Report

Room Booking System

(Bhagyesh Patil 16305R003, Ayush Goyal 16305R011)

System architecture:

Our system follows a 3-tier architecture:

1. Client
2. Sever
3. Database

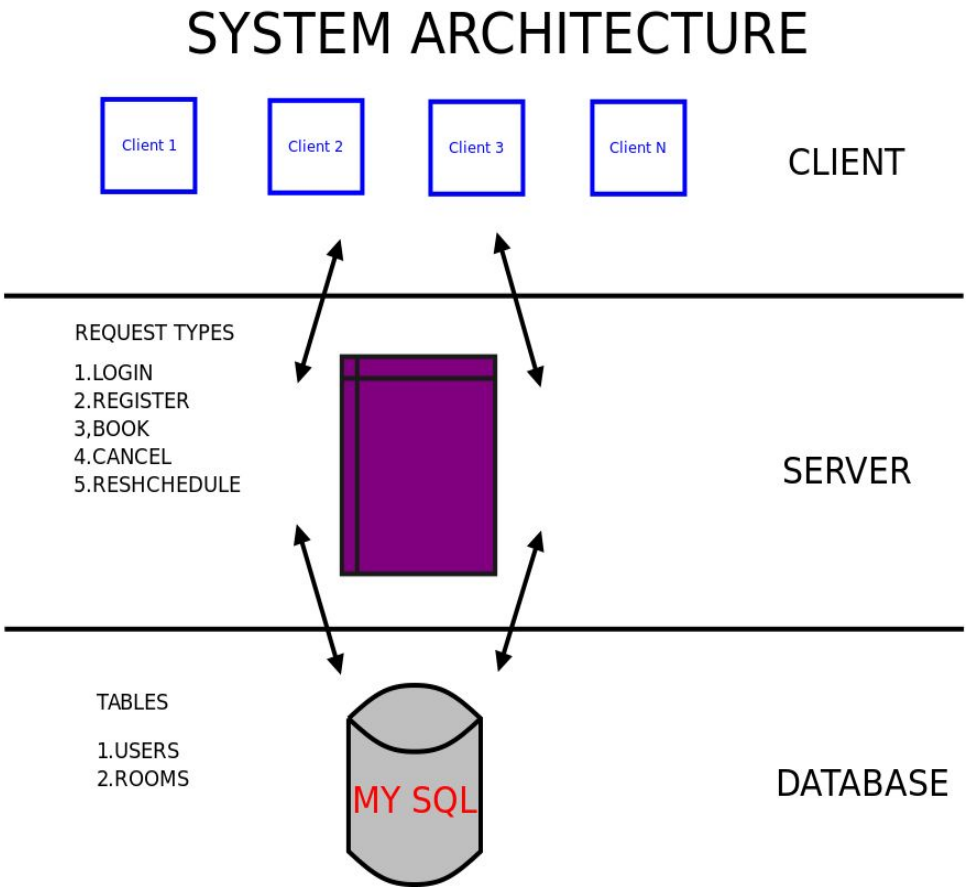
Details : Clients send request to the server. Server communicates with database and processes it. There is no direct communication between client and database.
A client can book a room on a specified date. Various requests can be made by client to book, cancel or reschedule his/her booking. All the requests are managed by server by consulting the database.
The programming language used: C/C++.
The database used: MYSQL Database.

Type of application architecture : Multithreaded
A master process (server) serves as an entry point, and creates a worker thread for each client. We have used ***pthreads*** to implement multithreaded application architecture.

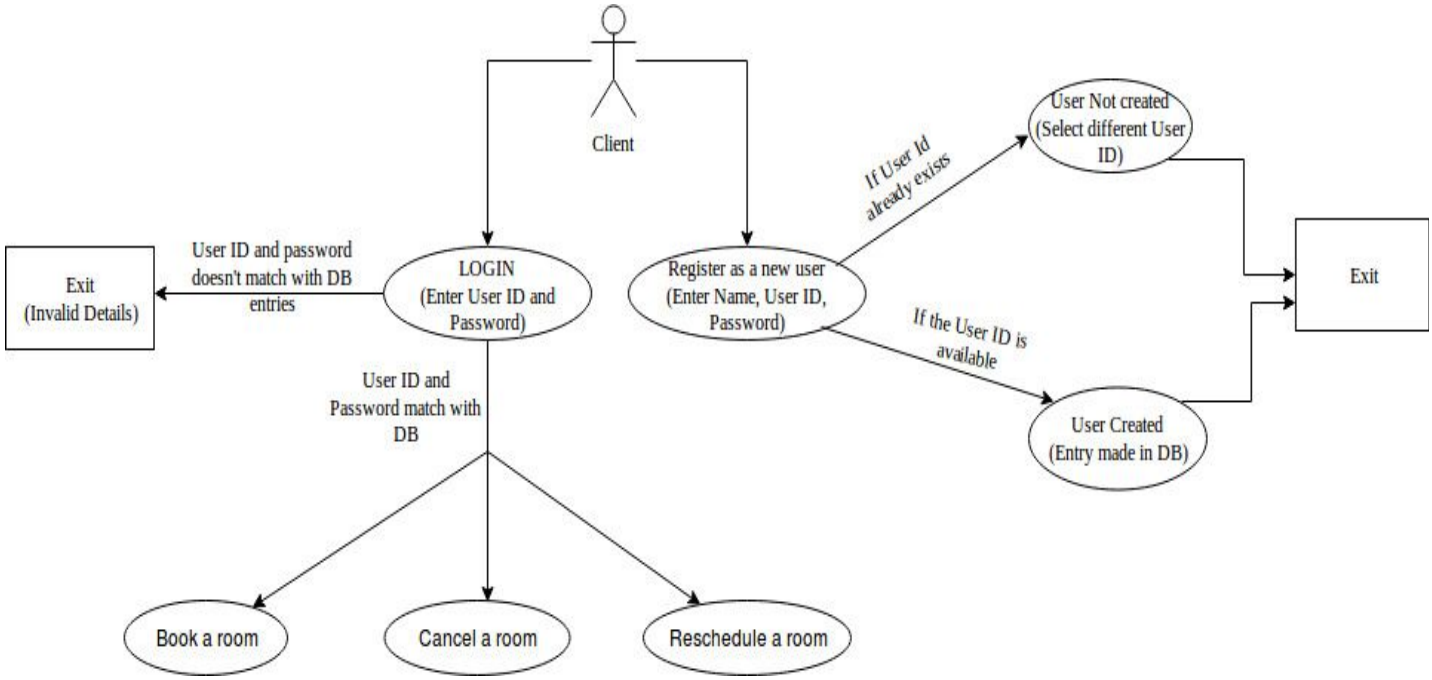
Critical section : Book,Cancel,Reschedule functions are critical sections of the program. Locks are used to protect critical sections and ensure mutual exclusion.

Some critical scenarios:
1. If two clients try to book a room for same date at the same time then they should not be allocated same room number.
2. If only one room is available on a given date and two clients try to book that room at the same time then the room will be allocated to only one user.

Following diagram shows the Overall Architecture of the system:



Flow diagram of the system:



Various Request that can be made by clients:

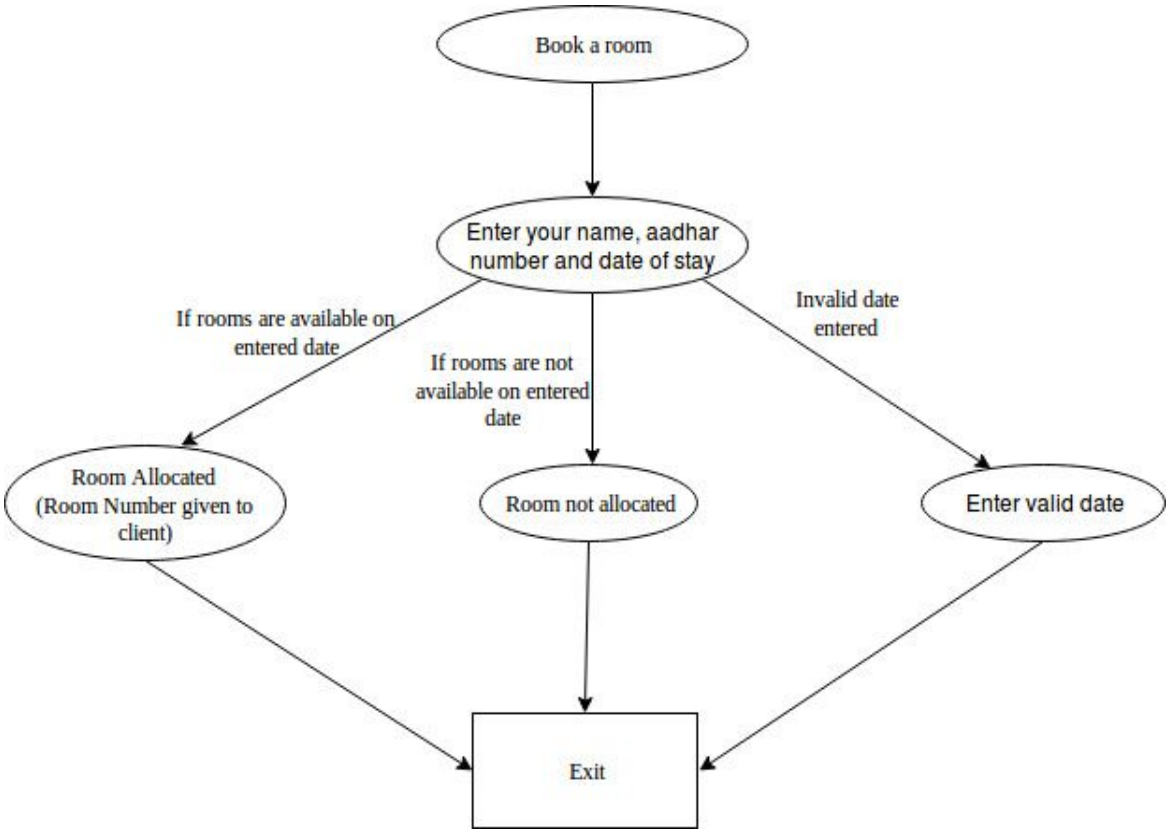
1. Register:
    a. If user is not registered , he/she can register.
    b. If client selects to register - If the user Id the user has chosen is already taken by any other user, then user will not be created, otherwise it will be created and the entry will be made in Database.
2. Login:
    a. If client is registered user, then he/she can login.
    b. User Id and password is required by the user to be authenticated.
    c. Server checks the user Id and password in the database. If entry exist then user is authenticated and then he/she is given three choices - to book,cancel or reschedule the room.

3. Book:

a. If user selects to book a room, he/she is asked to enter the following details:
   i. Name
   ii. Aadhar Number
   iii. Date of the stay

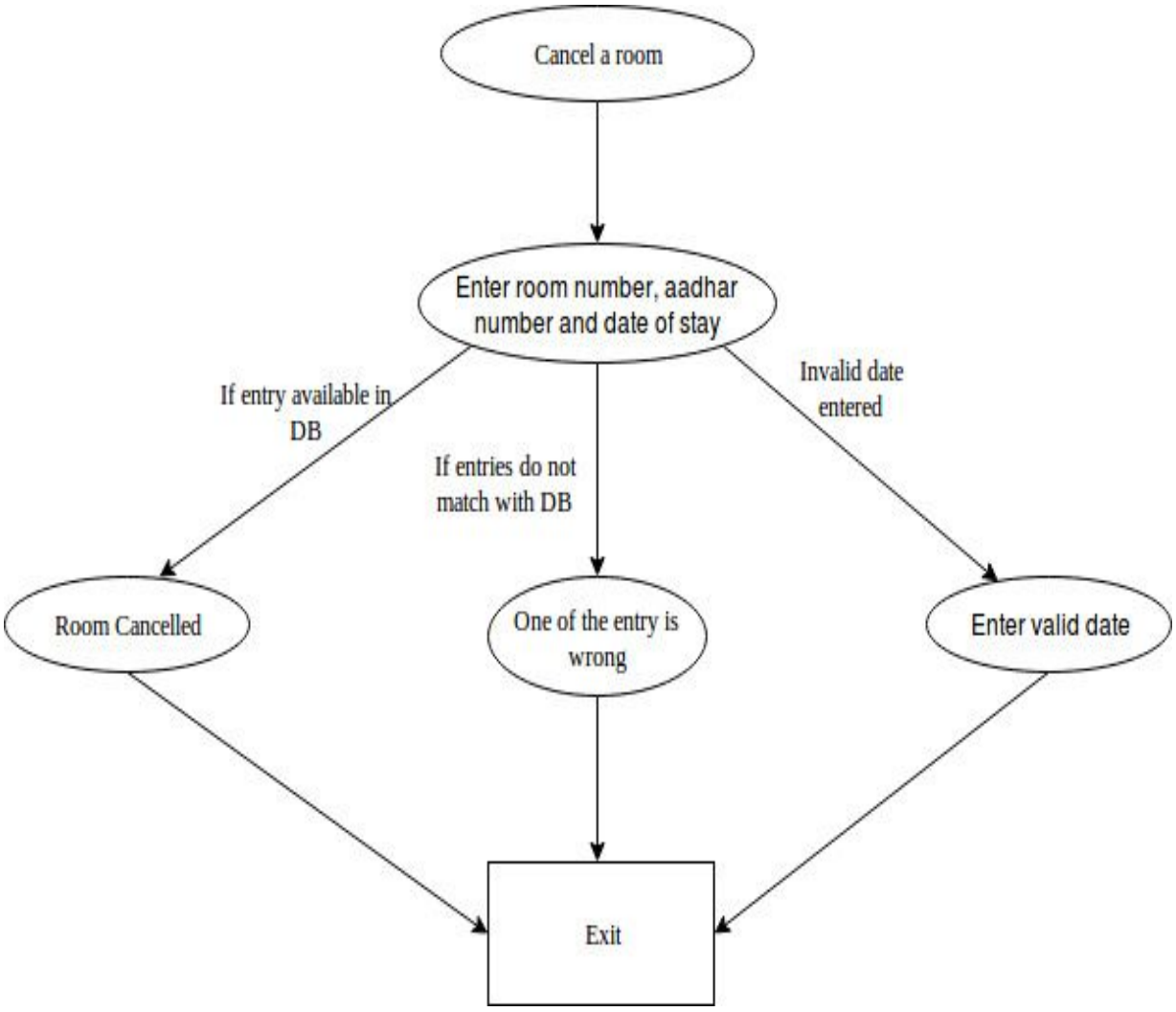
b. If the rooms are available on given date then room is booked and the entry is made in database and room number is given to the user, else room is not allocated.

c. If past date is entered from current date, then invalid date and room is not booked.



4. Cancel:

a. If user selects to cancel a room, he/she is asked to enter following details:
   i. Room number given at the time of booking
   ii. Aadhar number
   iii. Date of the stay
b. If details entered are correct then corresponding entry is removed from the database by the server else error message is shown.



5. Reschedule:

a. If user selects to reschedule his/her booking, he/she is asked to enter following details:
   i. Room number given at the time of booking
   ii. Aadhar number
   iii. Date of current stay
   iv. Date of rescheduling

b. If details entered are correct and room is available on the rescheduling date, then current entry is removed from the database and new entry is made in the database by the server and new room number is given to the user, else error message is shown.