CPSC 1181 - Lab 10 [35 marks]

Objectives:

- Build a multithreaded server that implements a supplied protocol.

Submission:

- Zip up all of the Java files and submit them to D2L prior to the due date. **Due date set in D2L.**
- Submissions that are less than 24 hours late receive a 1% per hour late penalty. Submission that are more than 24 hours late will not be accepted.
- Unzipped submissions or submissions containing .class or other unneeded files will be penalized.

Overview

In this lab you will create a Server application that takes reservations for a small hotel. It will allow multiple clients to connect simultaneously. You will also write a Client application that can connect to the server to allow a user to make reservations.

DOWNLOAD THE NEW VERSION OF THE HOTEL CLASS PROVIDED FOR LAB 10

The Hotel Class

You are given a class called Hotel. **Download and do not edit Hotel.java. Include the file in your submission so that the marker does not need to add it manually.** The hotel tracks the current reservations for your hotel **for the month of December only. So it only maintains reservations for the 1st through 31st of December of the one room.**

It contains the following methods.

- boolean requestReservation(String user, int firstDay, int lastDay)
    - Attempt to make a reservation from the firstDay to the lastDay (inclusive) for the person specified by name
    - **Restrictions: a reservation will not be made if…**
        - The user already has a reservation
        - If the values for firstDay or lastDay are invalid in any way.
        - any of the requested days are available
    - Return true if the reservation was made, false if it was not
- boolean cancelReservation(String user)
    - If the specified person has a reservation, it will be cancelled (all of their days become available) and returns true
    - Otherwise, returns false if they did not have a reservation to cancel
- String reservationInformation()

Returns a string containing the full reservation information for the month. For each day displays either available or the name of the person who has the reservation for that day.

Exercise 1

Create the server itself. The table below contains the protocol that the server should follow. After each command the server should respond with the String output from the appropriate Hotel method. The basic structure of a multithreaded server will follow that from our code examples discussed in lecture.

- The server should handle exceptions so that even if one client connection crashes, the server continues to run

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Protocol

- In this protocol, the server always responds with a single String.
- **When a client connects the server should send a welcome message to the client.**
- The **client's first request should always be to set the user**, so that the server knows who is making reservations
    1. If the client sends any other command first, respond with an error message and disconnect.
- The commands are sent as strings and each 'parameter' is sent separately. The USER request requires two writes to the output stream. One for the command "USER" and one for the new name.

Client Request	Server Response	Description
USER ***n***	Hello, ***n***	Change the current user to the String n. (Imagine this as logging in as a user)
RESERVE ***first last***	• Reservation made: ***n*** from ***first*** through ***last*** • Reservation unsuccessful: ***n*** from ***first*** through ***last***	Attempt to make a reservation for the current user from day first to day last (inclusive) first and last are sent as integers (not as a string)
CANCEL	• Reservations successfully canceled for ***n*** • Reservations not canceled for ***n,*** no current reservation.	Cancel any reservations made for the current user.
AVAIL	The full availability info	Send availability information as provided by the Hotel method.
QUIT	Closing Connection	Quit the connection.
Anything else…	Invalid command: Closing Connection	Close the connection.

Exercise 2

Write a client that allows a user to make reservations. When the client starts it will connect to the server and ask the user for their name. Then repeatedly allow the user to use the server's basic commands (reserve, cancel, availability) until the user chooses to quit. The user should be shown a menu that lists their options and allows them to choose any of the five commands, not type the commands in manually. Then disconnect from the server.

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Help

- A pdf with instructions on running multiple applications in multiple consoles in Eclipse is attached to the lab in D2L.
- An automated test client is provided. This allows you to just write your server first. If your Server is running the protocol correctly, the test client will run.

Marking Rubric:

Style, Convention, Documentation [5 marks]

HotelServer [15 marks]

HotelUserClient [15 marks]