ONLINE RAILWAY RESERVATION SYSTEM

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INTRODUCTION

The Railway Reservation System serves as an advanced platform enabling passengers to inquire about train availability based on their specified source and destination, facilitating the seamless booking of tickets. This project is designed to create and manage a comprehensive database containing records of diverse trains, their statuses, and passenger details. By automating the reservation process, the system ensures error-free, secure, reliable, and swift seat management.

Online reservation functionality has revolutionized the seat reservation process, offering unprecedented convenience to users. The Railway Reservation System efficiently keeps track of bookings, freeing users to focus on other activities. The project's administrator has the capability to input new train details, view all existing train records, make modifications to train information, and remove outdated train records.

Each train record encompasses essential details such as its name, number, departure and arrival stations, schedule, available seats, and fare. This system streamlines the entire reservation process, enhancing user experience and contributing to a more efficient and organized railway management system.

ACKNOWLEDGEMENT

We would like to extend our sincere appreciation to the individuals who played a pivotal role in the successful culmination of our Railway Reservation System Database Management System (DBMS) project.

Foremost among these individuals is Mrs. Jomina, our esteemed project guide . We express our heartfelt thanks for his invaluable guidance, unwavering support, and insightful feedback throughout the project's development. Mrs. Jomina's expertise and encouragement have played a crucial role in transforming our ideas into a fully functional and efficient system.

Our gratitude also goes out to Ms. Renu ,Ms. Uma and Mr. Steve, dedicated faculty members who provided us with valuable insights, constructive criticism, and continuous encouragement at various stages of the project. Their commitment to teaching and mentoring has significantly enriched our learning experience.

We extend our thanks to the entire faculty of the department for fostering an environment that promotes exploration and innovation. The resources and facilities provided by the institution were instrumental in the successful implementation of our project.

Finally, a heartfelt acknowledgment goes to our classmates and friends who offered their unwavering support and encouragement throughout the project. Their collaboration has been an essential part of this journey.

We express our gratitude to everyone involved for their contributions to the successful completion of our project.

Sincerely,

Nayana V Reji,Neethu Anil Jacob,Nikita Alex,Niranjan G Das

Rajagiri School of Engineering and Technology

Date: 27/12/2023

PROBLEM DEFINITION

This system aims to revolutionize the way users book and manage train tickets, providing a user-friendly, efficient, and secure platform. It aims to create an online railway reservation system which involves solving several key problems to build a robust and functional system like:

Database Design:

- Tables for trains,users, bookings, and other entities need to be created with appropriate relationships and constraints to ensure data integrity and efficient querying.

User Interface Development:

- To allow users to search for trains, view schedules, select seats, enter travel details, and make reservations.

User Authentication and Security:

- Implementing a secure authentication system for user login and registration to ensure data privacy and prevent unauthorized access.

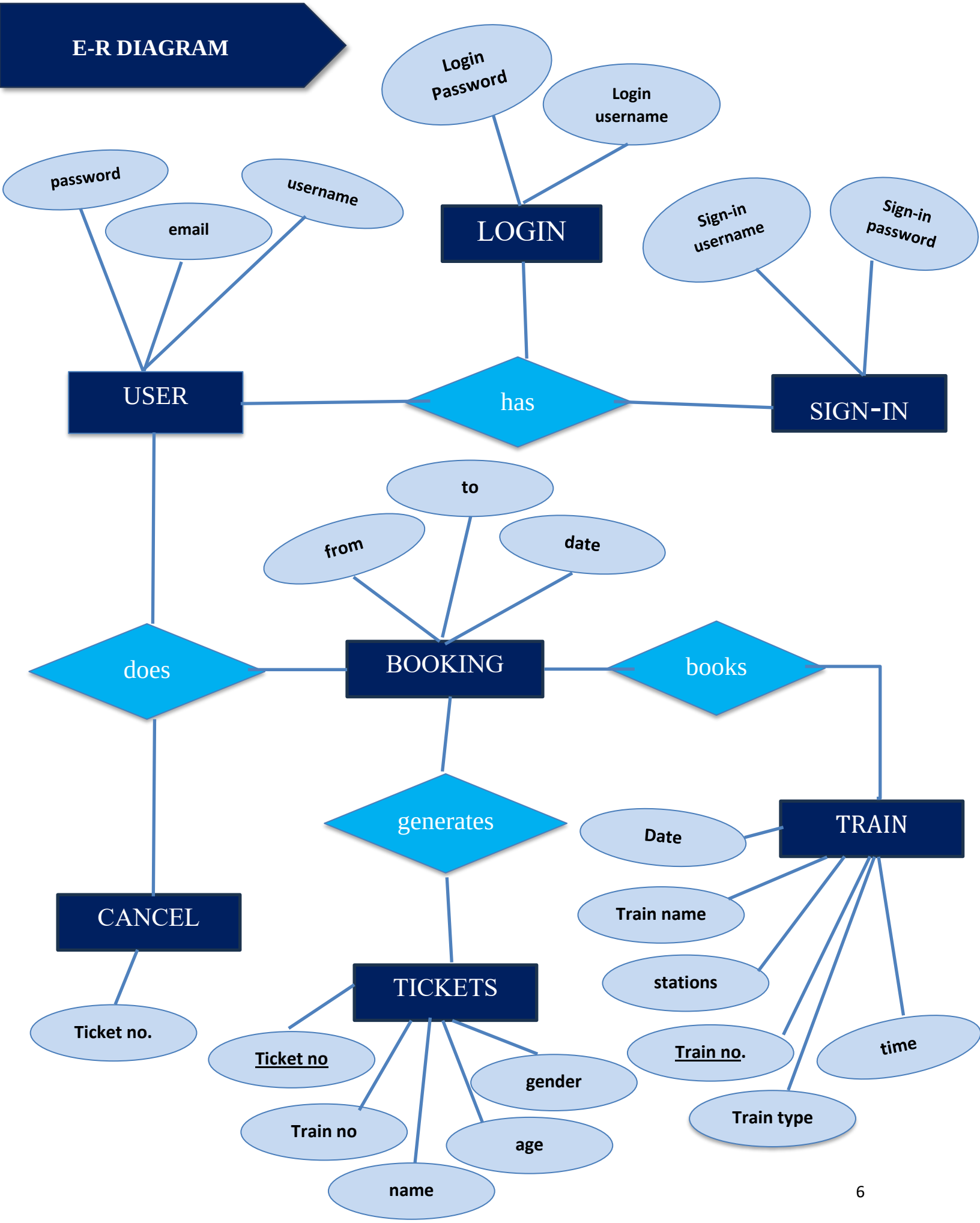
Seat Availibility and Reservation Management:

- Developing algorithms to check seat availability based on travel dates, train routes, and class preferences.
- Managing reservations by updating seat availability in real-time, preventing overbooking, and ensuring accurate availability information.

Booking and Cancellation:

- Implementing functionalities to facilitate the booking process, allowing users to select trains and seats.
- Allowing users to cancel reservations while adhering to cancellation policies and updating seat availability accordingly.

E-R DIAGRAM


Login Password
Login username
LOGIN
password
email
username
Sign-in username
Sign-in password
USER
has
SIGN-IN
to
from
date
does
BOOKING
books
generates
TRAIN
Date
Train name
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Train no.
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Train type
CANCEL
TICKETS
Ticket no.
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gender
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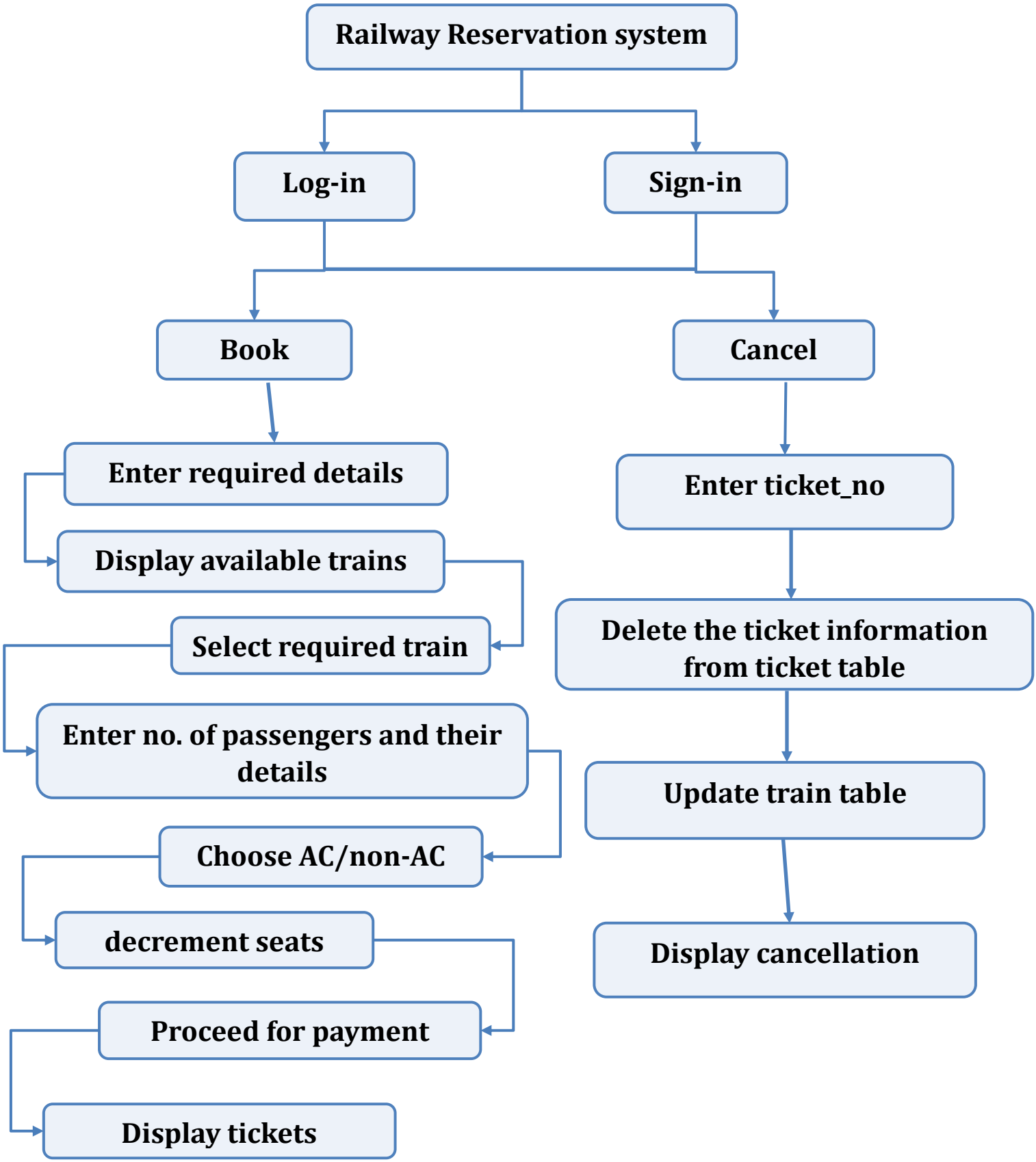
age
name

BLOCK DIAGRAM



FUNCTIONALITY ACHIEVED

1. **User Authentication:**
    - **Login:**
        - Enable existing users to log in securely with their credentials, providing a straightforward and reliable authentication process..
    - **Signup:**
        - Create a smooth onboarding process for new users to register by filling in essential details like name, email, and creating a secure password.
2. **Ticket Booking:**
    - **Search Trains:**
        - Develop an intuitive search interface allowing users to find trains based on various criteria such as origin, destination, date, time, and class preferences.
        - Real-time availability updates to provide users with accurate information.
    - **Select Ticket:**
        - Present a user-friendly interface displaying available ticket options (seats, classes) and fare details.
        - Enable users to select their preferred seats or berths and proceed with the booking.
    - **Booking Confirmation:**
        - Generate a detailed ticket with essential journey information (train details,seat numbers,departure time) upon successful booking.
3. **Ticket Cancellation:**
    - **Cancel Booking:**
        - Provide a user-friendly option to cancel booked tickets within the stipulated cancellation period.
    - **Refund Process:**
        - Automate the refund process in accordance with cancellation policies, ensuring timely refunds to eligible users.

FRONT END SPECIFICATION

Tkinter is a standard GUI (Graphical User Interface) toolkit that comes with Python. It provides a set of tools and widgets to help developers create desktop applications with graphical interfaces.Tkinter provides various pre-built widgets like Label, Button, Entry, Canvas, Frame, etc. They are used to create elements like buttons, text boxes, labels, and more.Tkinter uses geometry managers (pack, grid, place) to organize and arrange widgets within the window.Tkinter follows an event-driven programming model. Actions, such as button clicks or key presses, generate events.Developers define functions (event handlers) to respond to these events.Widgets can be associated with events using the command parameter or the bind method.Every Tkinter application must have a main event loop.The main loop listens for events (user interactions, system events) and dispatches them to the appropriate event handlers.Toplevel widgets are separate, standalone windows in Tkinter.Frame widgets are containers used to group and organize other widgets.Common configuration options include text, bg (background color), fg (foreground color), font, and more.

BACK END SPECIFICATION

MySQL is an open-source relational database management system (RDBMS) which is used to store and manage structured data.It allows you to define tables with relationships, ensuring data integrity and consistency. A relational database organizes data into one or more data tables in which data may be related to each other; these relations help structure the data.MySQL uses SQL for querying and manipulating data. SQL(Structured Query Language) is a powerful language that enables developers to perform operations like SELECT, INSERT, UPDATE, DELETE, and more.MySQL serves as a persistent storage solution for the backend, storing structured data in tables.MySQL is the backbone of the backend system, providing a reliable and scalable storage solution for structured data.

Python and MySQL were connected by importing mysql.connector and this connectivity was used to insert and update,delete and retrieve data from tables in MySQL according to the requirements of the user received through the frontend implemented using Tkinter.

OUTPUT SCREENSHOTS

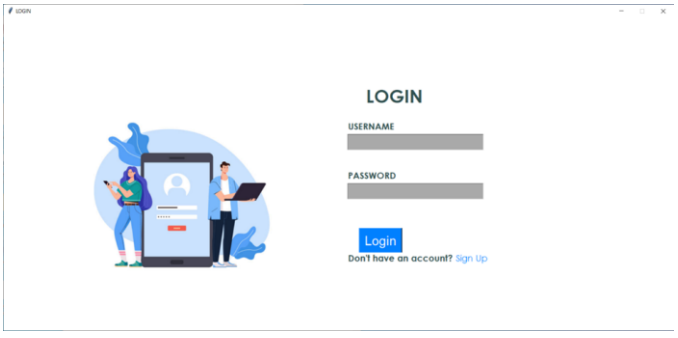
INITIAL DATA IN DATABASE RAILWAY_RESERVATION_SYSTEM:

```
mysql> select * from train3;
+----------+--------------------+-----------------+---------------+-----------------------------------------------------------------------------------------+------------+------------+-------+----------+---------+
| TRAIN_NO | TRAIN_NAME         | FROM_PLACE      | TO_PLACE      | STATIONS                                                                                | TRAIN_DATE | TRAIN_TIME | AM_PM | CHAIR_CAR | SLEEPER |
+----------+--------------------+-----------------+---------------+-----------------------------------------------------------------------------------------+------------+------------+-------+----------+---------+
|    10341 | MALABAR EXPRESS    | Tiruvananthapuram | Karnataka   | Thrissur,Aluva,Kollam,Kasargod,Kozhikode,Ernakulam,Kottayam,Palakkad                    | 2023-12-20 | 12:00:26   | AM    |        0 |      59 |
|    12341 | GURUVAYUR EXPRESS  | Guruvayur       | Chennai       | Kollam,Kasargod,Kannur,Palakkad,Dindigal,Kayamkulam                                     | 2023-12-20 | 03:30:26   | PM    |       68 |       0 |
|    12431 | TVM RAJDHANI EXPRESS | Tiruvananthapuram | New Delhi   | Kollam,Kozhikode,Kasargod,Ernakulam,Kannur                                              | 2023-12-20 | 12:30:56   | PM    |      497 |       0 |
|    15321 | KERALA EXPRESS     | Tiruvananthapuraum | Mumbai       | Thrissur,Aluva,Kollam,Kasargod,Kozhikode,Ernakulam,Kayamkulam,Tiruvananthapuram         | 2023-12-20 | 08:30:26   | AM    |       49 |       0 |
|    16301 | VENAD EXPRESS      | Shornoor        | Tiruvananthapuram | Thrissur,Aluva,Kottayam,Ernakulam,Kollam,Kayamkulam,Tiruvananthapuram                | 2023-12-20 | 01:30:56   | AM    |        0 |      40 |
+----------+--------------------+-----------------+---------------+-----------------------------------------------------------------------------------------+------------+------------+-------+----------+---------+
5 rows in set (0.00 sec)
```

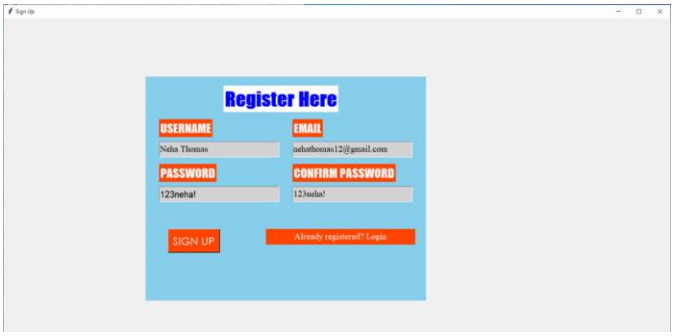
```
mysql> select * from user;
+----------+----------+
| username | password |
+----------+----------+
| Nayana   | 22@naya  |
| Neethu   | 33@neet  |
| Nikita   | 11@niki  |
| Niranjan | 44@gdas  |
| Uma      | 1234     |
+----------+----------+
5 rows in set (0.00 sec)

mysql> select * from ticket;
+-----------+----------+----------+------+--------+
| ticket_no | train_no | name     | age  | gender |
+-----------+----------+----------+------+--------+
|      3168 |    12341 | Nikita   | 20   | Female |
|      5322 |    12431 | Niranjan | 20   | Male   |
|      6478 |    12431 | Nayana   | 20   | Female |
|      7161 |    12431 | Neethu   | 20   | Female |
+-----------+----------+----------+------+--------+
4 rows in set (0.00 sec)
```

HOME SCREEN:



SIGN UP WINDOW:



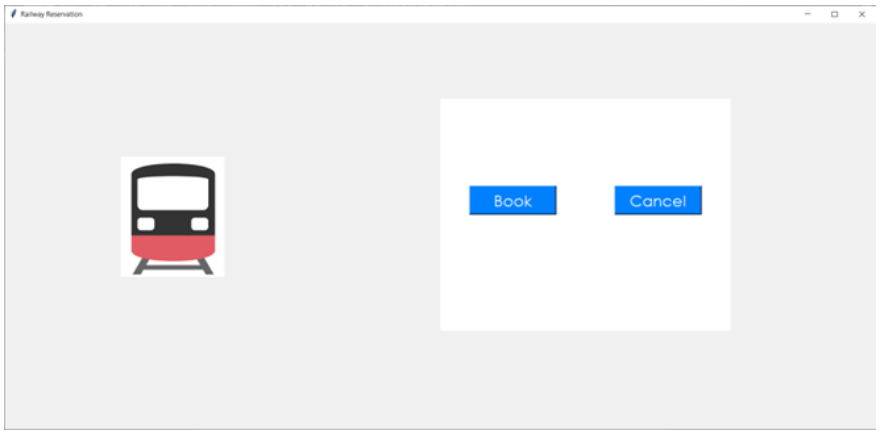
AFTER SIGNUP

THE USER TABLE BECOMES:

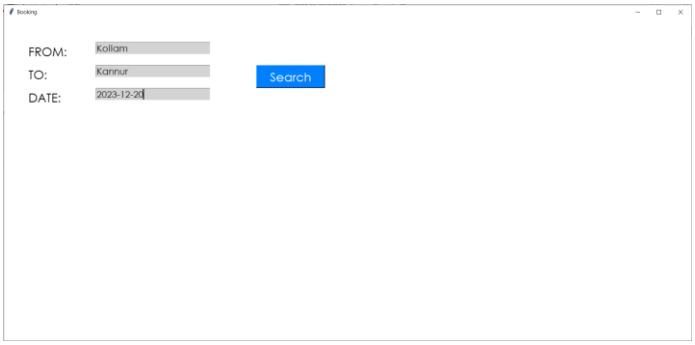
```
mysql> select * from user;
+-------------+----------+
| username    | password |
+-------------+----------+
| Nayana      | 22@naya  |
| Neethu      | 33@neet  |
| Neha Thomas | 123neha! |
| Nikita      | 11@niki  |
| Niranjan    | 44@gdas  |
| Uma         | 1234     |
+-------------+----------+
6 rows in set (0.00 sec)

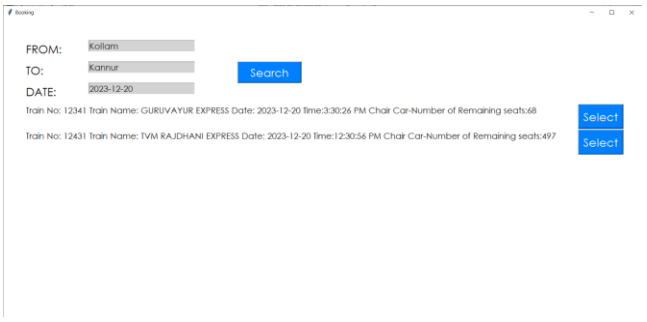
mysql>
```

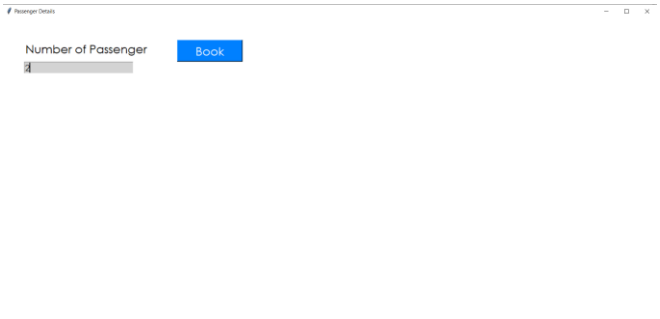
OPTIONS WINDOW:

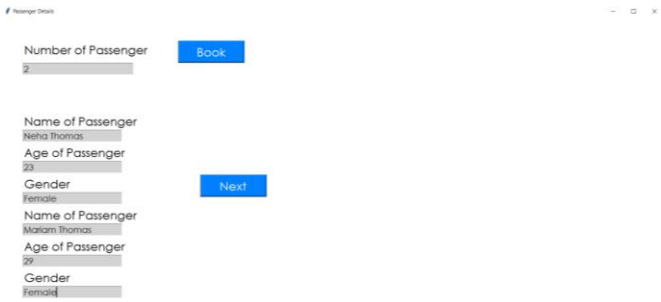


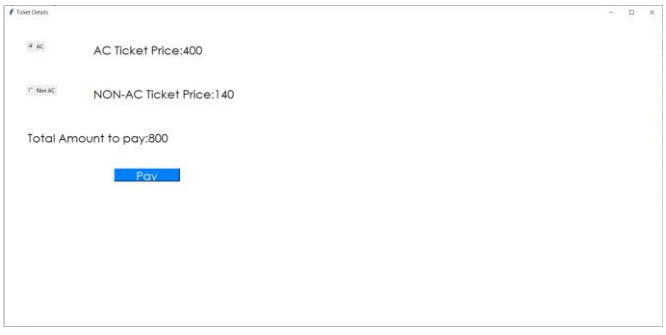
BOOKING WINDOW:

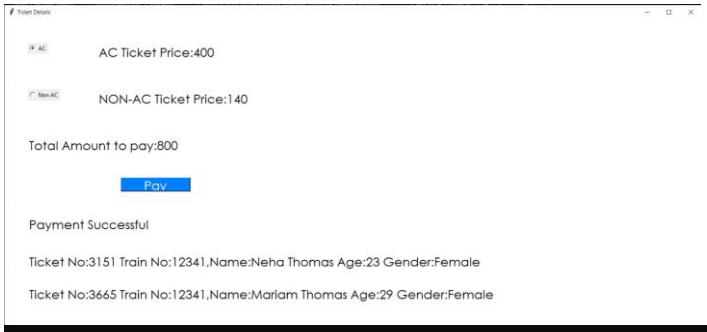













```
mysql> select * from ticket;
+-----------+----------+--------------+------+--------+
| ticket_no | train_no | name         | age  | gender |
+-----------+----------+--------------+------+--------+
|      3151 |    12341 | Neha Thomas  | 23   | Female |
|      3168 |    12341 | Nikita       | 20   | Female |
|      3665 |    12341 | Mariam Thomas| 29   | Female |
|      5322 |    12431 | Niranjan     | 20   | Male   |
|      6478 |    12431 | Nayana       | 20   | Female |
|      7161 |    12431 | Neethu       | 20   | Female |
+-----------+----------+--------------+------+--------+
6 rows in set (0.00 sec)

mysql> select * from train3;
+----------+---------------------+-------------------+-----------------+-----------------------------------------------------------------------------------------+------------+------------+-------+-----------+---------+
| TRAIN_NO | TRAIN_NAME          | FROM_PLACE        | TO_PLACE        | STATIONS                                                                                | TRAIN_DATE | TRAIN_TIME | AM_PM | CHAIR_CAR | SLEEPER |
+----------+---------------------+-------------------+-----------------+-----------------------------------------------------------------------------------------+------------+------------+-------+-----------+---------+
|    10341 | MALABAR EXPRESS     | Tiruvananthapuram | Karnataka       | Thrissur,Aluva,Kollam,Kasargod,Kozhikode,Ernakulam,Kottayam,Palakkad                    | 2023-12-20 | 12:00:26   | AM    |         0 |      59 |
|    12341 | GURUVAYUR EXPRESS   | Guruvayur         | Chennai         | Kollam,Kasargod,Kannur,Palakkad,Dindigal,Kayamkulam                                     | 2023-12-20 | 03:30:26   | PM    |        66 |       0 |
|    12431 | TVM RAJDHANI EXPRESS| Tiruvananthapuram | New Delhi       | Kollam,Kozhikode,Kasargod,Ernakulam,Kannur                                              | 2023-12-20 | 12:30:56   | PM    |       497 |       0 |
|    15321 | KERALA EXPRESS      | Tiruvananthapuraum| Mumbai          | Thrissur,Aluva,Kollam,Kasargod,Kozhikode,Ernakulam,Kayamkulam,Tiruvananthapuram         | 2023-12-20 | 08:30:26   | AM    |        49 |       0 |
|    16301 | VENAD EXPRESS       | Shornoor          | Tiruvananthapuram | Thrissur,Aluva,Kottayam,Ernakulam,Kollam,Kayamkulam,Tiruvananthapuram                 | 2023-12-20 | 01:30:56   | AM    |         0 |      40 |
+----------+---------------------+-------------------+-----------------+-----------------------------------------------------------------------------------------+------------+------------+-------+-----------+---------+
5 rows in set (0.00 sec)
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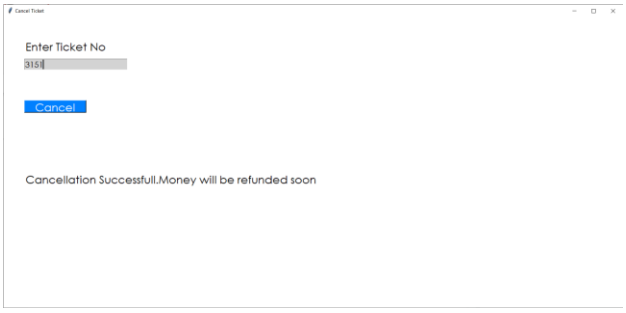
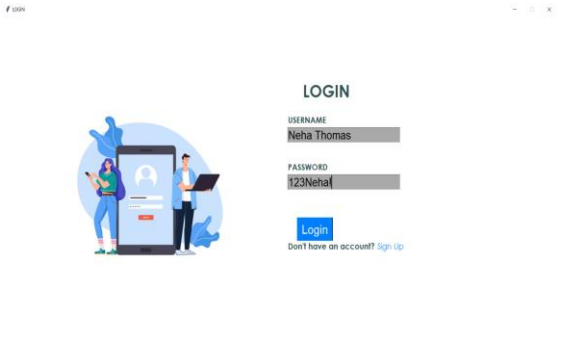
CANCEL WINDOW:

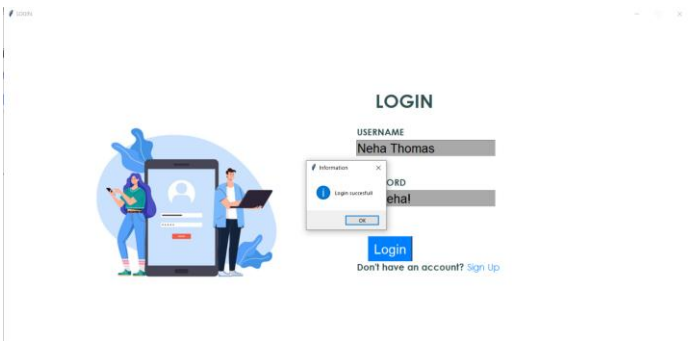



```
mysql> select * from ticket;
+-----------+----------+--------------+------+--------+
| ticket_no | train_no | name         | age  | gender |
+-----------+----------+--------------+------+--------+
|      3168 |    12341 | Nikita       | 20   | Female |
|      3665 |    12341 | Mariam Thomas| 29   | Female |
|      5322 |    12431 | Niranjan     | 20   | Male   |
|      6478 |    12431 | Nayana       | 20   | Female |
|      7161 |    12431 | Neethu       | 20   | Female |
+-----------+----------+--------------+------+--------+
5 rows in set (0.00 sec)

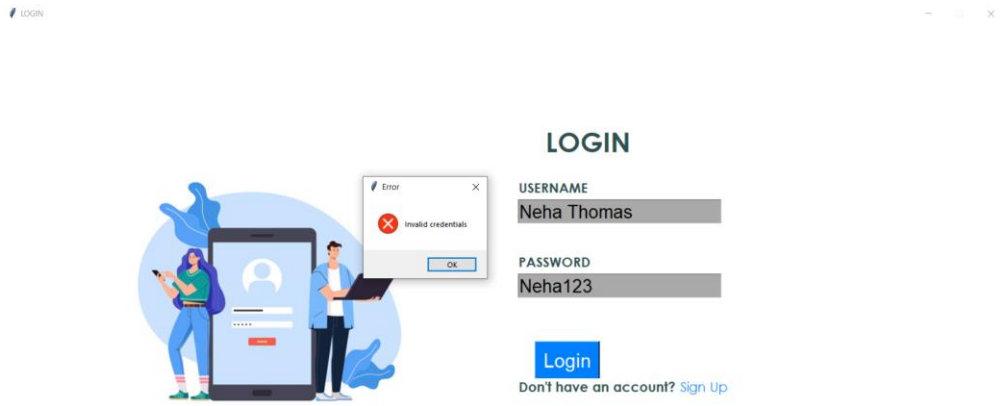
mysql> select * from train3;
+----------+---------------------+-------------------+-----------------+-----------------------------------------------------------------------------------------+------------+------------+-------+-----------+---------+
| TRAIN_NO | TRAIN_NAME          | FROM_PLACE        | TO_PLACE        | STATIONS                                                                                | TRAIN_DATE | TRAIN_TIME | AM_PM | CHAIR_CAR | SLEEPER |
+----------+---------------------+-------------------+-----------------+-----------------------------------------------------------------------------------------+------------+------------+-------+-----------+---------+
|    10341 | MALABAR EXPRESS     | Tiruvananthapuram | Karnataka       | Thrissur,Aluva,Kollam,Kasargod,Kozhikode,Ernakulam,Kottayam,Palakkad                    | 2023-12-20 | 12:00:26   | AM    |         0 |      59 |
|    12341 | GURUVAYUR EXPRESS   | Guruvayur         | Chennai         | Kollam,Kasargod,Kannur,Palakkad,Dindigal,Kayamkulam                                     | 2023-12-20 | 03:30:26   | PM    |        67 |       0 |
|    12431 | TVM RAJDHANI EXPRESS| Tiruvananthapuram | New Delhi       | Kollam,Kozhikode,Kasargod,Ernakulam,Kannur                                              | 2023-12-20 | 12:30:56   | PM    |       497 |       0 |
|    15321 | KERALA EXPRESS      | Tiruvananthapuraum| Mumbai          | Thrissur,Aluva,Kollam,Kasargod,Kozhikode,Ernakulam,Kayamkulam,Tiruvananthapuram         | 2023-12-20 | 08:30:26   | AM    |        49 |       0 |
|    16301 | VENAD EXPRESS       | Shornoor          | Tiruvananthapuram | Thrissur,Aluva,Kottayam,Ernakulam,Kollam,Kayamkulam,Tiruvananthapuram                 | 2023-12-20 | 01:30:56   | AM    |         0 |      40 |
+----------+---------------------+-------------------+-----------------+-----------------------------------------------------------------------------------------+------------+------------+-------+-----------+---------+
5 rows in set (0.00 sec)
```

LOGIN WINDOW:

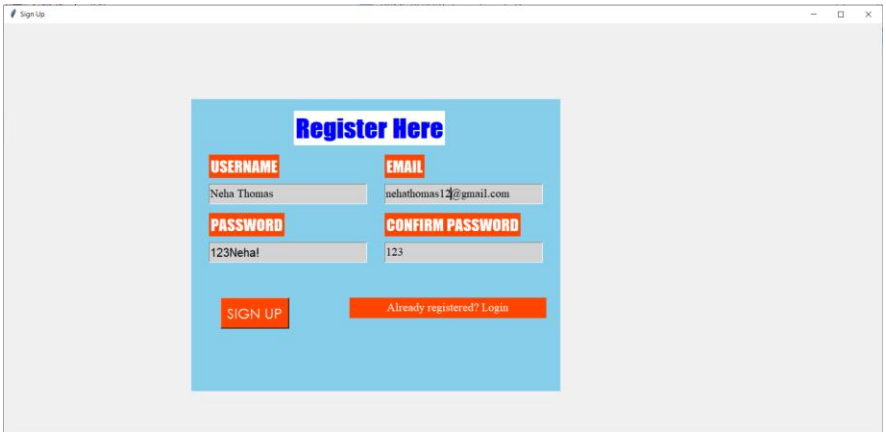


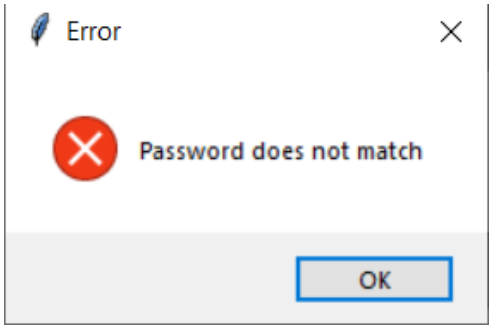


IF LOGIN CREDENTIALS ARE INVALID:

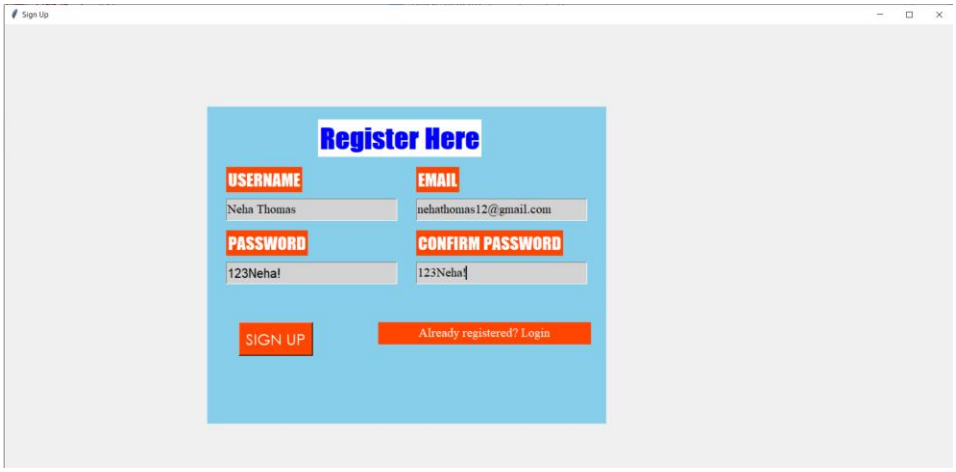


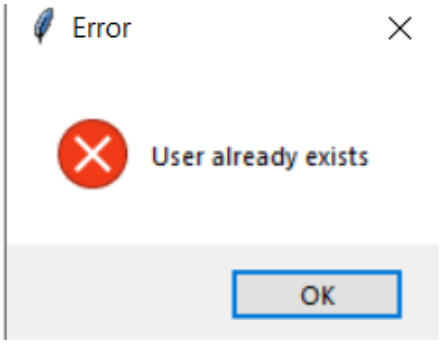
IF PASSWORD DOES NOT MATCH WHILE SIGNUP:





IF USER ALREADY EXISTS:





CONCLUSION

This project Railway reservation System represents an innovative approach to train ticketing solutions. Its user-centric design ensures a reliable, secure, and convenient platform for users to book, manage, and track their train journeys effortlessly. This system allow people to book train tickets easily from whichever place,whenever they want, without having to go or contact the railway system fro each of their queries.

In conclusion, the development of an online railway reservation system using Python and MySQL represents a significant step towards modernizing and streamlining the ticket booking process. This system not only simplifies the booking process for users but also provides administrators with a comprehensive toolset to manage seats and user data securely. This application in future can be upgraded and may become a part of an amazing technology.

REFERENCES

- Geeks for Geeks
  https://www.geeksforgeeks.org/online-railway-ticket-reservation-system/

- IRCTC Rail Connect
  https://www.irctc.co.in/nget/train-search

- W3Schools
  https://www.w3schools.com/

- YouTube