Brian Engel

UML Activity and Sequence Diagrams

The use case being described in the activity and sequence diagrams is for withdrawing money from an ATM. The interactions involved in the use case are between the user, the ATM, and the bank. The user is the primary actor, the ATM is the system, and the bank is a secondary actor.

The first diagram is a UML activity diagram that demonstrates the workflow between the user and the system. After the start node, the first step is an action step to verify PIN. Once it returns a true or false for the correct PIN, there is a conditional step. Entering the wrong PIN exits out of the withdraw money use case. Entering the correct PIN continues the process. Next is another action step to ask for the amount. Then there is another conditional step to continue with the next process of dispensing cash if there is enough available in the account. If there is not enough in the account, it skips the process of dispensing the cash. The conditional meets back up at the action step of generate receipt, which then moves to the action step of print receipt. After this it goes to the end node, where it meets up with the first conditional statement.

The second diagram is a UML sequence diagram which shows how objects interact with each other and the user and their sequence. This starts with the user entering the card and the ATM responding by asking for the PIN. Next the user enters the PIN, the ATM verifies the PIN with the bank, the bank responds to the ATM the PIN is valid, and the ATM responds to the user to enter an amount to withdraw. Finally, the user enters an amount, and the ATM responds by dispensing the cash.

There are a few deficiencies in the diagrams. One is that neither gives the card back. The sequence diagram doesn’t verify the amount of cash from the bank, print a receipt, or have an option for an invalid PIN either. To solve the problem of giving the card back it could just be automatic after the transaction or have a user input of whether they want another transaction. If they say yes to another transaction, you will point back to the ask for amount on the activity diagram since you wouldn’t have to verify the PIN again. On the sequence diagram, I’m not sure but could ask the question and if false exit out and if true loop back through, although I’m not sure how or if you can loop back in a sequence diagram since it is always in order. To verify the amount of cash, just ask the bank and if the response is yes, continue as normal, and if the answer is no exit out. To verify the PIN is easier since we already ask the bank. We just need to add if false tell ATM it’s invalid and it will tell the user it is invalid and to reenter or exit out. To print a receipt, after the transaction is complete have the ATM automatically print a receipt.

I decided to redo the UML activity diagram and add the eject card action step. In order to do this, I had to add a few things. First, the obvious step of adding the actual eject card action step. Then I had to add a conditional statement before it to make sure the user was actually done withdrawing money or if they want to withdraw more. If they wanted to withdraw more, I had it point back to the Ask for Amount action step. If not, it points to the eject card action step. I also changed the wrong PIN entered condition to point to the eject card action step.

