SOEN 423

Assignment 2

Design Specification

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Summary

This assignment uses Java IDL, an implementation of the COBRA specification in order to implement a simple distributed store system. The actors of this program consist of store managers and store customers. Store managers can add, remove, or list available items. Store customers can purchase, return, find, or exchange items. Customers are placed in a waiting list if the desired item to purchase is unavailable at the moment of its purchase. There are 3 store locations in different provinces: QC (Quebec), BC (British Columbia), and ON (Ontario).

Items are stored in a Hash Map.

Customer wait lists will be stored in a priority queue of Customers per itemID in a Map.

IDL Architecture

Client Layer

The client layer (applet or application) invokes operations of the server and awaits a response. It then handles the response after it is received.

Server Layer

The server's method is invoked from the client layer, executed on the server side, and returns a certain response.

ORB

The ORB is responsible for sending requests back and forth from client side to server side (sends request and returns response).

Program Structure

This program consists of four main packages: models, Store, StoreApp and frontend.

- **Models**:
    - This package consists of the core data objects for the program.
    - Manager.java : this class is a representation of a manager, and holds its basic information such as the ID and store.
    - Customer.java : this class is a representation of a customer, and holds its basic information such as the ID and balance, and store.
    - Enum Classes: Store
        - all possible options for store locations.

- **StoreApp:**
    - Contains all the generated files from storeApp.idl

- **Store:**
    - This package contains the implementations of all Manager and Customer operations.
    - Manager Operations: addItem, removeItem, listItemAvailability
    - Customer Operations: purchaseItem, returnItem, findItem, exchangeItem

- **Frontend:**
    - This package contains CustomerClient and ManagerClient that are the client side of the application and invoke methods on StoreImpl.

Data Structures

The main data structures used in this assignment: HashMap data structure, and priority queue.

Java HashMap

This data structure is used to store item objects and client objects (wait list) on the server. In the item object, the hash key represents the itemID, and the value represents item objects. In the client object, the hash key represents the itemID and the value represents user objects.

Class Diagrams