons 0-9, Enter, and Cancel button;
4. Four buttons on the side of the screen. There are labeled ###;
5. Money dispenser ;
6. Receipt printer.

There are 5 basic screens that the user will view and interact with:

1. Idle screen, before the card is inserted;
2. Enter PIN screen;
3. Pick account screen;
4. Enter amount screen;
5. 'Thank You' screen.

ATM Operation

When the machine is idling there is a Generic Welcome Message.

The user inserts her/his ATM card. Upon insertion the user is prompted to enter their PIN and press the enter button.

Then, the user is prompted to select from what account he/she would like to make the withdrawal. The choices are Checking and Savings.

The user decides on the amount to withdrawal. The amount must be a multiple of $10.

The machine checks if the amount is correct and if the machine contains enough money to complete the transaction. If correct, then the information is sent to the correct bank system to be validated. Otherwise the appropriate message is displayed and they are taken back to the enter amount screen.

The information sent is the card number, PIN, amount, and account type. The bank system checks the data and either returns:

- OK, if the user has an account of that type with enough money and the PIN and card number match, or
- Not OK, if any part of the validation fails.

If the transaction is valid then the machine dispenses the money. After dispensing the money, the ATM sends an update to the bank to deduct the funds dispensed. (Note that this is not done until the money is dispensed because if the user asks for $40 and due to some mechanical failure only $20 is dispensed the user should not be out $20.) Then the bank acknowledges and deducts the amount and the new balance is returned to the ATM. The new balance is printed on a receipt along with the amount deducted and the receipt and card are returned to the user.

The scenarios to be considered for the Sequence, Collaboration, and Object diagrams are as follows:

a. A successful transaction withdrawing $50;
b. A failed transaction because the machine does not have the funds ;
c. A failed transaction because the user does not have the funds.