/*

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*/

// **Aim** : Design and develop a distributed Hotel booking application using Java RMI. A distributed hotel booking system consists of the hotel server and the client machines. The server manages hotel rooms booking information. A customer can invoke the following operations at his machine

i) Book the room for the specific guest
ii) Cancel the booking of a guest

RoomBookingServer.java

```
import java.io.*;

import java.rmi.*;

import java.rmi.server.*;


class RoomBookingServer extends UnicastRemoteObject implements RoomBookingInterface {


  /**

   * This is the Server Class. It contains the working methods which can be used

   * by the client.

   */


  protected int day;

  protected int time;

  protected int room;

  protected String str = new String();


  public String RoomListTemp[] = new String[100]; // Temporary store for list of rooms

  public String temp = new String();

  public Room RoomArray[] = new Room[100]; // Array of Room Objects


  RoomList tempList = new RoomList();


  public RoomBookingServer() throws RemoteException {

    super();

  }
```

```
/**
 * This method is called once by the client when the application starts. It
 * reads
 * in the input from the text file and creates an Object for each room with the
 * name and capacity that was specified in the file.
 */

public void initRooms() throws RemoteException {
    String record = null;
    String tempRoom = null;
    String tempCap = null;

    int recCount = 0;
    int num;
    int capacity;

    try {
        // This reads in the text from the file and uses that to create the
        // Room Objects. The name is specified first in the text file and the
        // capacity is specified last. This is manipulated in order to take in
        // these parameters when creating the Rooms.

        BufferedReader b = new BufferedReader(new FileReader("Rooms.txt"));
        while ((record = b.readLine()) != null) {
            num = (record.lastIndexOf(" ", record.length())) + 1;
            tempRoom = record.substring(0, num - 1); // Reads in the Room name from file


            tempCap = record.substring(num, record.length());
            capacity = Integer.parseInt(tempCap); // Reads in the capacity from file


            RoomArray[recCount] = new Room(tempRoom, capacity); // Fills the array with the created
Objects.
            recCount++;
        }
        b.close(); // close the input stream.
    } catch (IOException e) {
        System.out.println("Error!" + e.getMessage());
    }
}

/**
 * This method is used to return the list of rooms and there capacity to the
 * client.
 * It returns a RoomList Object which contains the arrayList of Rooms. The
 * Client
 * can then retrieve a full list of rooms.
 */

public RoomList allRooms() throws RemoteException {
    try {
        BufferedReader in = new BufferedReader(new FileReader("rooms.txt")); // read in the text
file.
        if ((str = in.readLine()) != null) {
            tempList.RoomList[0] = str;
            for (int i = 1; i < 100; i++) {
                if ((str = in.readLine()) != null) {
                    tempList.RoomList[i] = str;
                }
            }
        }
        in.close();
    } catch (IOException e) {
    }
    return tempList;
}

/**
 * This method takes in a string and then compares that string with the name of
 * each Object
 * in the array of Rooms. If it finds the room it returns the index, -1
 * otherwise.
 */
```

```
public int compareRoom(String str) {
   for (int i = 0; i < RoomArray.length; i++) {
      if (RoomArray[i].name.equals(str)) {
         return i;
      }
   }
   return -1;
}

/**
 * This method is used to check whether a room is available or not. Firstly it
 * checks
 * for the room in the array, if it finds it it then checks whether the
 * requested
 * time slot on the requested day is available. It returns a string to the
 * client
 * depending on the value of the timeslot.
 */

public String checkRoom(String r, int day, int startTime) throws RemoteException {
   int i = compareRoom(r);
   if (RoomArray[i].slotAvailable(day, startTime) == true) // calls methos available to Room Object
   {
      String s = "Room is available for booking";
      return s;
   } else {
      String s = "Sorry the room is not available for booking";
      return s;
   }
}

/**
 * This method is used to book a Room. Again it checks whether the slot is
 * available and depending
 * on the result it reserves that slot and informs the client or it informs them
 * that
 * the slot has already been reserved.
 */

public String bookRoom(String r, int day, int startTime) throws RemoteException {
   int i = compareRoom(r);

   if (RoomArray[i].slotAvailable(day, startTime) == true) {
      RoomArray[i].book(day, startTime);
      String s = "Room has been successfully booked.";
      return s;
   } else {
      String s = "Sorry but the Room has already been booked.";
      return s;
   }
}

/**
 * This method is used to calculate the timetable for each room. It returns
 * relevant
 * the 2D array to the client displaying the weekly timetable for the requested
 * room.
 */

public int[][] roomTimeTable(String room) throws RemoteException {
   int i;
   System.out.println("TimeTable" + room);
   for (i = 0; i < RoomArray.length; i++) {
      if (RoomArray[i].name.equals(room)) {
         return RoomArray[i].daySlot;
      } else {
         System.out.println("Searching for the room");
      }
   }

   return RoomArray[i].daySlot;
}
```

```
    // Main Method
    public static void main(String[] args) {
        try {
            RoomBookingServer server = new RoomBookingServer();
            String name = "rmi://localhost:9999/RoomBookingSystem";
            // Naming.bind (name, server);
            // String name = "RoomBookingSystem";
            Naming.bind(name, server);
            System.out.println(name + " is running");
        } catch (Exception ex) {
            System.err.println(ex);
        }
    }
}
```

RoomBookingClient.java

```
import java.rmi.*;
import java.rmi.server.*;
import java.io.*;

class RoomBookingClient {

    /**
     * This is the Client Class. It takes an input from the user, calls the methods
     * available
     * to the client from the server class and gives an ouput depending on the
     * operation performed.
     */

    public static boolean validChoice = true;
    static String[] daysOfWeek = { "Monday   |", "Tuesday  |", "Wednesday|", "Thursday |", "Friday   |",
"Saturday |",
            "Sunday   |" };

    public static void main(String[] args) {
        try {
            // System.setSecurityManager ( new RMISecurityManager ( )); //set up the
            // security manager
            String name = "rmi://localhost:9999/RoomBookingSystem"; // connect on local
            // host on port 9999
            // String name = "rmi://127.0.0.1/RoomBookingSystem";
            RoomBookingInterface rbi = (RoomBookingInterface) Naming.lookup(name);

            rbi.initRooms(); // set up the room booking system

            while (validChoice != false) {
              // A small command line interface for the user to use the system.
              System.out.println(" ");
              System.out.println("********************Room Booking
Service********************");
              System.out.println("");
              System.out.println("                    Please select a service");
              System.out.println("");
              System.out.println("1. List of all rooms.");
              System.out.println("2. Check availability of a room.");
              System.out.println("3. Book a room.");
              System.out.println("4. Display weekly timetable for a room.");
              System.out.println("");

              // A buffered reader to allow input from the command line from the user.
              BufferedReader input = new BufferedReader(new InputStreamReader(System.in));
              System.out.println("");
              System.out.println("Select a number between 1 and 4, 0 to exit");
              System.out.println("");
              System.out.flush();
              String response = input.readLine();

              int i = Integer.parseInt(response);
              RoomList ListOfAllRooms = new RoomList(); // RoomList Object which stores
                                            // a list of all the rooms available.

              try {
                switch (i) {
                  case 0:
```

```
    System.out.println("Goodbye"); // User has quit the application.
    validChoice = false;
    break;

case 1:
    System.out.println("");
    System.out.println("The full list of rooms is as follows");
    System.out.println("");
    System.out.println("Room|Capacity");
    System.out.println("----|--------");
    ListOfAllRooms = rbi.allRooms(); // Run the allRooms method which
                                      // returns the list of all rooms.

    for (int c = 0; c < 100; c++) // Print the list.
    {
        if (ListOfAllRooms.RoomList[c] == null) {
            break;
        }
        System.out.println(ListOfAllRooms.RoomList[c]);
    }
    System.out.println("");
    break;

case 2:
    System.out.println("");
    System.out.println("Check a room");
    System.out.println("Enter the room name");
    String check_room = input.readLine();

    System.out.println("Enter the day - ");
    System.out.println("0=Mon , 1=Tues, 3=Wed ,4=Thurs , 5=Fri, 6=Sat, 7=Sun");
    String check_day = input.readLine();
    int real_day = Integer.parseInt(check_day);

    System.out.println("Enter the start time - ");
    System.out.println(
                "0=8am , 1=9am , 2=10am , 3=11am , 4=12pm , 5=1pm , 6=2pm , 7=3pm ,
8=4pm , 9=5pm , 10=6pm , 11= 7pm");
            String check_time = input.readLine();
            int real_time = Integer.parseInt(check_time);

            // This checks whether a room is available given the room name, day and time.
            String temp = rbi.checkRoom(check_room, real_day, real_time);
            System.out.println(temp);
            System.out.println("");
            break;

          case 3:
            System.out.println("Room Booking Service - Rooms can be booked from 8am to
8pm");
            System.out.println("");
            System.out.println(
                "Time slots go from 0 for 8am up to 11 for 7pm - Enter a value in this range");
            System.out.println("");
            System.out.println("Enter the room name");
            String book_room = input.readLine();

            System.out.println("");
            System.out.println("Enter the day -");
            System.out.println("0=Mon , 1=Tues, 3=Wed ,4=Thurs , 5=Fri, 6=Sat, 7=Sun");
            String book_day = input.readLine();
            int real_day2 = Integer.parseInt(book_day);

            System.out.println("");
            System.out.println("Enter the start time -");
            System.out.println(
                "0=8am , 1=9am , 2=10am , 3=11am , 4=12pm , 5=1pm , 6=2pm , 7=3pm ,
8=4pm , 9=5pm , 10=6pm , 11= 7pm");
            String book_time = input.readLine();
            int realb_time = Integer.parseInt(book_time);

            // This checks whether a room is available, if it is it then reserves the room.
            String resp = rbi.bookRoom(book_room, real_day2, realb_time);
            System.out.println(resp);
```

```
                        System.out.println("");
                        break;

                    case 4:
                        System.out.println("Enter the Room name");
                        String Room1 = new String();
                        Room1 = input.readLine();

                        // This checks the timetable for a room. A 2D array containing
                        // the timetable is returned from the server.

                        System.out.println("TimeSlot | 0 1 2 3 4 5 6 7 8 9 10 11");
                        int rtt[][] = (int[][]) rbi.roomTimeTable(Room1).clone();
                        for (int f = 0; f < 7; f++) {
                            System.out.println("");
                            System.out.print(daysOfWeek[f]);

                            for (int j = 0; j < 12; j++) {
                                System.out.print(" ");
                                System.out.print(rtt[f][j]);
                            }

                        }
                        System.out.println("");
                        System.out.println(" ");
                        System.out.println("The key to start times is as follows... ");
                        System.out.println(
                                "0 = 8am , 1 = 9am , 2 = 10am , 3 = 11am , 4 = 12pm , 5 = 1pm , 6 = 2pm , 7 =
3pm , 8 = 4pm , 9 = 5pm , 10 = 6pm , 11 = 7pm");
                        System.out.println("");
                        break;
                    }
                } catch (Exception e) {
                    System.err.println("Sorry but you have entered one of the fields incorrectly, Please try
again ");
                }
            }
        } catch (Exception ex) {
            System.err.println(ex);
        }
    }
}
```

Room.java

```
import java.io.*;
import java.rmi.*;
import java.rmi.server.*;
import java.io.Serializable;

class Room implements Serializable {
    /*
     * This is the Room class. Each Room Object has a name and a capacity. It also
     * contains a 7 * 12 array which represents the 7 days of the week and the
     * 12 hours between 8 am and 8pm(The valid hours for booking a room).
     */

    int daySlot[][] = new int[7][12]; // represents days and hours

    String name;
    int capacity;

    public Room(String n, int cap) // constructor that sets all slots to zero - unbooked
    {
        this.name = n;
        this.capacity = cap;

        for (int i = 0; i < 7; i++) {
            for (int j = 0; j < 11; j++) {
                this.daySlot[i][j] = 0;
            }
        }
    }

    /**
     * This Method is used to check whether a particular timeslot on a particular
     * day
     * has already been booked. If the slot contains a 1 then it has already been
     * booked.
     * If it contains a 0 then it is available. The method returns a true or false
     * value.
     */

    public boolean slotAvailable(int day, int slot) {
        if (daySlot[day][slot] == 1) {
            return false;
        } else {
            return true;
        }
    }

    /**
     * This Method is used to book a slot. It sets the relevant slot to a 1.
     */

    public void book(int day, int slot) {
        this.daySlot[day][slot] = 1;
    }
}
```

RoomBookingInterface.java

```
import java.rmi.*;
import java.rmi.server.*;

/**
 * This is the interface, it contains the 5 methods which the Client can use.
 */

public interface RoomBookingInterface extends Remote {
    public void initRooms() throws RemoteException;

    public RoomList allRooms() throws RemoteException;

    public String checkRoom(String r, int day, int startTime) throws RemoteException;
    public String bookRoom(String r, int day, int startTime) throws RemoteException;
    public int[][] roomTimeTable(String room) throws RemoteException;
}
```

RoomList.java

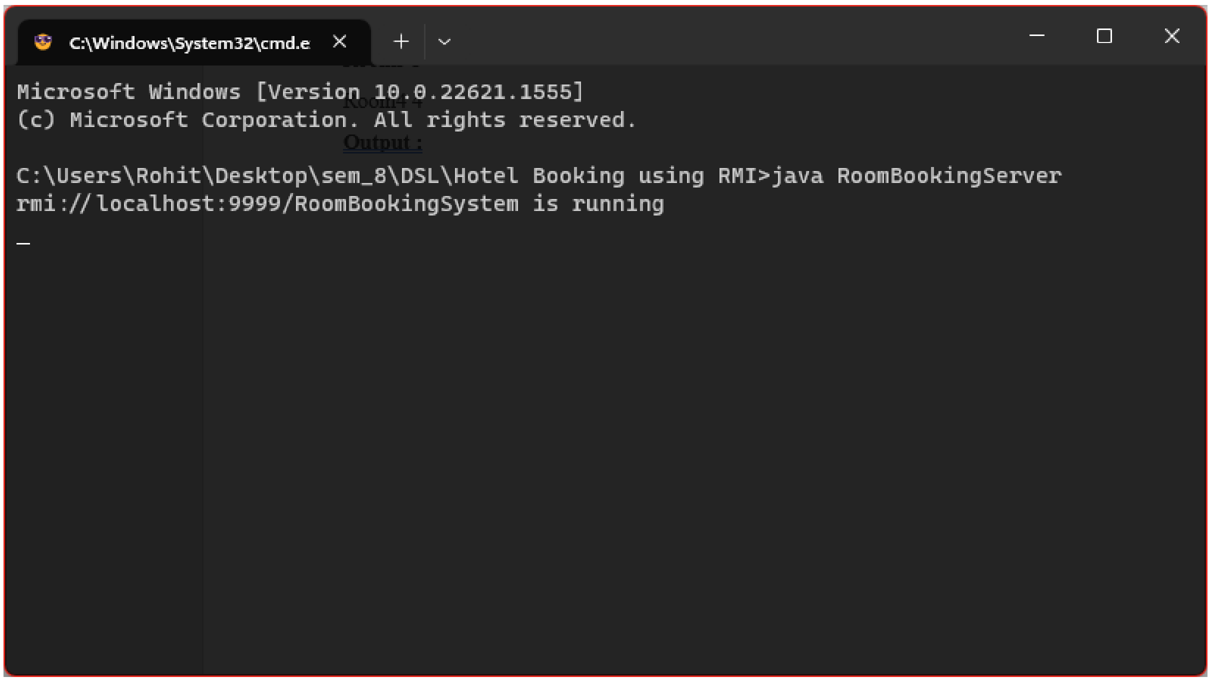
```
import java.io.*;
import java.rmi.*;
import java.rmi.server.*;
import java.io.Serializable;

class RoomList implements Serializable {
    public String RoomList[] = new String[100];
    // contains an array which holds the maximun number of rooms. To allow for
    // more rooms just increase the size of this array.
}
```

Rooms.txt

```
Room1 1
Room2 2
Room3 3
Room4 4
```

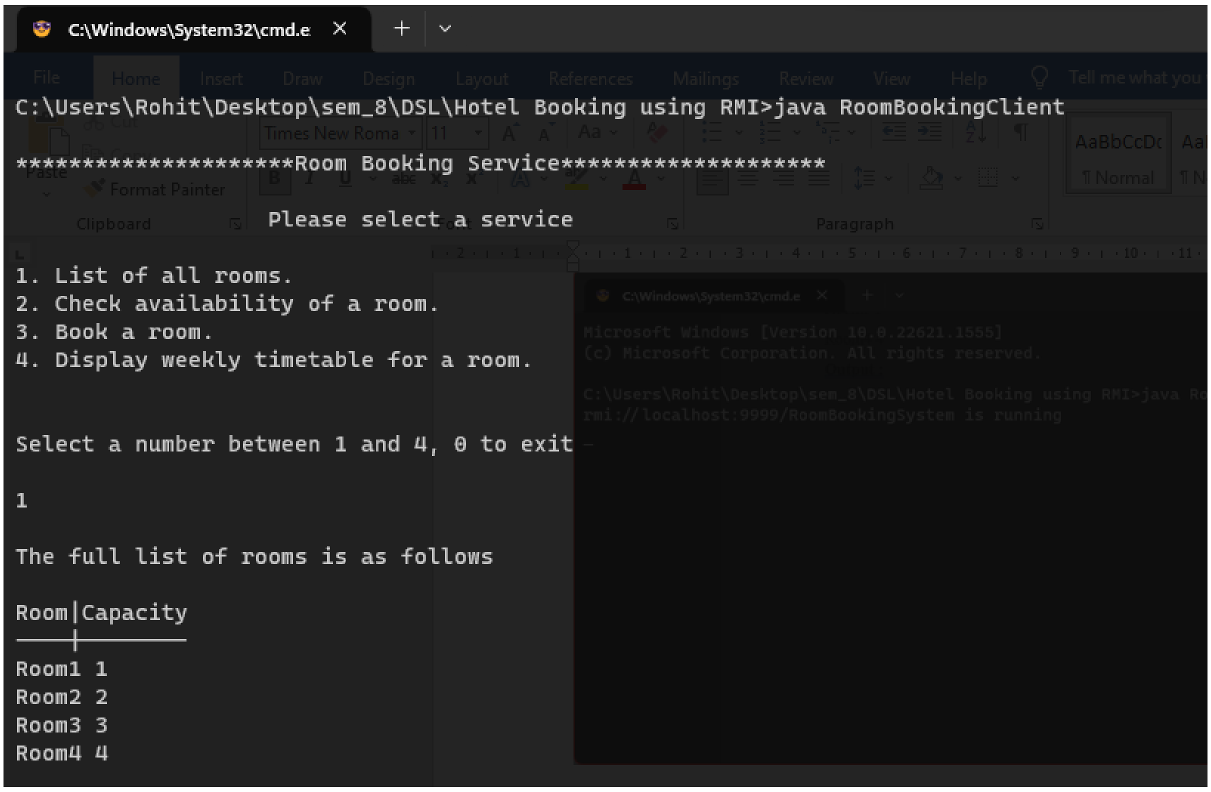
Output :

RoomBookingServer.java

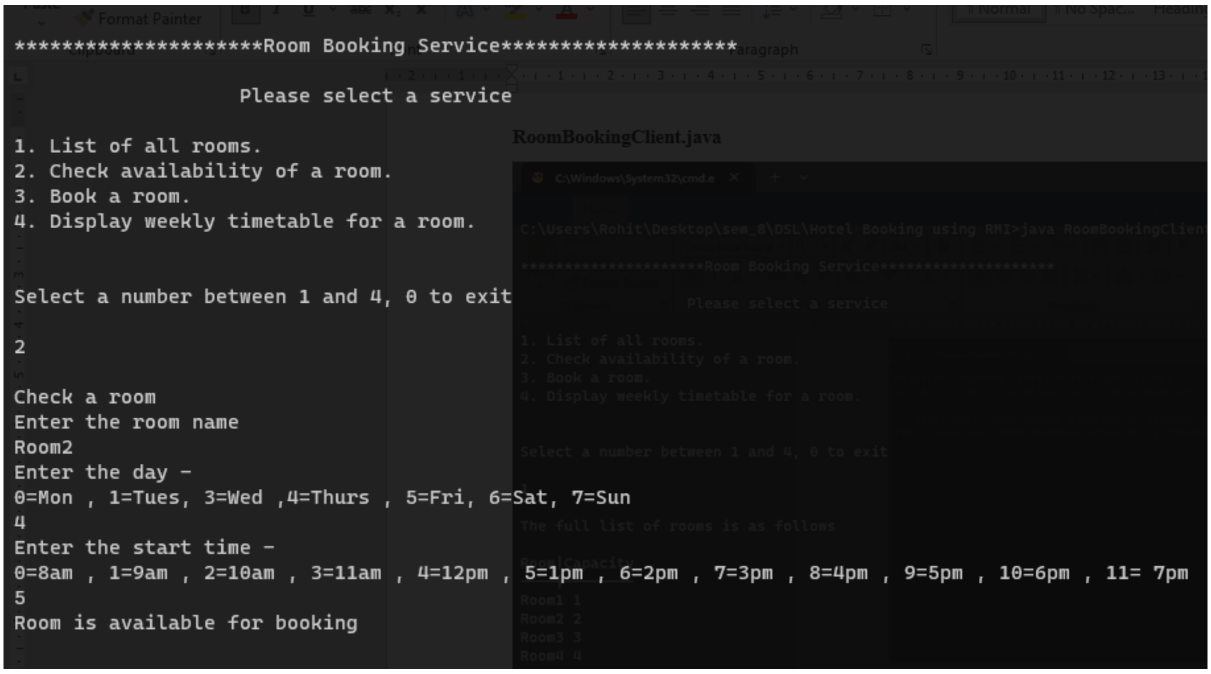


```
Microsoft Windows [Version 10.0.22621.1555]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Rohit\Desktop\sem_8\DSL\Hotel Booking using RMI>java RoomBookingServer
rmi://localhost:9999/RoomBookingSystem is running
_
```

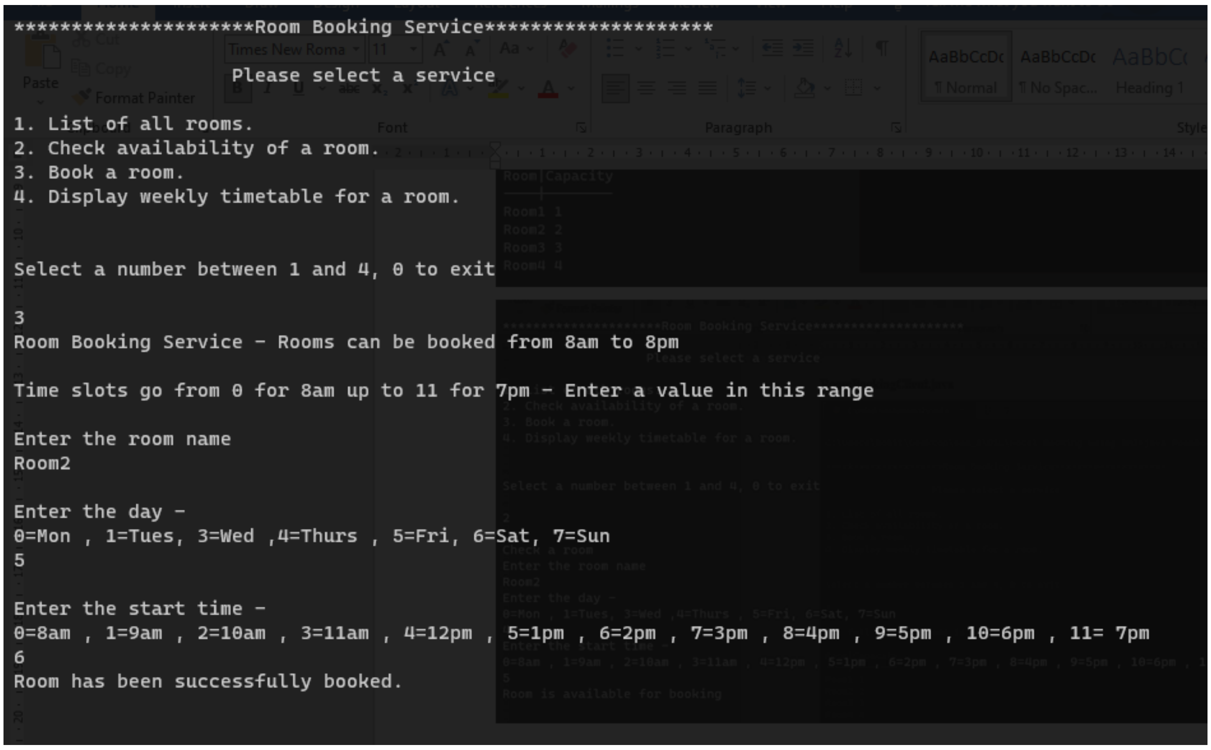
RoomBookingClient.java



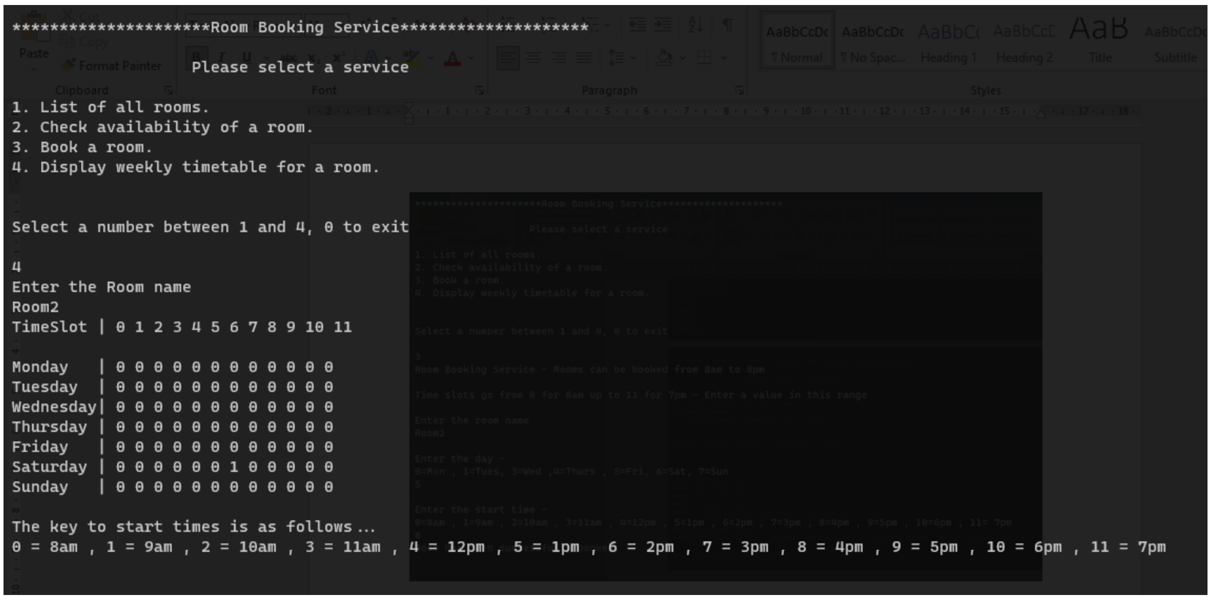
```
C:\Users\Rohit\Desktop\sem_8\DSL\Hotel Booking using RMI>java RoomBookingClient

*********************Room Booking Service*******************

                   Please select a service

1. List of all rooms.
2. Check availability of a room.
3. Book a room.
4. Display weekly timetable for a room.


Select a number between 1 and 4, 0 to exit

1

The full list of rooms is as follows

Room|Capacity
────┼────────
Room1 1
Room2 2
Room3 3
Room4 4
```



```
*********************Room Booking Service*******************

                   Please select a service

1. List of all rooms.
2. Check availability of a room.
3. Book a room.
4. Display weekly timetable for a room.


Select a number between 1 and 4, 0 to exit

2

Check a room
Enter the room name
Room2
Enter the day -
0=Mon , 1=Tues, 3=Wed ,4=Thurs , 5=Fri, 6=Sat, 7=Sun
4
Enter the start time -
0=8am , 1=9am , 2=10am , 3=11am , 4=12pm , 5=1pm , 6=2pm , 7=3pm , 8=4pm , 9=5pm , 10=6pm , 11= 7pm
5
Room is available for booking
```



```
*********************Room Booking Service*********************
                   Please select a service

1. List of all rooms.
2. Check availability of a room.
3. Book a room.
4. Display weekly timetable for a room.


Select a number between 1 and 4, 0 to exit

3
Room Booking Service - Rooms can be booked from 8am to 8pm

Time slots go from 0 for 8am up to 11 for 7pm - Enter a value in this range

Enter the room name
Room2

Enter the day -
0=Mon , 1=Tues, 3=Wed ,4=Thurs , 5=Fri, 6=Sat, 7=Sun
5

Enter the start time -
0=8am , 1=9am , 2=10am , 3=11am , 4=12pm , 5=1pm , 6=2pm , 7=3pm , 8=4pm , 9=5pm , 10=6pm , 11= 7pm
6
Room has been successfully booked.
```



```
*********************Room Booking Service*********************
                   Please select a service

1. List of all rooms.
2. Check availability of a room.
3. Book a room.
4. Display weekly timetable for a room.


Select a number between 1 and 4, 0 to exit

4
Enter the Room name
Room2
TimeSlot | 0 1 2 3 4 5 6 7 8 9 10 11

Monday   | 0 0 0 0 0 0 0 0 0 0 0 0
Tuesday  | 0 0 0 0 0 0 0 0 0 0 0 0
Wednesday| 0 0 0 0 0 0 0 0 0 0 0 0
Thursday | 0 0 0 0 0 0 0 0 0 0 0 0
Friday   | 0 0 0 0 0 0 0 0 0 0 0 0
Saturday | 0 0 0 0 0 0 1 0 0 0 0 0
Sunday   | 0 0 0 0 0 0 0 0 0 0 0 0

The key to start times is as follows...
0 = 8am , 1 = 9am , 2 = 10am , 3 = 11am , 4 = 12pm , 5 = 1pm , 6 = 2pm , 7 = 3pm , 8 = 4pm , 9 = 5pm , 10 = 6pm , 11 = 7pm
```