Railway Management System

April 20, 2024

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Contents

1 Functionalities

1.1 User Login/Sign Up

- "User Login" allows existing users(their details must exist in credentials_user.csv) to log in with their username and password. If the inputted details don't exist, the user is redirected to the previous page.

- "User Sign Up" enables new users to create an account by providing their name, age, gender, date of birth, phone number, username, and password. After signing up the users are redirected to the previous page.

1.1.1 Book Ticket

- After logging in, "Book Ticket" allows users to book train tickets. The user is prompted to enter their desired start and end destinations, and the system then shortlists and displays the suitable train options that match the provided route.

- The user can then choose one of the trains, specify personal details (name, phone number, email id, and age), select food options(veg/non-veg/none), choose the class(1A, 2A, 3A, CC), and enter the number of tickets they want to book.

- If sufficient seats are available in that class, then the booking is confirmed, and the details are saved in bookings.csv.

- Else the user is informed that enough seats are not available and is redirected to the main page.

1.1.2 Cancel ticket

- "Cancel ticket" enables users to completely or partially cancel their bookings by providing their phone number, email ID, and train number.

- If a matching booking exists, users can specify the number of tickets to cancel. The system updates the bookings.csv and trains.csv accordingly and calculates the refund amount(60% of the price of the canceled tickets). Else the user is informed that such a booking doesn't exist and is redirected to the main page.

1.1.3 View my booking details

- Users can view details of their booked tickets by providing their phone number, email, and train number.

- If a booking matches the provided details, the system displays the booking information, including train number, name, phone, email, age, food choice, class, total cost, departure time, and estimated arrival time. Else the user is notified that such a booking doesn't exist and is redirected to the main page.

1.2 Admin login

Admin Login" allows administrators to log in with their fixed admin username and password which are authenticated using data from credentials_admin.csv. Admin has no sign up option as all admins are fixed and accounted for.

1.2.1 View trains

Admins can view the details of all trains from trains.csv, including their numbers, names, start and end destinations, total seats, remaining seats, and ticket cost for each class(1A, 2A, 3A, CC), and the departure time and estimated time of arrival.

1.2.2 View bookings

Admins can view details of all bookings from bookings.csv, including train number, user name, phone, email, age, food choice, class, total cost, departure time, and estimated time of arrival.

1.2.3 Add train

Admins can add new trains to trains.csv by providing the train number, train name, start and end destinations, total seats, remaining seats, and prices for each different class(1A, 2A, 3A, CC).

1.2.4 Delete train

Admins can delete existing trains from the system by specifying the train number. If the train number is found in trains.csv, the system removes the train and its associated details from the database.

2 System Design

The system architecture of the Railway Management System is designed to be modular and scalable, allowing for easy integration of new features and enhancements. Detailed diagrams, including use case diagrams and class diagrams, were created to visualize the structure of the system.

3 Implementation

The implementation phase involved translating the design specifications into executable code. The code was organized into logical modules, each responsible for specific functionalities such as user authentication, ticket booking, and administrative tasks. The required and generated data was accessed, stored, and modified in csv files.

4 Future additions

- Integration of online payment methods to facilitate smoother and easier transactions.

- Implementation of a graphical user interface to make the system more interactive and easy to use

- Incorporation of specific features such as seat location diagrams to enable users to select specific seats(eg: window seats) in specific coaches, live updates about the train's progress in the journey, etc.

5 Conclusion

Rail Pal is a perfect platform for train bookings, cancellations, viewing, and special admin access, all of which are authenticated by a password-protected login interface. With its robust functionalities and ease of use, it aims to enhance all the user experiences before, during and after their train journeys.