Assignment #3

Practice with UML Models

CS 4354 Summer II 2015
Instructor: Jill Seaman

Due: at the beginning of class **Monday, 7/20/2015**
Submit a "hard copy" (probably hand-written, optionally computer-generated) only.
Do this assignment with your partner and submit one copy with both names on it.

1A Draw a **use case diagram** for the Inventory Management program described in Assignment 2. The system includes two actors: the InventoryManager, who adds new product descriptions and removes old or incorrect product descriptions from the inventory on the system; and the FulfillmentSpecialist who fills orders using the system to process the sale. Both actors may display a product given the sku, or view the entire inventory.

1B Extend your diagram from 1A to include the following use case: ProductNotFound, which occurs when a user is trying to remove a product or display a product, and the sku that they entered is not found in the inventory. Use the proper type of relationship to add this use case to your diagram. Note: don't use extend.

1C Extend your diagram from 1B to include the three specialized versions of adding a product: adding a Movie, adding a Book, and adding a Toy. These use cases would add the details of the extra attributes that need to be input in each of these cases. Use the proper type of relationship (but not extend) to add these use cases to your diagram.

Note: You may submit a single diagram as the solution for 1A+1B+1C.

2A Draw a **class diagram** representing the classes used in the solution to Assignment 2. Focus first only on classes and associations, being sure to use the appropriate types of associations in your diagram. Add multiplicity to the class diagram you produced.

2B Extend the class diagram of exercise 2A to include the attributes from the solution program. Note: do **not** include a class field (member variable) if it is used to implement an association.

2C Extend the class diagram of exercise 2B to include operations. Do NOT include the following: constructors, setters+getters, overridden methods.

Note: You may submit a single diagram as the solution for 2A+2B+2C.

3 Draw a **sequence diagram** for the processSale function of Assignment 2. Include the actor bob (the FullfillmentSpecialist), and instances of other classes from Assignment 2. Assume that bob can send the message `input(sku,qty,cost)` directly to the Driver to signify getting those values from the user. The remaining messages in the diagram should come from the operations of the objects involved, as specified in your class diagram from question 2. Return arrows are optional. Activation boxes are required.

4 Draw an **activity diagram** to describe the following process of a library patron checking a book out of the library. The librarian scans the patron's card and checks the account to see if the patron has any unpaid fines. If there is a fine, the patron may immediately pay the fine. If the patron pays the fine, or if there are no fines, the librarian scans the book. Then the librarian adds the book to the patron's account and marks the book as checked out. Use 2 swim lanes and use concurrency for actions that do not need to be in a specific sequence.

5A Draw a **state diagram** to determine the current state of a shareware product. At any given point in time the product will be in one of three states: the trial period (the first state), registered, or unregistered. The two main events are: (1) the user enters a valid license key or (2) the user enters an invalid license key. The system stores the start date (when the user started using the software) and the license key (initially empty). When the system is in the trial period and the current date becomes greater than start date + 30 days, the product becomes unregistered.

5B Add a new state called StartUp to the diagram from 5A and make it the first state. If the start date is not set, then the start date is set to the current date and the system moves into the trial state. Otherwise, the stored values of start date and license key, along with the current date are used to determine which state to immediately transition into.

Note: You may submit a single diagram as the solution for 5A+5B.