# A PROJECT ON

**Train Reservation System**

SUBMITTED IN

PARTIAL FULFILLMENT OF THE REQUIREMENT

FOR THE COURSE OF DIPLOMA IN ADVANCED COMPUTING FROM CDAC

****

#### SUNBEAM INSTITUTE OF INFORMATION TECHNOLOGY

Hinjawadi

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Sunbeam Institute of Information Technology, Pune

ACKNOWLEDGEMENT

A project usually falls short of its expectations unless aided and guided by the right persons at the right time. We offer this opportunity to express our deep gratitude towards Mr. Nitin Kudale (Center Coordinator, Sunbeam, Pune) and Mr. Yogesh Kolhe (Course Coordinator, Sunbeam, Pune).

We are deeply indebted and grateful to them for their guidance, encouragement, and deep concern for our project. Without their critical evaluation and suggestions at every project stage, this project could never have reached its present form.

At last, we thank the entire faculty and the staff members of Sunbeam Institute of Information Technology, Pune for their support.

Prakash Kumar Rathour

CDAC March 23 Batch,

Sunbeam Pune

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9. **INTRODUCTION TO PROJECT**

The web-based “Train Reservation System” project is an attempt to stimulate the basic concepts of the Train reservation system. The system enables the customer to do things such as search for a railway for two travel cities on a specified date, choose a Railway based on the details, and reservation of Railway.

The system provides you Quick Search facility that provides you details about Railways without login. But if the user wants to book a ticket then it must require login into your account.

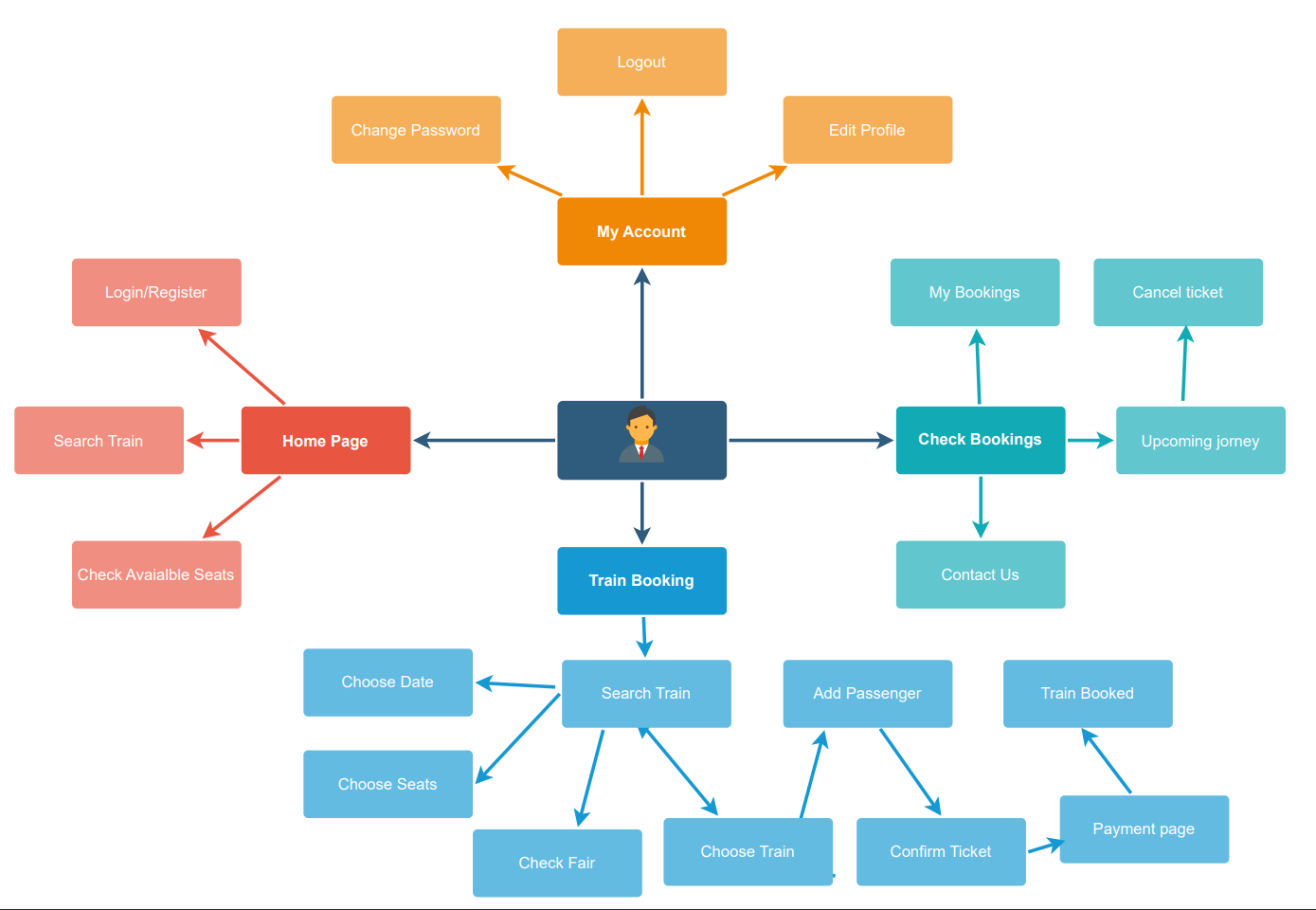
The system allows the Railway passenger to search for Railways that are available between the two travel cities, namely the “Source Station” and “Destination Station” for particular departure and arrival dates. The system displays all the Railway’s details such as Railway name, number, arrival and departure time of journey, etc.

Here we provide a quick search facility that displays a list of available Railways and allows customers to choose a particular Railway. Then the system checks for the availability of seats on the Railway. If the seats are available then the system allows the passenger to book a seat. Otherwise, it asks the user to choose another Railway.

To book a Railway the system asks the customer to enter his details such as name, number, age, gender, and berth preference. Then it checks the validity of the card book the Railway and updates the Railway database and user database.

**2. REQUIREMENTS**

**2.1 FUNCTIONAL REQUIREMENTS**

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**Fig.** User Flow

**2.1 User Account**

The passenger, who will also be called the ‘User’, will be presented with 3 choices by the reservation system, as the first step in the interaction between them. A user can choose one of these: Check Bookings, seat availability, Fare of the Ride, Distance, and time. His choice would be governed by whether he is a guest or a registered user and whether he wants to check the availability of tickets or block/buy them. The terms ‘registered user’ and ‘guest’ are described below.

A user who has traveled by the Railway earlier would have been given a user ID and a password. This ‘personal information’ would be henceforth referred to as ‘My Profile’. Such a user with a profile in DB-user shall be called a ‘User’. A registered user will be able to check the availability of tickets as well as block/buy a ticket by logging into the system.

A new user, on the other hand, would either have to

1. Register himself with the system by providing personal information or
2. Log into the system as a guest.

In the case of ‘a, the new user becomes a registered user.

In the case of ‘b’, the new user would remain a guest.

A guest can only check the availability of tickets and cannot block or buy tickets.

However, a registered user can also act as a guest if he only wants to check the availability of tickets.

‘Availability of tickets’ always refers to viewing the Railway schedule for given days, the price of tickets. The system shall present the user with an option to exit from the system at any time during the following processes.

**2.2 Registration and creation of user profile**

The system shall require a user to register, to carry out any transactions with it except for checking the availability of tickets. It will ask the user for the following information at the least – first name, last name, address, email address, username, phone number, gender, age, and password. The system will automatically create a field and initialize it to zero in the user’s profile.

****

**Fig:** Registration(New User) Flow

* 1. **Quick Search**

Here we provided a Quick Search facility for any user to search the Railway schedule without logging into an account. This will provide users an option to search the Railway and compare the prices of all companies.

After logging in to a user (either a registered user or a guest), the system shall

request him to enter the following details – origin city and destination city. “City’ is

a generic term and refers to a city or town as the case may be. The original destination

cities would be entered as text.

After the origin and destination cities are ascertained, the system shall now access the Railway schedule database, referred to as ‘Railwaymaster’, and check if there is a direct operational service between the two cities.

The system shall now ask the user to enter the following details - class, one-way,

ar round trip, departure date, and the number of adult passengers, children, and senior citizens.

‘Class’ refers to Business class/Economy class. This choice shall be made by the user

through a drop-down menu indicating all the possible combinations of choices.

One-way/round trip shall be button selection. ‘Departure date’ refers to either a single date or a range of dates, entered through a text box. In case, the trip is a round trip, the system shall also ask the user to enter the return date

Having taken all the above input from the user, the system checks for any false entries like the departure date on the return trip being earlier than the departure date on the onward trip. In case of incompatibility, the system will not display any Railways available.

The system queries the Railways database ‘Railwaymaster’ to check which of the Railways on the schedule have seats available. The system displays the results in a suitable form (a tabular form) with the following information depicted – for each Railway-Id, Railway number, departure time in origin city, arrival time in destination city, departure city, arrival city, Ticket price, and the number of seats available on that Railway.

There can be several Railways of different Railways between two cities and all of them will be listed for the particular date that the user wants to depart from the Origin City. In case, the user has entered a range of dates, the system shall display all the Railways for all those dates in the range. There will be a Book button in front of every row displayed n the table of Railways searched.

The system will then ask for personal information of all passengers i.e. one registered user can book for multiple users. So all users will be added in the table.

The system shall now display the price of the ticket for the trip. This will be the sum of the prices for all the members of the travel party being represented by the user.

* 1. **Making Reservations/Blocking/Confirmation**

After having taken the user through step 2.2, Checking Availability, The system will now ask the user if he wishes to block/buy the ticket. If yes, and

1. if the user has been a guest, he will have to first register and become a registered user and then log onto the system.
2. If the user is already a registered user, and if he has logged on already, he can block/buy the ticket, but if he has been acting as a guest, he will have to log on.

Having ensured that the user is logged on validly according to 3.4.1, the system compares the departure date with the system date. If the departure date falls within 2 weeks of the system date, the system informs the user that he has no option to block the ticket and asks him if he would like to buy it.

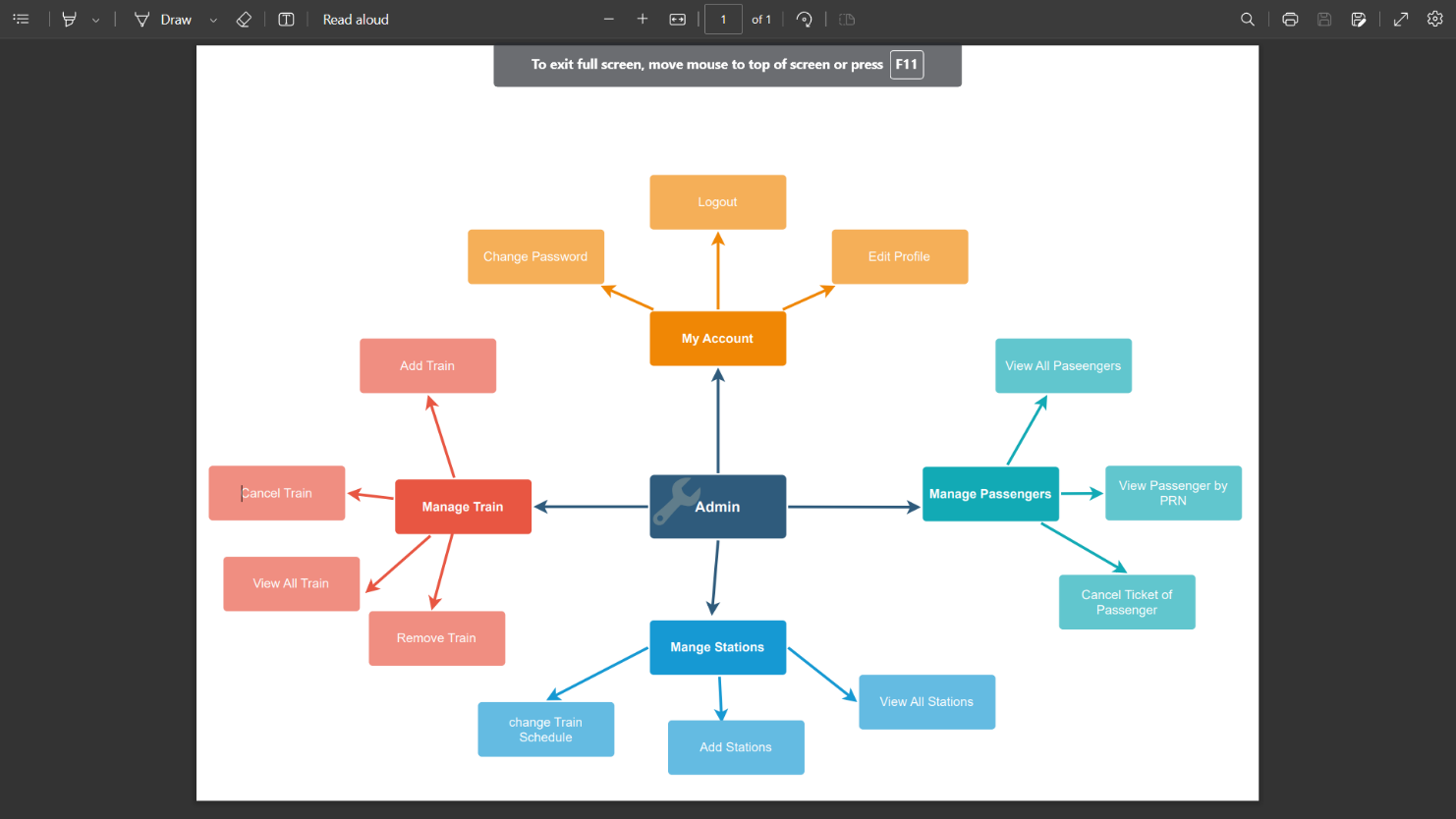
If the difference between the departure date and system date is more than 2 weeks, the system asks the user if he would like to block or buy the ticket. The system informs the user that he can block the ticket at no cost now. It also informs him that if he chooses to block the ticket, he should make a final decision before 2 weeks of the departure date. The system shall send an email to the user.

Having taken the input from the user in 3.4.2, the system shall now proceed to update the reservation database DB-reservation. It will decrement the number of available seats on the particular Railway for a particular class by the number of travelers being represented by the user.

In case the user buys the ticket, the system asks for entering his or her bank information i.e. debit card or credit card information and then charges the price of the ticket to his debit card number.

**2.5 View Booking History**

The system shall allow a user to view all information about his previous bookings. After logging him on, it asks for his blocking number or his confirmation number. It accesses the User Booking table retrieves the details of the trip and presents them to the user in a tabular format.

****

**Fig.** Admin Flow

Admin should be able to log in, add Railway information, add Railway information,

Delete Railway and see user Information according to user Id.

* 1. **NON-FUNCTIONAL REQUIREMENTS**

**2.2.1 Interface**

Go to Appendix B for user interfaces

**2.2.2 Performance**

* **Number of Concurrent Users:**

TRS shall be able to handle at least 1000 transactions/inquiries per second

* **Booking of Tickets:**

The system is susceptible to any temporary server failure since it uses the strong feature of Struts 2 and Hibernate. Hence the examination will be continued even if the sever gets disconnected in between the examination.

**2.2.3 Constraint**

TRS shall be able to handle at least 1000 transactions/inquiries per second

**2.2.4 Other Requirements:**

* **Hardware Interfaces**

The SPMS is expected to function on an Intel PIII 900 MHz Processor equivalent or above, 128 MB RAM, and 20 GB HDD.

* **Software Interfaces**

The SPMS shall work on MS Windows operating systems family (MS Windows 98, MS Windows NT Workstation, MS Windows 2000, MS Windows XP). It configures to work with Oracle database. This System works on Apache Tomcat server. It uses browser IE 5.0 & above. It uses IIS 5.0 server.

**3. DESIGN**

**3.1 Database Design**

The following table structures depict the database design.

1. **Table1: Users**

|  |  |  |  |
| --- | --- | --- | --- |
| **Column Name** | **Data Type** | **Allow Null** | **Key Type/ Constraint** |
| id | bigint | NO | PRI |
| address | varchar(255) | YES |  |
| email | varchar(70) | NO | UNI |
| first\_name | varchar(50) | NO |  |
| gender | varchar(10) | YES |  |
| last\_name | varchar(50) | NO |  |
| mobile | varchar(15) | NO | UNI |
| password | varchar(100) | NO |  |
| reg\_date | date | YES |  |
| role | varchar(25) | YES |  |
| Username | varchar(100) | NO | UNI |

* + 1. **Table2: Passengers**

|  |  |  |  |
| --- | --- | --- | --- |
| id | bigint | NO | PRI |
| boogie\_no | varchar(255) | YES |  |
| booking\_date | date | NO |  |
| gender | varchar(6) | NO |  |
| name | varchar(100) | NO |  |
| pnr | varchar(10) | YES | UNI |
| seat\_no | varchar(5) | YES |  |
| seat\_status | varchar(10) | YES |  |
| train\_departure\_date | date | NO |  |
| destination\_station | bigint | NO | MUL |
| origin\_station | bigint | NO | MUL |
| train\_no | bigint | NO | MUL |
| user\_id | bigint | NO | MUL |

1. **Table3: seats**

|  |  |  |  |
| --- | --- | --- | --- |
| id | bigint | NO | PRI |
| boogie | varchar(255) | YES |  |
| class\_type | varchar(20) | YES |  |
| seat\_type | varchar(20) | YES |  |
| total\_seat | int | YES |  |
| train\_id | bigint | YES | MUL |

1. **Table4: Canceled Seats**

|  |  |  |  |
| --- | --- | --- | --- |
| id | bigint | NO | PRI |
| boogie | varchar(255) | YES |  |
| class\_type | varchar(20) | YES |  |
| seat\_type | varchar(20) | YES |  |
| seat\_number | bigint | YES | MUL |
| train\_id | bigint | YES | MUL |

1. **Table5: Live Seats**

|  |  |  |  |
| --- | --- | --- | --- |
| id | bigint | NO | PRI |
| available\_seats | int | YES |  |
| boogie | varchar(255) | YES |  |
| class\_type | varchar(20) | YES |  |
| destination\_time | date | YES |  |
| seat\_type | varchar(20) | YES |  |
| train\_id | bigint | YES | MUL |

1. **Table6: Payments**

|  |  |  |  |
| --- | --- | --- | --- |
| id | bigint | NO | PRI |
| amount | double | NO |  |
| payment\_date\_time | datetime(6) | NO |  |
| status | varchar(255) | NO |  |
| transaction\_id | bigint | YES |  |
| passenger\_id | bigint | YES | MUL |
| user\_id | bigint | YES | MUL |

* + 1. **Table7: Trains**

|  |  |  |  |
| --- | --- | --- | --- |
| id | bigint | NO | PRI |
| fri | bit(1) | YES |  |
| mon | bit(1) | YES |  |
| origin\_dest\_distance | double | YES |  |
| origin\_time | time | YES |  |
| sat | bit(1) | YES |  |
| sun | bit(1) | YES |  |
| thu | bit(1) | YES |  |
| train\_name | varchar(100) | NO |  |
| train\_no | bigint | NO | UNI |
| train\_speed | bigint | YES |  |
| train\_type | varchar(15) | YES |  |
| tue | bit(1) | YES |  |
| wed | bit(1) | YES |  |

* + 1. **Table8: Running Trains**

|  |  |  |  |
| --- | --- | --- | --- |
| id | bigint | NO | PRI |
| delay | bigint | YES |  |
| origin\_date | date | YES |  |
| current\_station\_id | bigint | YES | MUL |
| train\_id | bigint | YES | MUL |

1. **Table9: Distance**

|  |  |  |  |
| --- | --- | --- | --- |
| id | bigint | NO | PRI |
| distance | float | NO |  |
| destination\_station\_id | bigint | NO | MUL |
| origin\_station\_id | bigint | NO | MUL |

1. **Table10: Stations**

|  |  |  |  |
| --- | --- | --- | --- |
| id | bigint | NO | PRI |
| city\_name | varchar(30) | NO |  |
| code | varchar(10) | NO | UNI |
| name | varchar(80) | NO |  |

**4. CODING STANDARDS IMPLEMENTED**

* + 1. **Naming and Capitalization**

Below summarizes the naming recommendations for identifiers in Pascal casing is used mainly (i.e. capitalize first letter of each word) with camel casing (capitalize each word except for the first one) being used in certain circumstances.

|  |  |  |  |
| --- | --- | --- | --- |
| **Identifier** | **Case** | **Examples** | **Additional Notes** |
| Class | Pascal | Person, BankVault, SMSMessage, Dept | Class names should be based on "objects" or "real things" and should generally be **nouns**. No ‘\_’ signs allowed. Do not use type prefixes like ‘C’ for class. |
| Method | Camel | getDetails, updateStore | Methods should use **verbs** or verb phrases. |
| Parameter | Camel | personName, bankCode | Use descriptive parameter names. Parameter names should be descriptive enough that the name of the parameter and its type can be used to determine its meaning in most scenarios. |
| Interface | Pascal with "I" prefix | Disposable | Do not use the ‘\_’ sign |
| Property | Pascal | ForeColor, BackColor | Use a noun or noun phrase to name properties. |
| Associated private member variable | \_camelCase | \_foreColor, \_backColor | Use underscore camel casing for the private member variables |
| Exception Class | Pascal with "Exception" suffix | WebException, |  |

* + 1. **Comments**
* Comment each type, each non-public type member, and each region declaration.
* Use end-line comments only on variable declaration lines. End-line comments are comments that follow code on a single line.
* Separate comments from comment delimiters (apostrophe) or // with one space.
* Begin the comment text with an uppercase letter.
* End the comment with a period.
* Explain the code; do not repeat it.

**5. TEST REPORT**

**Another group called Linux did the testing and the report of the testing is given hereunder.**

**GENERAL TESTING:**

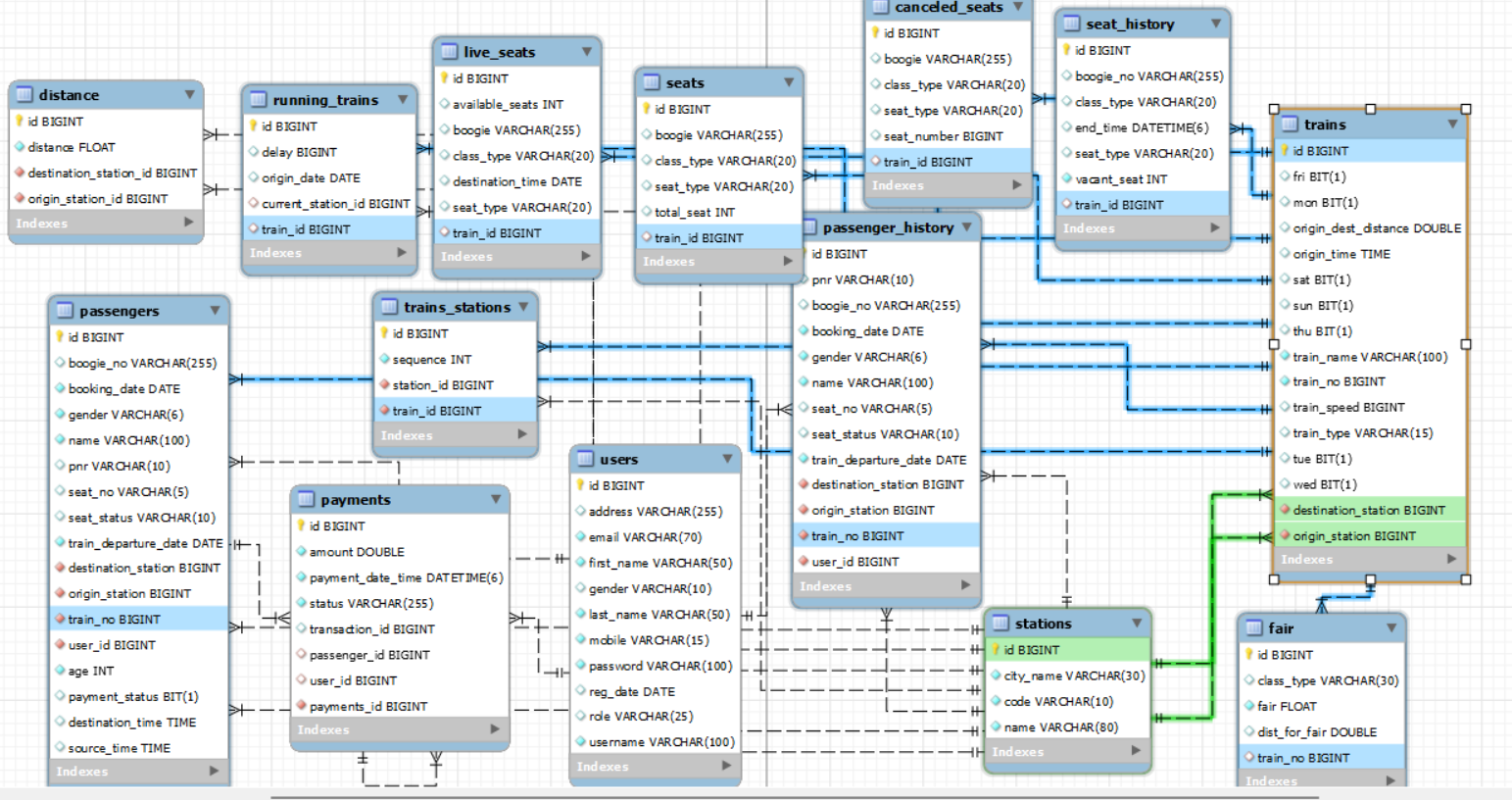
|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **SR-NO** | **TEST CASE** | **EXPECTED RESULT** | **ACTUAL RESULT** | **ERROR MESSAGE** |
| 1 | Register Page | Redirected to Next page | OK | Nothing |
| 2 | Login Page | Pop-up will come | Ok | Please enter username and password again . |
| 3 | Booking Ticket | All the fields should be filled for submission | Ok | Nothing |
| 4 | Checking login or not | User is logged in or not | Ok | Nothing |
| 5 | Add person details for tickets | Add informations according to no of seats allocated | Ok | Nothing |
| 6 | Goto ticket page | Set added information about person | Ok | Nothing |
| 7 | Add information in booking table | Save this all data into booking table | Ok | Nothing |
| 8 | Transaction | On back it should be reverted to previous page | Ok | Nothing |
| 9 | View transaction done | It shows you all transactions done previously | Ok | Nothing |
| 10 | Logout | It will logout from user profile. | Ok | Nothing |

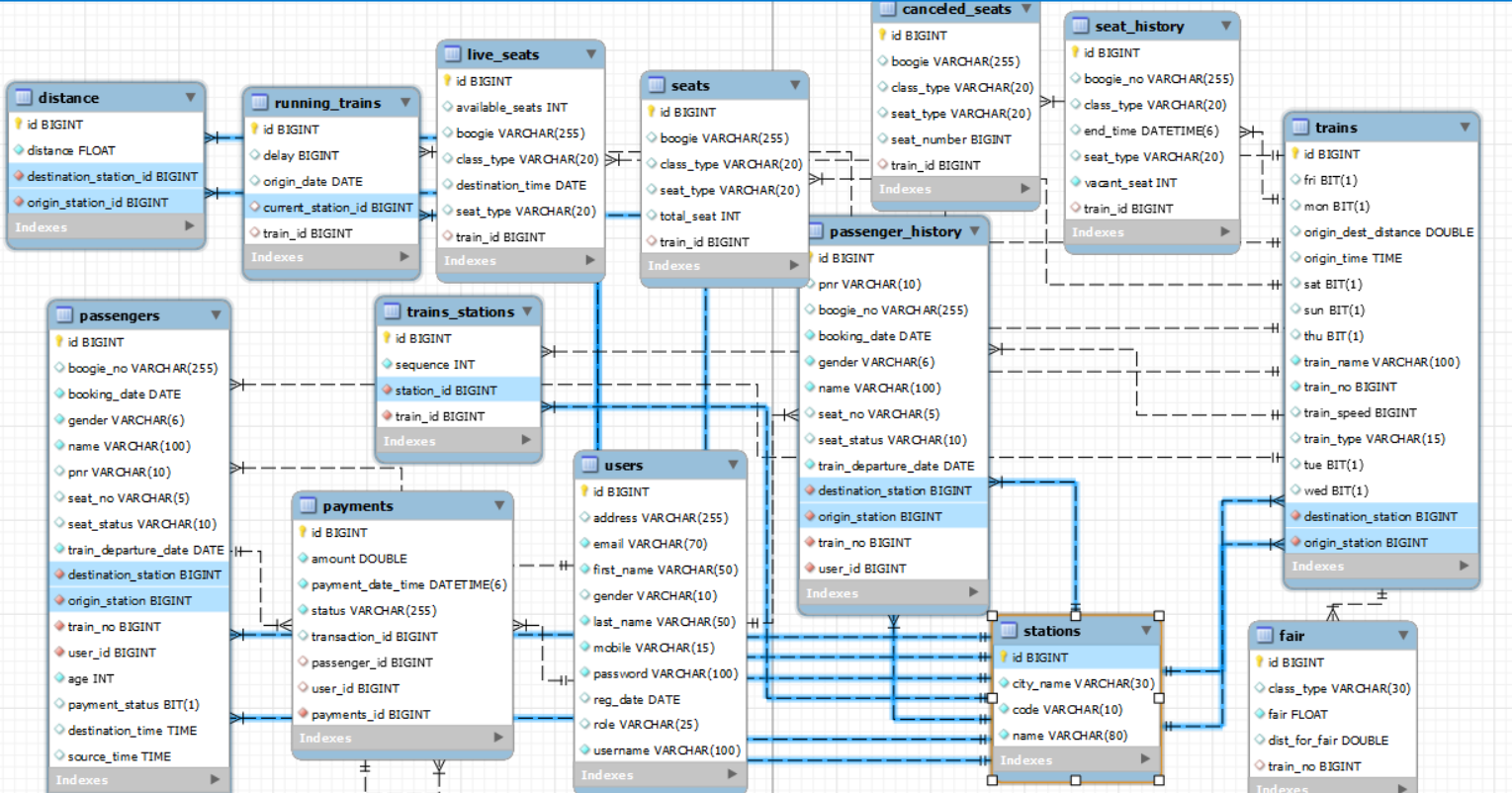
**6. PROJECT MANAGEMENT RELATED STATISTICS**

|  |  |  |  |
| --- | --- | --- | --- |
| **DATE** | **WORK PERFORMED** | 1. ***SLC Phase*** | **Additional Notes** |
| Aug 12,2023 | Project Allotment and User Requirements Gathering | Feasibility Study | Our team met the client Mr. Nitin Kudale (CEO, SIIT Pune) to know his requirements. |
| Aug 13, 2023 | Initial SRS Document Validation  And Team Structure Decided | Requirement Analysis  (Elicitation) | The initial SRS was presented to the client to understand his requirements better |
| Aug 14, 2023 | Designing the use cases, Class Diagrams, Collaboration Diagram, E-R Diagram and User Interfaces | Requirement Analysis &  Design Phase | Database Design completed |
| Aug 15-19, 2023 | Business Logic Component design Started | Design Phase | ---------------------- |
| Aug 20, 2023 | Coding Phase Started | Coding Phase | 70% of Class Library implemented. |
| Aug 21, 2023 | Implementation of Web Application and Window Application Started | Coding Phase | Class Library Development going on. |
| Aug 22, 2023 | Implementation of Web Application and Window Application Continued | Coding Phase | Business Logic Development |
| Aug 23, 2023 | Implementation of Web Application and Window Application Continued | Coding Phase and Unit Testing | Class Library Modified as per the need. |
| Aug 24, 2023 | Implementation of Web Application and Window Application Continued | Coding Phase and Unit Testing | -- |
| Aug 25, 2023 | After Ensuring Proper Functioning the Required Validations were Implemented | Coding Phase and Unit Testing | Module Integration was done by the Project Manager |
| Aug 26, 2023 | The Project was Tested by the respective Team Leaders and the Project Manager | Testing Phase (Module Testing) | -- |
| Aug 27, 2023 | The Project was Submitted to Other Project Leader of Other Project Group For Testing | Testing Phase (Acceptance Testing) | The Project of Other Team was Taken up by the Team for Testing |
| Aug 28-29, 2023 | The Errors Found were Removed | Debugging | The Project was complete for submission |
| Sep 1, 2023 | Final Submission of Project |  |  |

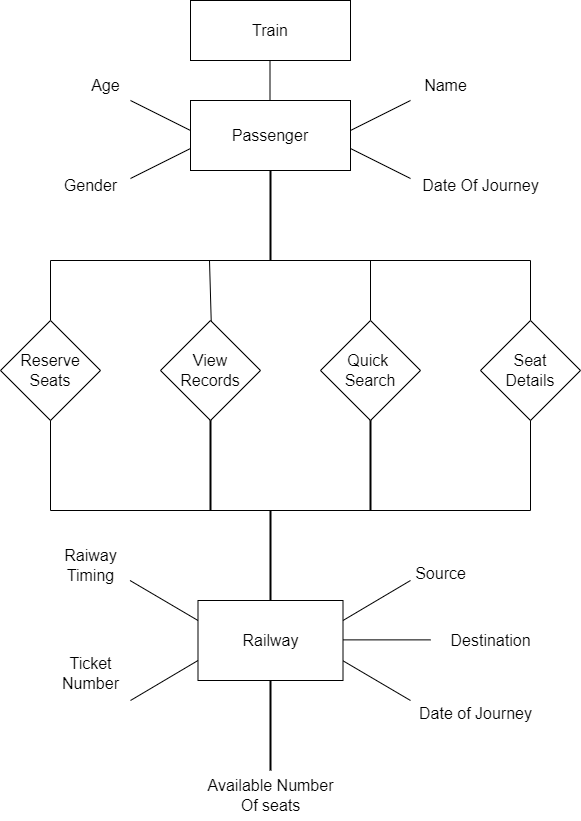
**Appendix A**

**Entity Relationship Diagram**



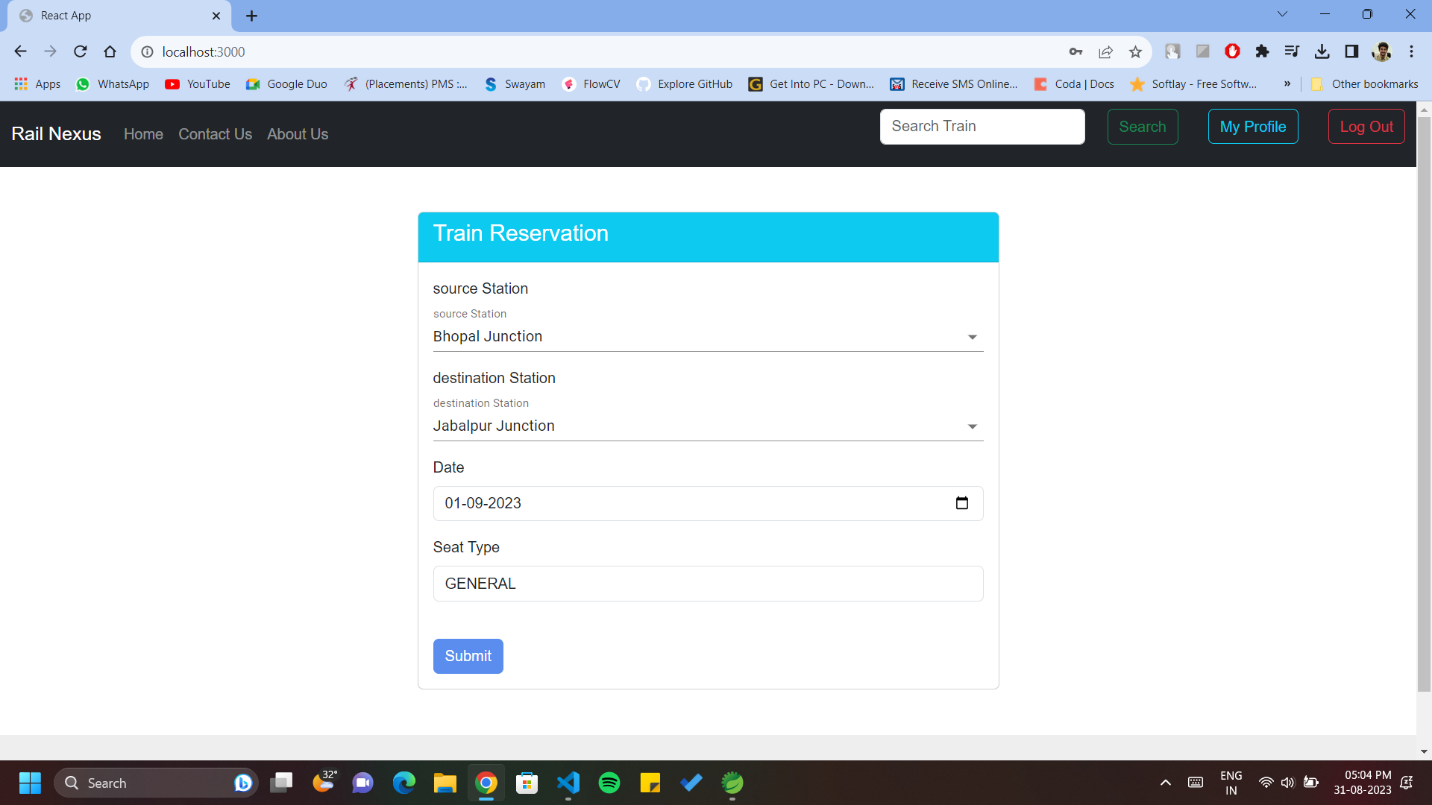


**Data Flow Diagram:**

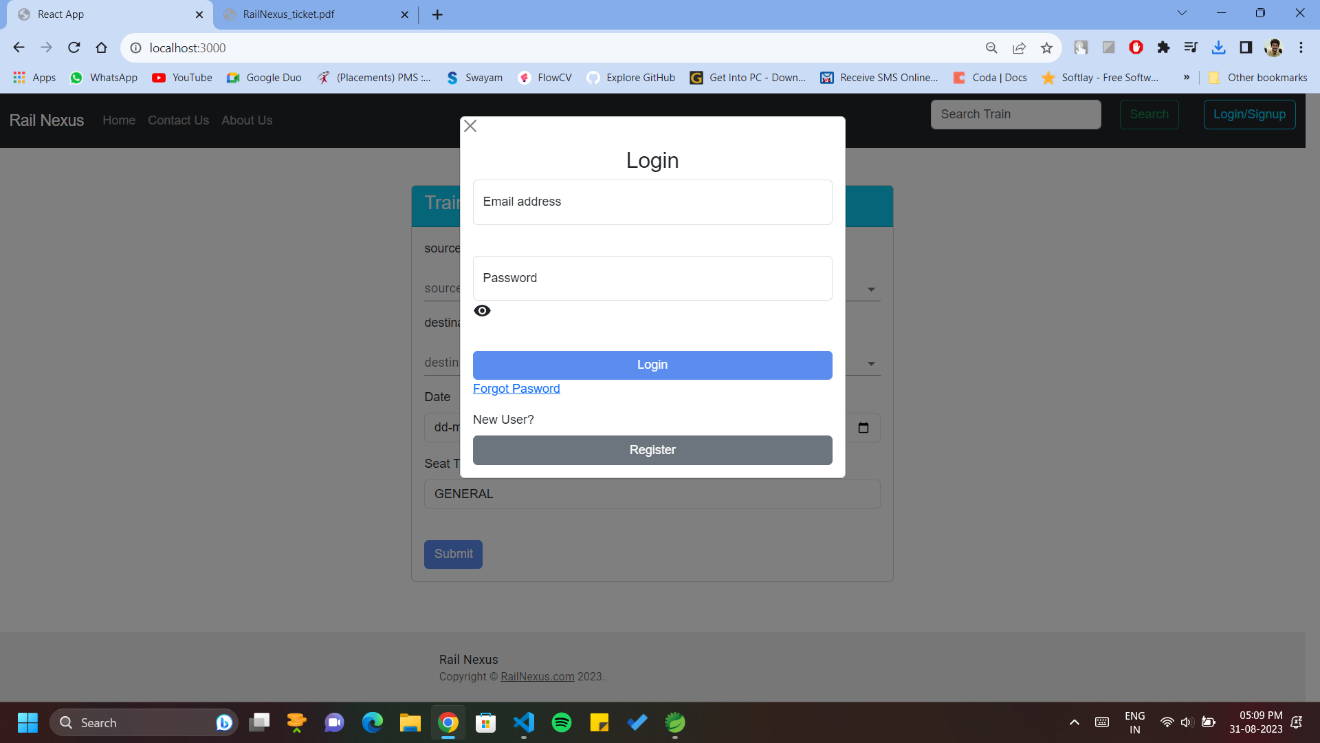
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**7. UI (User Interface)**

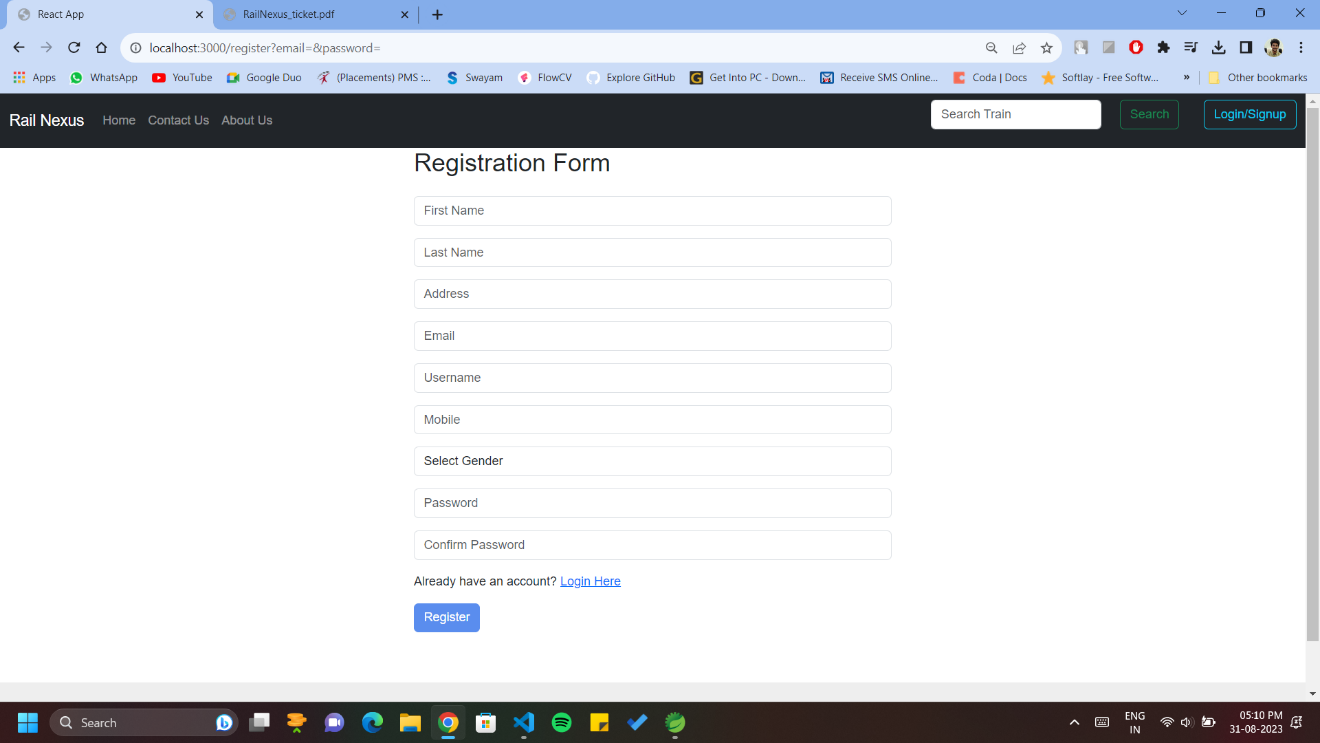
1. **Homepage:**



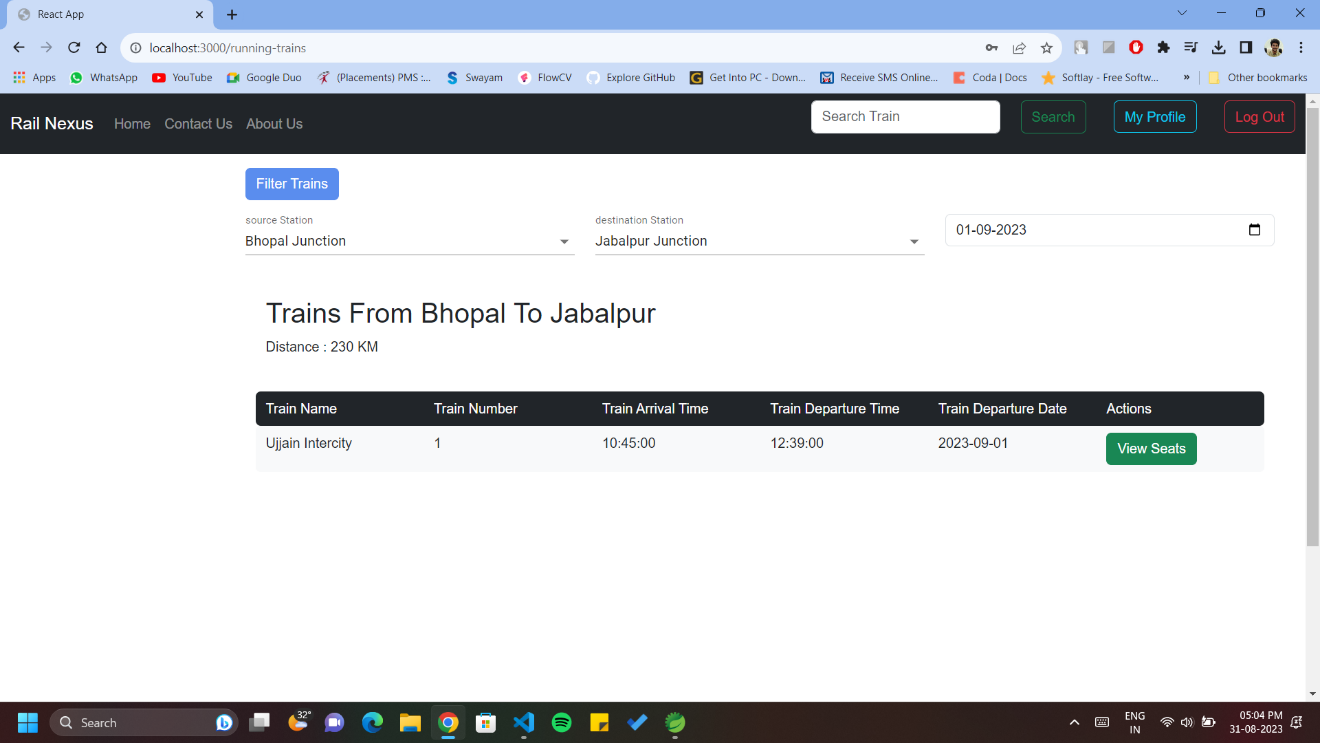
1. **Login:**



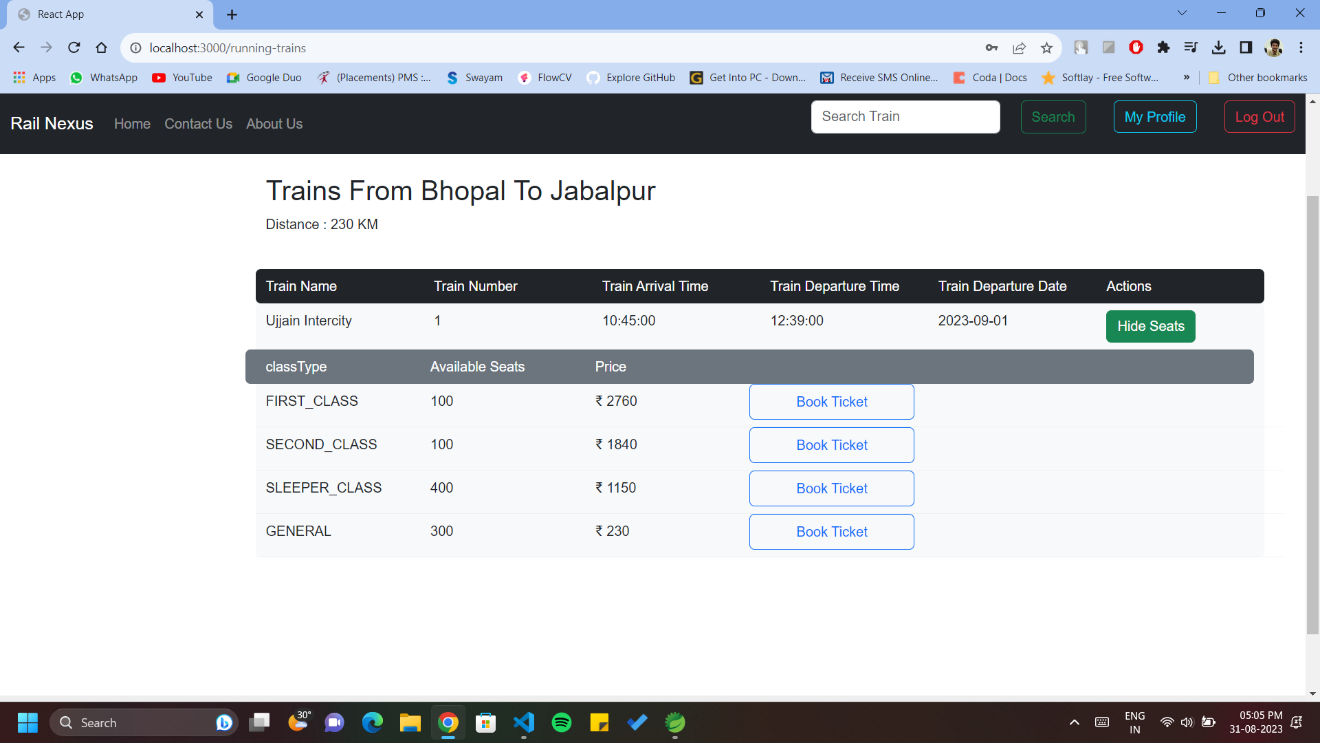
1. **Register new user:**



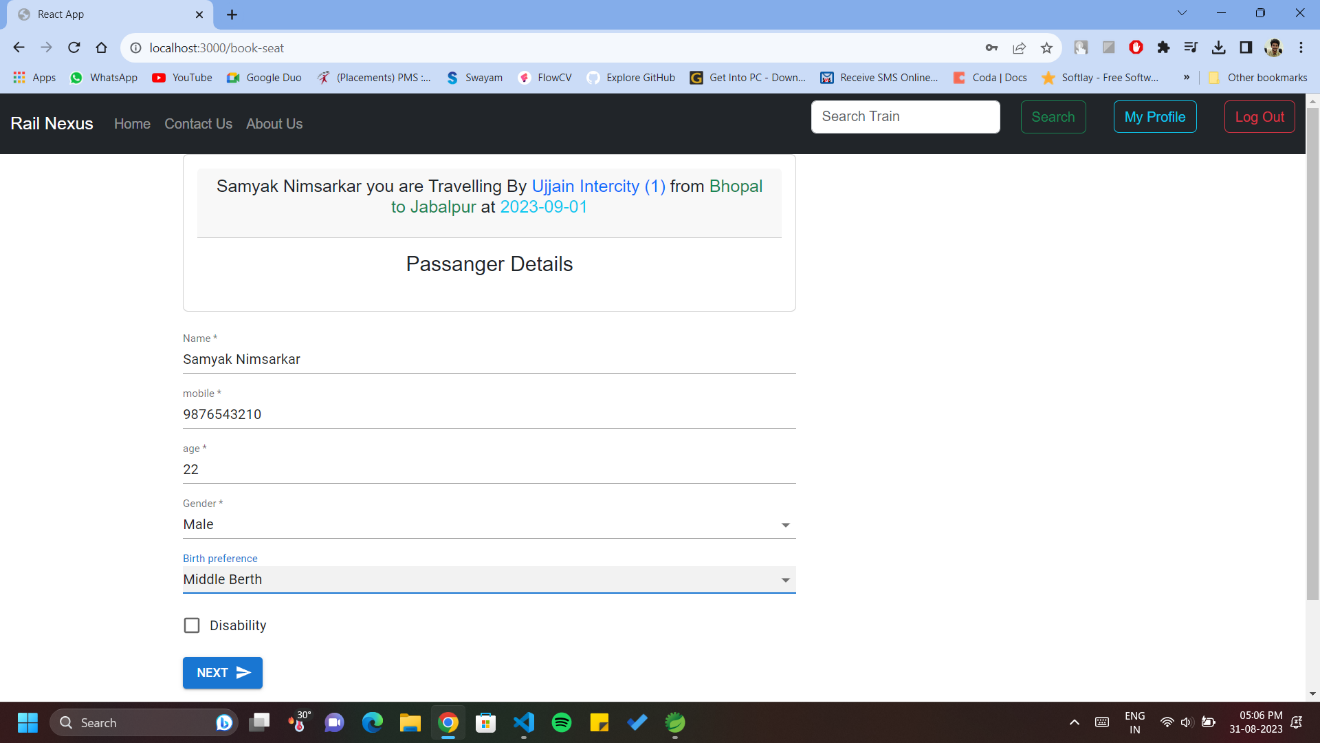
1. **Train Available:**



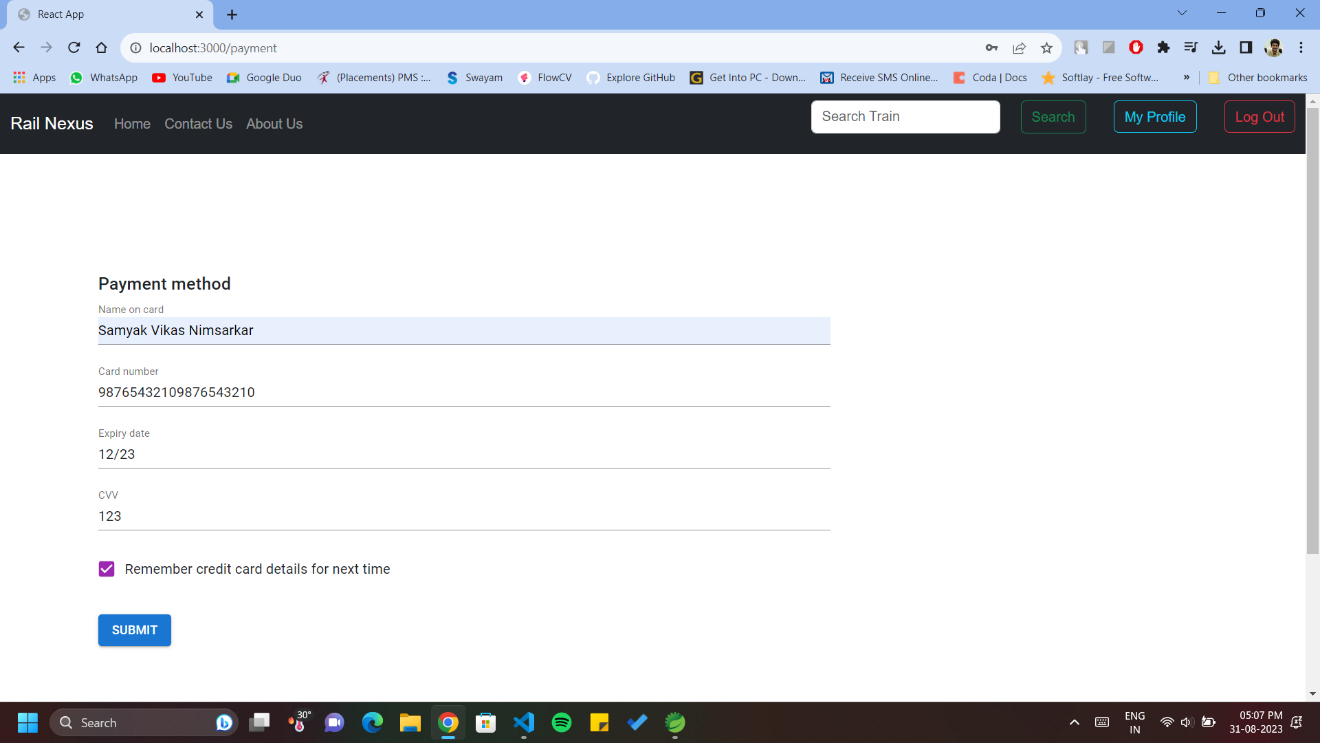
1. **Show Seats:**



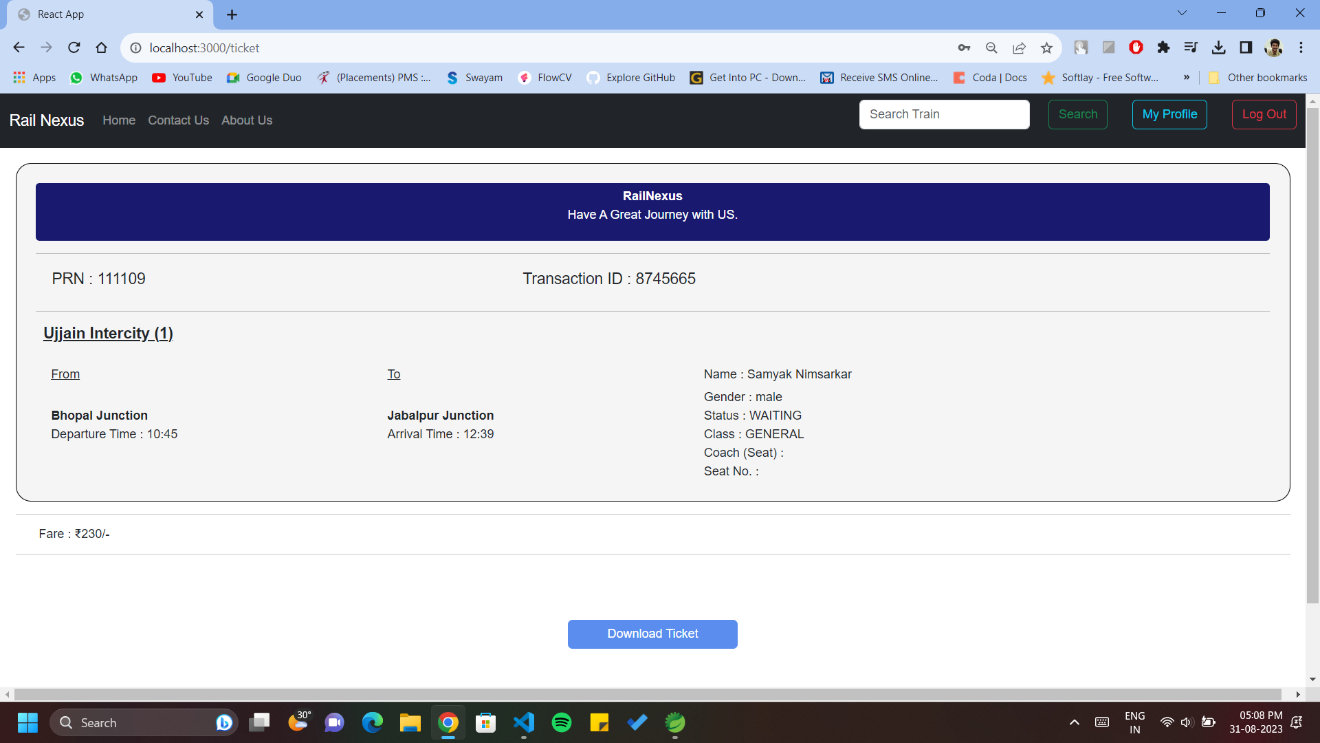
1. **Passenger Details:**



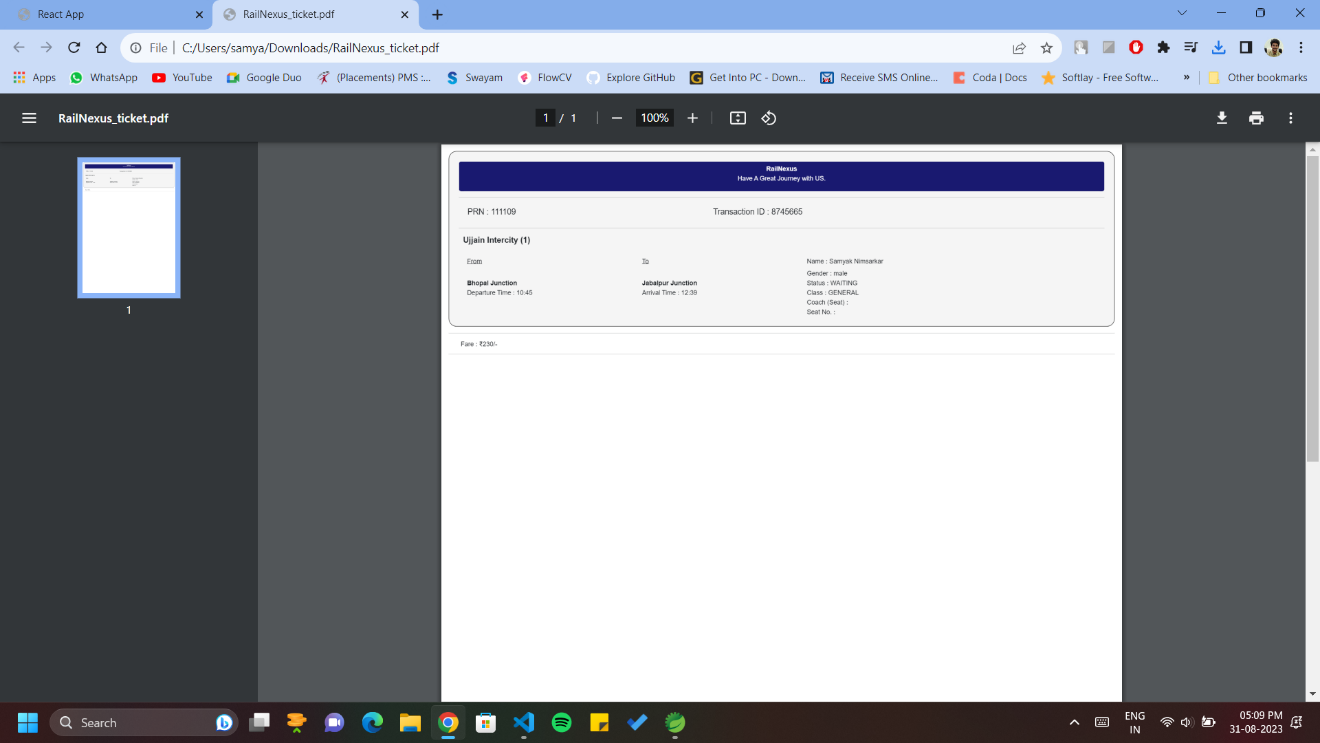
1. **Payment Page:**



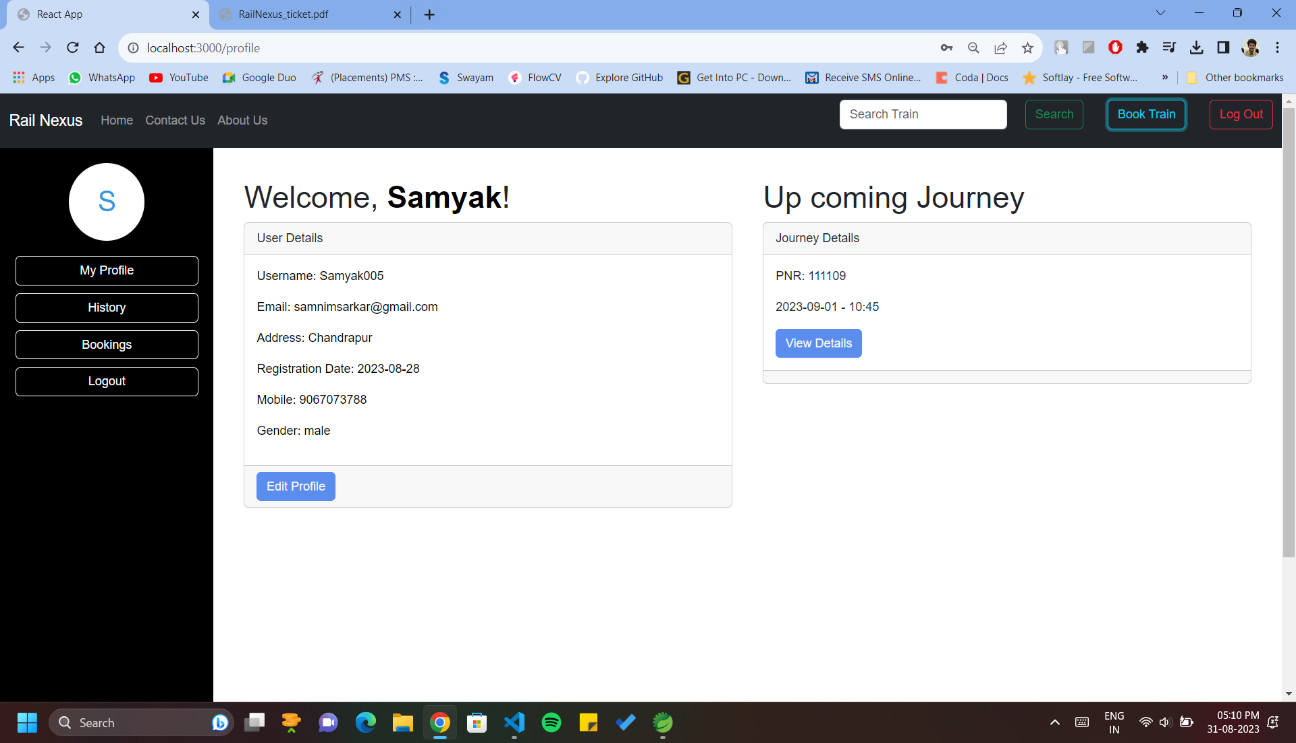
1. **Ticket Page:**



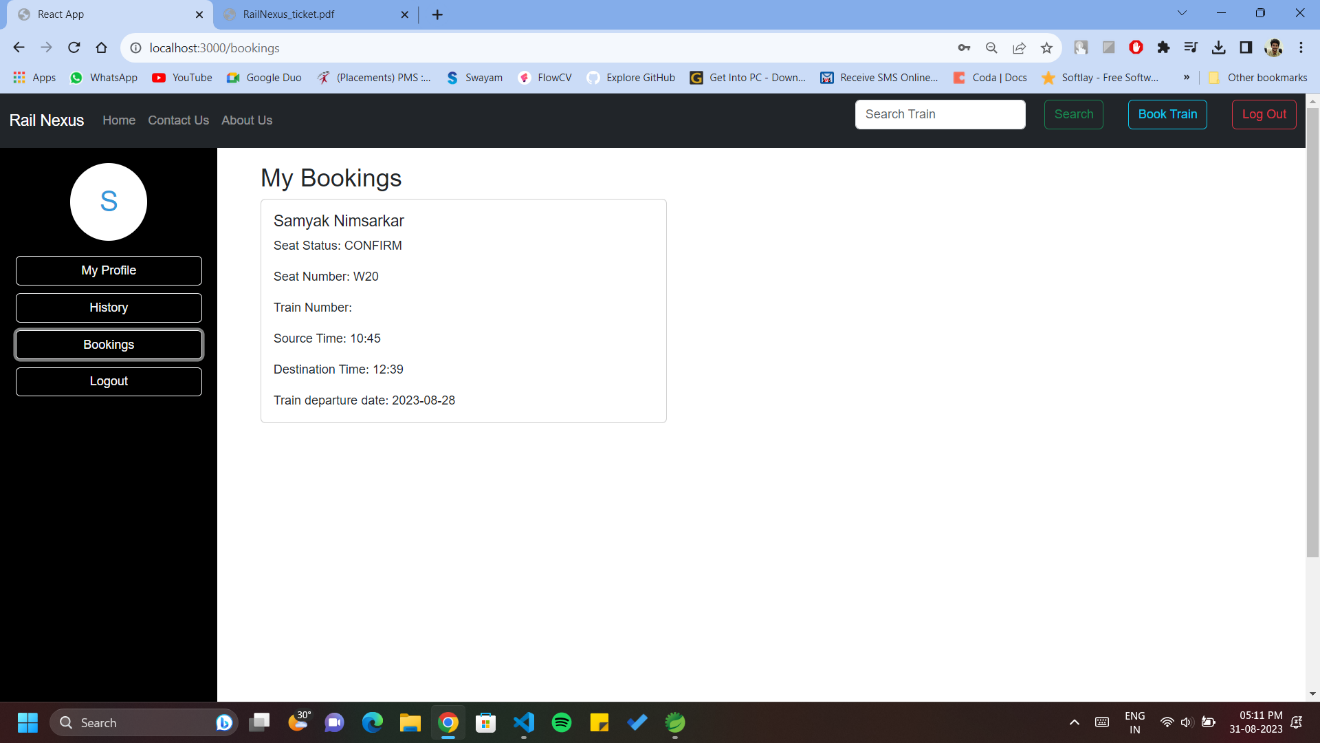
1. **Ticket:**



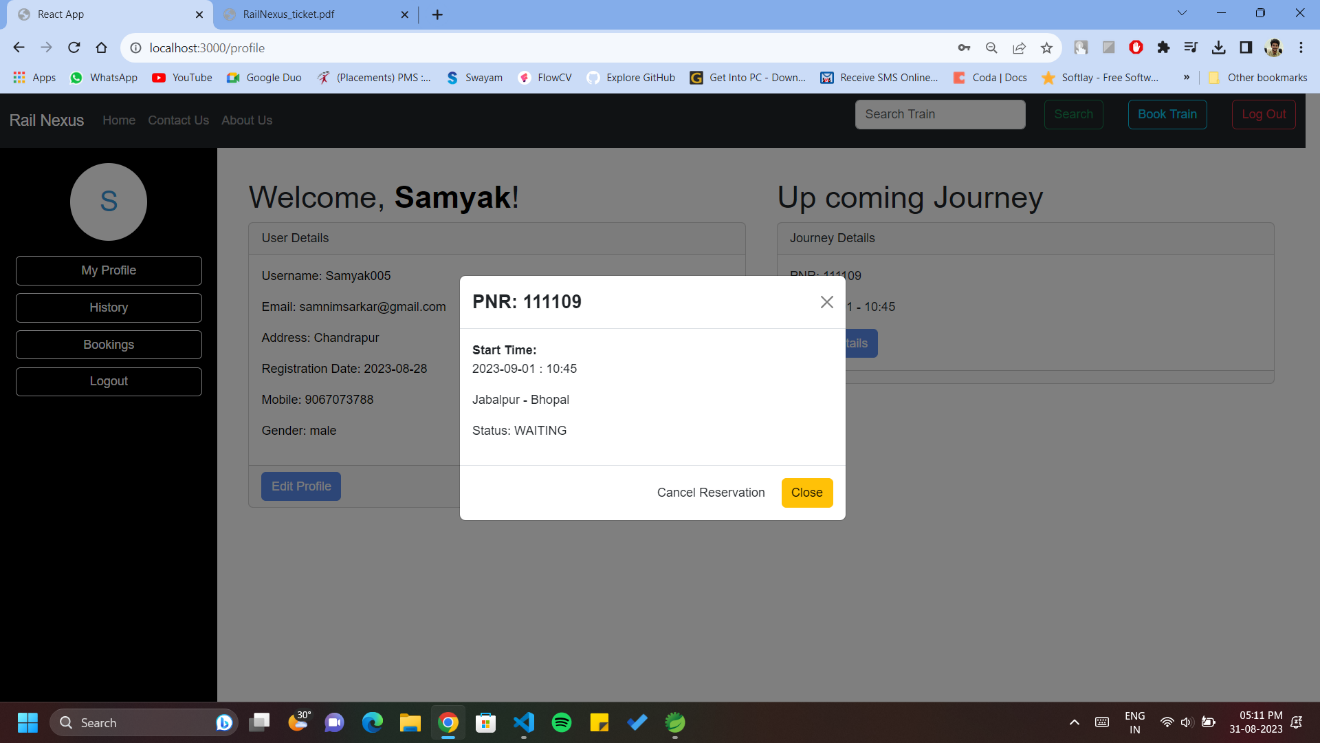
1. **My Profile:**



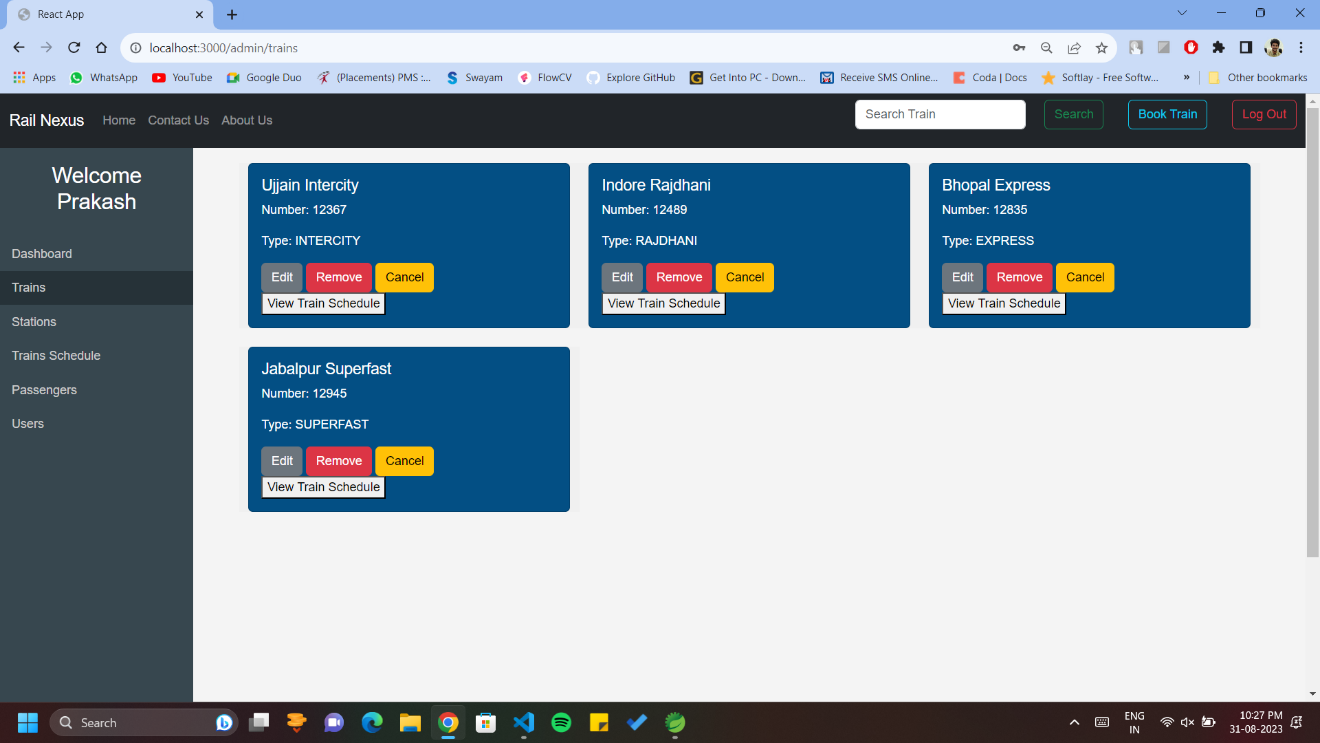
**11) Bookings:**



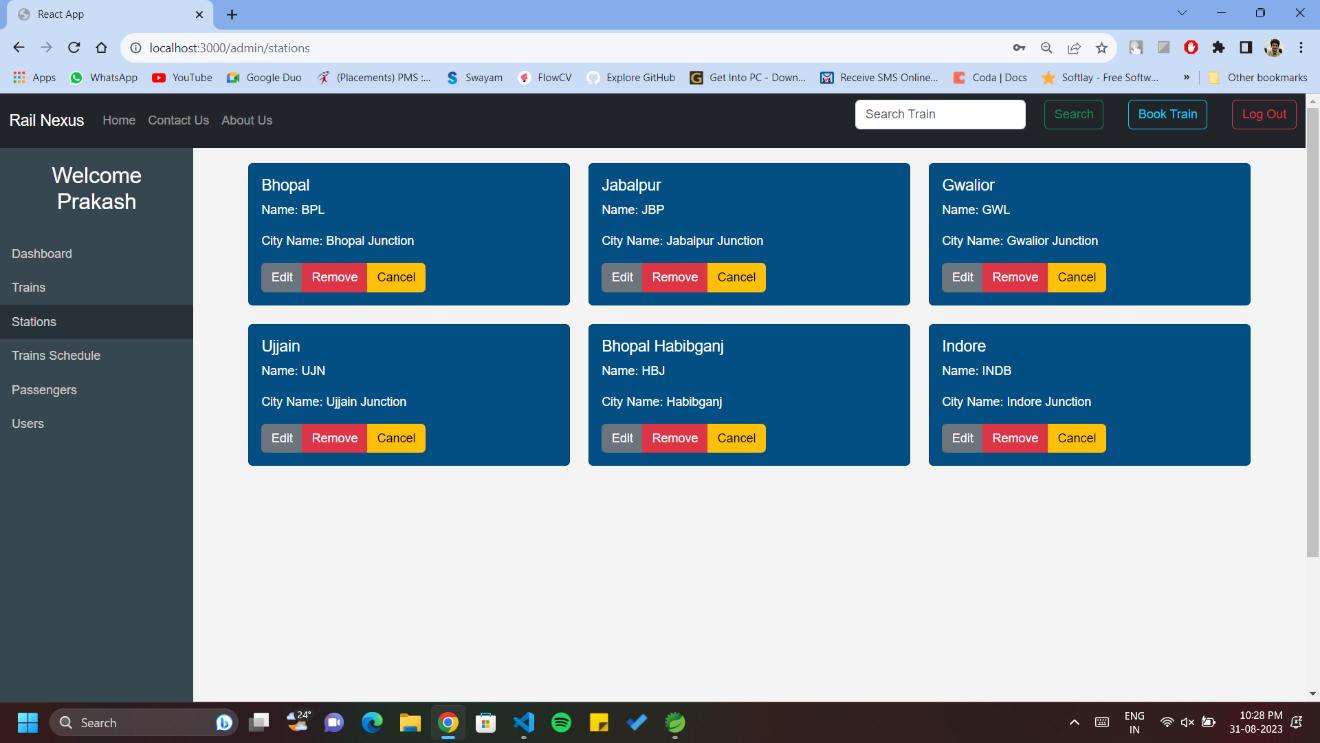
**12) Upcoming Journey:**



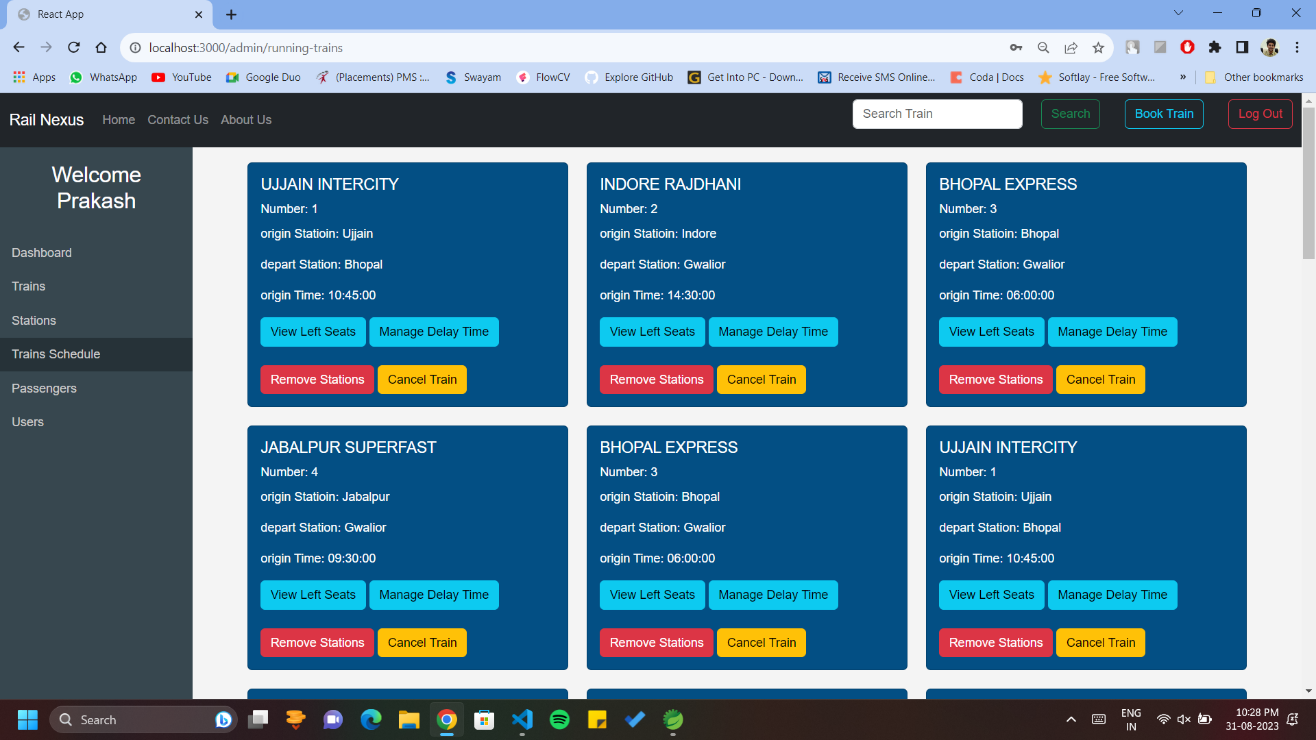
**13) Admin Dashboard (Trains List):**

****

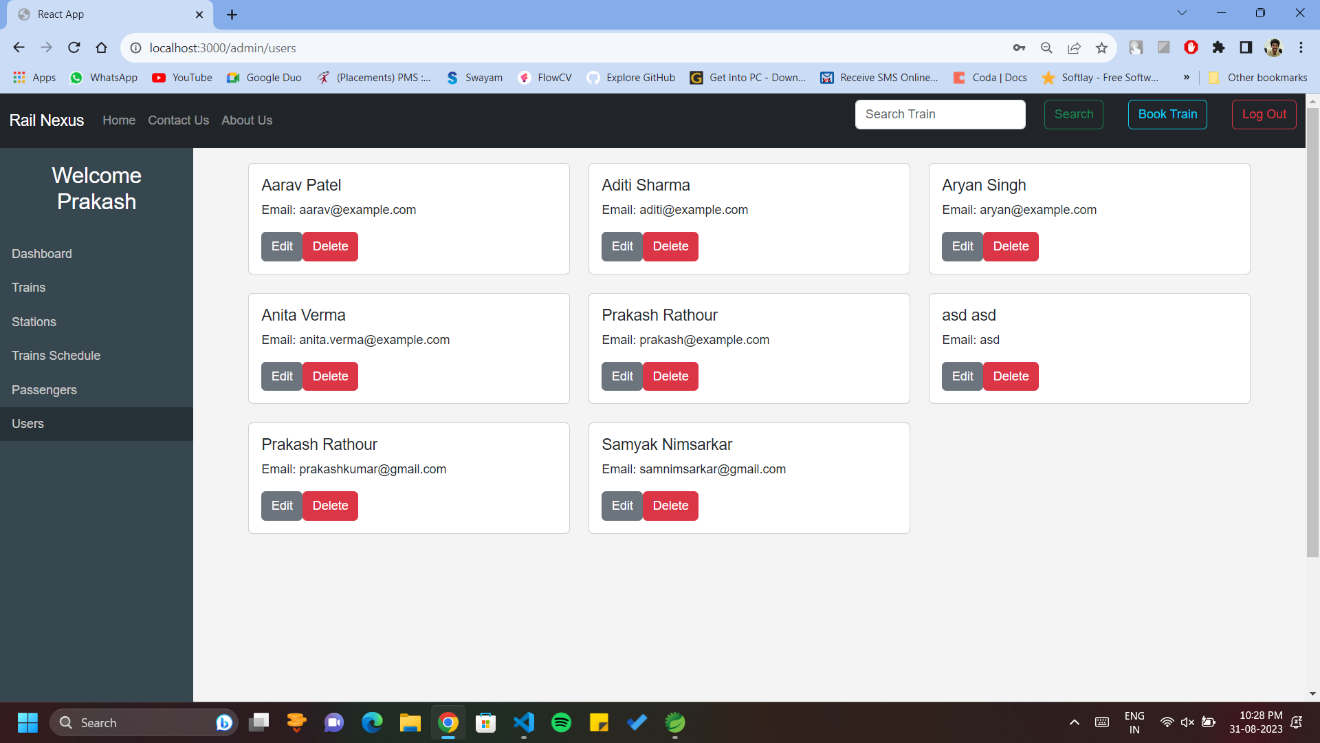
**14) Admin Dashboard (Stations List):**

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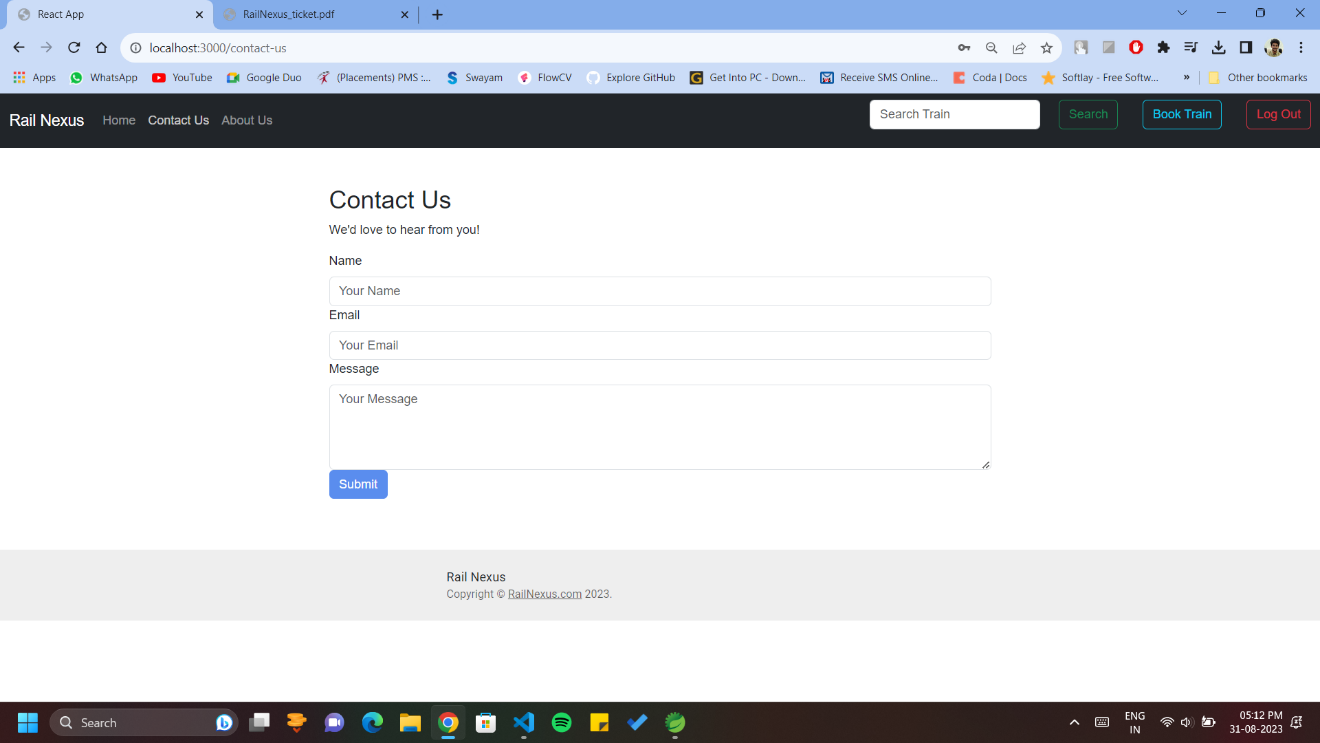
**15) Admin Dashboard (Scheduled Trains):**

****

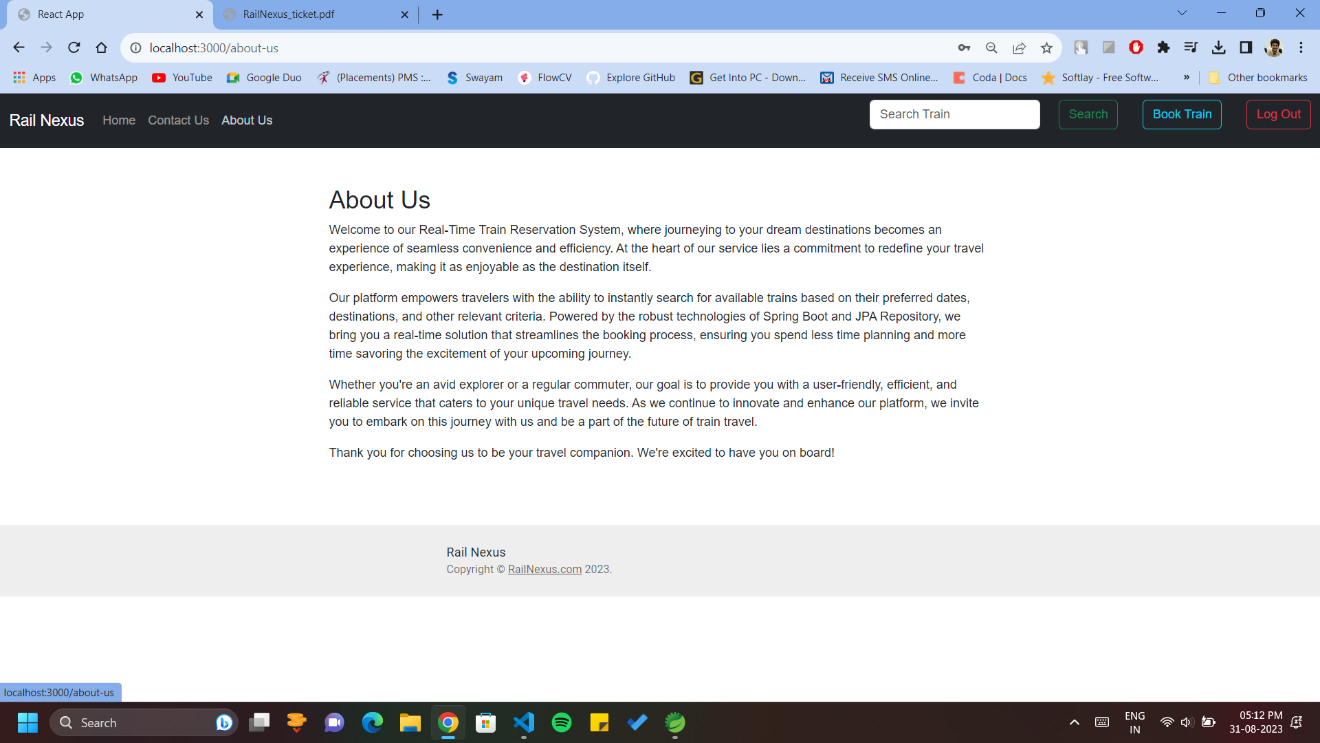
**16) Admin Dashboard (Users):**

****

**17) Contact Us:**



**18) About Us:**



**………………………………………………………………………………………………**

**8. REFERENCES:**

<http://www.google.com>

[http://](http://www.xml101.com:8081/xml/)www.irctc.com

http://www.webdevelopersjournal.com/

http://www.lufthansa.com

http://www.w3.org

http://www.wikipedia.org

http://www.delta.com

http://www.priceline.com