**BUS BOOKING SYSTEM**

**A MINI PROJECT REPORT**

# Submitted By

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In partial fulfillment for the award of the degree of

BACHELOR OF

ENGINEERING IN

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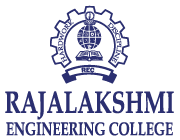


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# BONAFIDE CERTIFICATE

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**ABSTRACT**

This project outlines the development of a bus booking system utilizing Python and MySQL, aimed at enhancing the efficiency and user experience of bus ticket reservations and management. The system is designed to cater to the needs of passengers, bus operators, and administrators by providing an intuitive and reliable platform for booking and managing bus travel.

The bus booking system incorporates several key features, including user registration and login, real-time seat availability checking, secure online payment integration, and automated ticket issuance. For bus operators, the system offers a comprehensive administrative interface to manage bus routes, schedules, and fare structures. Additionally, it includes reporting and analytics tools to help operators optimize their operations based on passenger data and travel trends.

The backend of the system is developed using Python, leveraging its powerful libraries and frameworks to ensure robust functionality and seamless performance. MySQL is used as the database management system to store and manage all data related to users, bookings, bus schedules, and transactions. The combination of Python and MySQL ensures efficient data handling and processing, while maintaining high security standards to protect user information.

The architecture of the system is modular, enabling scalability and ease of maintenance. The user interface is designed to be user-friendly, facilitating a smooth booking process for passengers and straightforward management for operators.

By implementing this Python and MySQL-based bus booking system, we aim to provide a modern, efficient, and secure solution for bus transportation services, improving convenience for passengers and operational efficiency for bus companies. This project showcases the potential of integrating advanced programming and database technologies to revolutionize traditional bus booking systems.

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**CHAPTER 1**

**1.2 INTRODUCTION**

The rapid advancement of technology has significantly transformed various sectors, including the transportation industry. One of the critical areas that have benefited from these advancements is the bus transportation sector. Traditional methods of booking bus tickets, which often involve long queues and manual processes, are increasingly being replaced by more efficient, digital solutions. This project focuses on developing a bus booking system using Python and MySQL, aiming to provide a comprehensive, user-friendly platform for both passengers and bus operators.

The bus booking system is designed to address several key challenges associated with traditional booking methods. These challenges include inefficiencies in managing reservations, difficulty in tracking seat availability, and the lack of a streamlined process for fare management. Additionally, traditional systems often fail to provide real-time updates and are prone to human errors, leading to customer dissatisfaction and operational inefficiencies.

**1.2 OBJECTIVES**

1. **User-Friendly Interface:**

* Design an intuitive and easy-to-navigate interface for users to search for and book bus tickets.
* Provide a seamless user experience across different devices (desktop, tablet, mobile).

1. **Efficient Booking Process:**

* Enable quick and simple bus ticket booking with minimal steps.
* Offer flexible payment options including credit/debit cards, mobile payments, and e-wallets.

1. **Real-Time Information:**

* Provide real-time information on bus availability, schedules, and seat occupancy.
* Offer live updates on bus status, including delays and cancellations.

1. **Comprehensive Search and Filter Options:**

* Allow users to search for buses based on various criteria such as destination, date, time, bus type, and price.
* Include filters for amenities (e.g., Wi-Fi, air conditioning) and seat preference (e.g., window, aisle).

1. **Secure Transactions:**

* Implement robust security measures to protect user data and transaction details.
* Ensure compliance with relevant data protection and payment processing regulations.

1. **Customer Support:**

* Provide 24/7 customer support through multiple channels such as chat, email, and phone.
* Include a comprehensive FAQ section to assist users with common queries.

1. **Booking Management:**

* Allow users to view, manage, and cancel their bookings easily.
* Provide options for modifying travel details and rescheduling tickets.

1. **Notifications and Alerts:**

* Send automated notifications and reminders about upcoming trips, booking confirmations, and changes in schedule.
* Allow users to set personalized alerts for specific routes or travel dates.

1. **Loyalty and Rewards Program:**

* Implement a loyalty program to reward frequent travelers with points, discounts, or other benefits.
* Offer promotional deals and discounts to attract and retain customers.

1. **Comprehensive Reporting and Analytics:**

* Provide detailed reports and analytics for operators to monitor bookings, revenue, and customer preferences.
* Use analytics to improve service quality and operational efficiency.

1. **Integration with Other Services:**

* Integrate with other travel services and platforms (e.g., hotels, car rentals) to offer bundled packages.
* Support integration with popular navigation and map services for route planning and guidance.

1. **Multilingual and Multi-Currency Support:**

* Support multiple languages and currencies to cater to a diverse user base.
* Ensure accurate currency conversion and display of prices.

1. **Accessibility:**

* Ensure the system is accessible to users with disabilities, complying with accessibility standards.
* Provide features such as screen reader support and keyboard navigation.

1. **Environmental Sustainability:**

* Promote eco-friendly travel options and provide information on the environmental impact of different travel choices.
* Encourage paperless transactions and ticketing.

1. **Scalability and Performance:**

* Design the system to handle high traffic volumes and peak booking times without performance degradation.
* Ensure scalability to accommodate future growth and additional features.
  1. MODULES

**User Module**

* **Registration**: Collect user details like name, email, phone number, and password.
* **Login**: Authenticate users based on credentials.
* **Profile Management**: Allow users to view and edit their profile information.
* **Password Recovery**: Facilitate password reset via email or SMS.

**Search and Booking Module**

* **Search Buses**: Filter buses by source, destination, date, time, and other criteria.
* **Seat Selection**: Provide a visual interface for selecting available seats.
* **Booking Confirmation**: Generate booking confirmation with details.
* **Payment Processing**: Securely handle payments and confirm bookings upon successful transactions.

**Admin Module**

* **Bus Management**: Add new buses, update existing bus details, and remove buses from the system.
* **Route Management**: Define and manage bus routes and schedules.
* **User Management**: View and manage registered users.
* **Booking Management**: View, update, or cancel bookings.
* **Reports and Analytics**: Generate and view reports on bookings, sales, user activities, etc.

**Payment Module**:

* Payment Gateway Integration (support for various payment methods like credit/debit cards, net banking, UPI, etc.)
* Transaction Management
* Refund Processing

**Notification Module**:

1. Email Notifications (booking confirmation, cancellations, updates)
2. SMS Notifications
3. Push Notifications (for mobile apps)

**Review and Feedback Module**:

* User Reviews and Ratings for Buses
* Feedback Submission

**Support Module**:

* Customer Support (chat, email, phone support integration)
* FAQ and Help Section

**Reporting Module**:

* Sales Reports
* User Activity Reports
* Bus Performance Reports
* Custom Reports

**Security Module**:

* Data Encryption
* Secure Login (Two-Factor Authentication)
* User Data Protection

**Localization Module**:

* Multi-Language Support
* Multi-Currency Support

**Promotion and Discount Module**:

* Coupon Management
* Discount Offers
* Promotional Campaigns

**CHAPTER 2**

**SURVEY ARE DESCRIPTION**

**2. SOFTWARE DESCRIPTION**

**2.1 Integrated Development Environment: Python**

The system is developed using Python, which offers a wide range of frameworks and tools suitable for web application development. The primary IDE used for development is PyCharm, known for its powerful code editor, debugging capabilities, and seamless integration with various Python libraries and frameworks.

**2.2 Database Management Tool: MySQL**

MySQL Workbench is a unified visual tool designed for database architects, developers, and DBAs. It offers a comprehensive suite of functions to facilitate the design, modeling, generation, and management of MySQL databases. With its intuitive graphical user interface (GUI), MySQL Workbench provides powerful tools for creating and editing database schemas, performing SQL queries, and managing server configurations. Key features include data modeling, SQL development, and server administration, enabling users to visually design databases, execute and optimize queries, and manage MySQL environments effectively.

* 1. **LANGUAGES**

**2.1.1. Primary language: PYTHON**

Python serves as the primary programming language for developing the Bus Booking System project. Its simplicity, readability, and extensive library support make it well-suited for rapid application development. Python facilitates the implementation of various system functionalities, including user interface design, database interaction, and business logic implementation. Python's versatility enables seamless integration with other technologies, allowing for the creation of a robust and scalable bus booking solution.

**2.1.2. Database language: SQL**

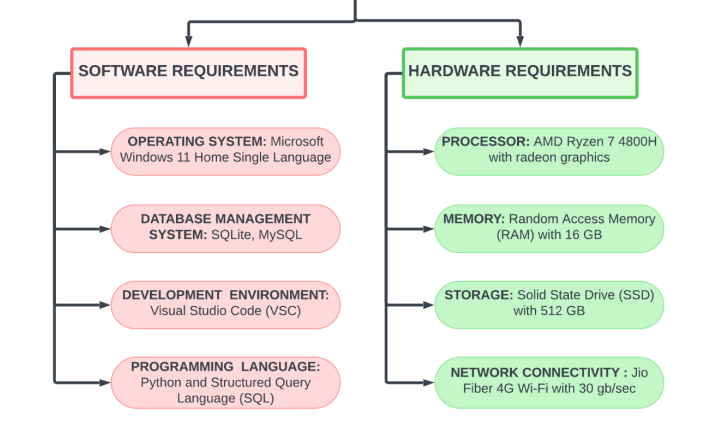
SQL (Structured Query Language) is instrumental in managing the project's database infrastructure. It provides standardized syntax for database operations, facilitating efficient data manipulation, retrieval, and storage. SQL ensures data integrity and reliability within the Bus Booking System (BBS). SQL's capability extends beyond basic data operations, enabling the creation and management of complex database structures, such as tables, indexes, and relationships, essential for organizing bus booking data effectively.

**CHAPTER-3**

**3.1 REQUIREMENT SPECIFICATION**

In this chapter, we delve into the essential functional and non-functional requirements for the successful development and implementation of the Bus booking system The system's requirements are categorized into various aspects, encompassing both software and hardware specifications. This analysis forms the foundational framework for the subsequent phases of the project, ensuring alignment with user needs and industry standard

**Bus Booking System**



**3.1.1. Functionality Requirements**

1. **User Management** The User Management module handles functionalities related to user registration, login, and profile management. It includes:
   * **Registration**: Collect user details for account creation.
   * **Login**: Secure authentication for returning users.
   * **Profile Management**: Allow users to view and update their profile information.
   * **Password Recovery**: Facilitate password reset via email.
2. **Bus Information Management** The Bus Information Management module manages all details about buses, including:
   * **Bus Listing**: Display available buses with details such as seating capacity, amenities, and schedules.
   * **Bus Details**: Provide comprehensive information on each bus, including routes and schedules.
3. **Search and Booking** The Search and Booking module allows users to find and book bus tickets. It includes:
   * **Search Buses**: Filter buses by destination, date, and time.
   * **Seat Availability**: Real-time check for available seats.
   * **Seat Selection**: Visual interface for selecting available seats.
   * **Booking Confirmation**: Generate booking confirmation with details.
4. **Payment Processing** The Payment Processing module handles all financial transactions. It includes:
   * **Payment Gateway Integration**: Support for various payment methods such as credit/debit cards, net banking, and UPI.
   * **Transaction Management**: Secure handling of payments and refunds.
   * **Invoicing**: Generate invoices for completed transactions.
5. **Notifications** The Notifications module ensures users are informed about their bookings. It includes:
   * **Email Notifications**: Automated emails for booking confirmations, cancellations, and updates.
   * **SMS Notifications**: Text messages for booking-related information.
   * **Push Notifications**: Notifications for mobile app users.
6. **Admin Interface** The Admin Interface module provides tools for managing the system. It includes:
   * **Bus Management**: Add, update, and delete bus details.
   * **Route and Schedule Management**: Define and manage routes and schedules.
   * **User and Booking Management**: View and manage user details and bookings.
   * **Reports and Analytics**: Generate reports on bookings, sales, and user activities.
7. **Customer Support** The Customer Support module offers support functionalities to assist users. It includes:
   * **Support Channels**: Chat, email, and phone support integration.
   * **FAQ and Help Section**: Comprehensive help resources.
8. **Reviews and Feedback** The Reviews and Feedback module allows users to share their experiences. It includes:
   * **User Reviews and Ratings**: Collect feedback on bus services.
   * **Feedback Submission**: Enable users to submit their feedback.
9. **Security** The Security module ensures data protection and secure operations. It includes:
   * **Data Encryption**: Protect user data during transmission and storage.
   * **Secure Login**: Implement two-factor authentication.
   * **Access Control**: Define and manage user roles and permissions.
10. **Localization** The Localization module supports multiple languages and currencies. It includes:
    * **Multi-Language Support**: Cater to users speaking different languages.
    * **Multi-Currency Support**: Handle payments in various currencies.
11. **Promotions and Discounts** The Promotions and Discounts module manages promotional activities. It includes:
    * **Coupon Management**: Create and manage discount coupons.
    * **Promotional Campaigns**: Run and manage promotional campaigns.

**3.1.2. Non-Functionality Requirements**

1. **Performance** The system should handle a high volume of users and transactions efficiently, ensuring minimal latency and smooth operation during peak usage.
2. **Reliability** Ensure continuous system availability with mechanisms for redundancy and failover. Implement proactive monitoring for timely issue detection and resolution.
3. **Scalability** The system should scale horizontally and vertically to accommodate growth in user base, data volume, and transaction load without significant performance degradation.
4. **Data Integrity** Maintain data accuracy and consistency with robust validation and error handling mechanisms. Implement encryption and access controls to protect data integrity.
5. **Usability** Design an intuitive and user-friendly interface to accommodate users with varying technical expertise. Ensure clear navigation, consistent design, and customizable interfaces.
6. **Backup and Recovery** Implement regular automated data backups and a comprehensive disaster recovery plan to ensure data preservation and system continuity in case of failures.
7. **Regulatory Compliance** Adhere to relevant data privacy and security regulations (e.g., GDPR, HIPAA) with regular audits and documentation to ensure compliance.

**3.2. Hardware Requirements**

1. **Processor**: AMD Ryzen 7 4800H or equivalent (e.g., Intel Core i5 or AMD Ryzen 5 for smaller datasets).
2. **Memory (RAM)**: 16 GB (8 GB may suffice for smaller datasets).
3. **Storage**: 512 GB SSD for fast read/write speeds (smaller capacity SSDs can be used for limited datasets).
4. **Network Connectivity**: Reliable internet connection (e.g., Jio Fiber 4G Wi-Fi with 30 GB/sec for high user traffic).

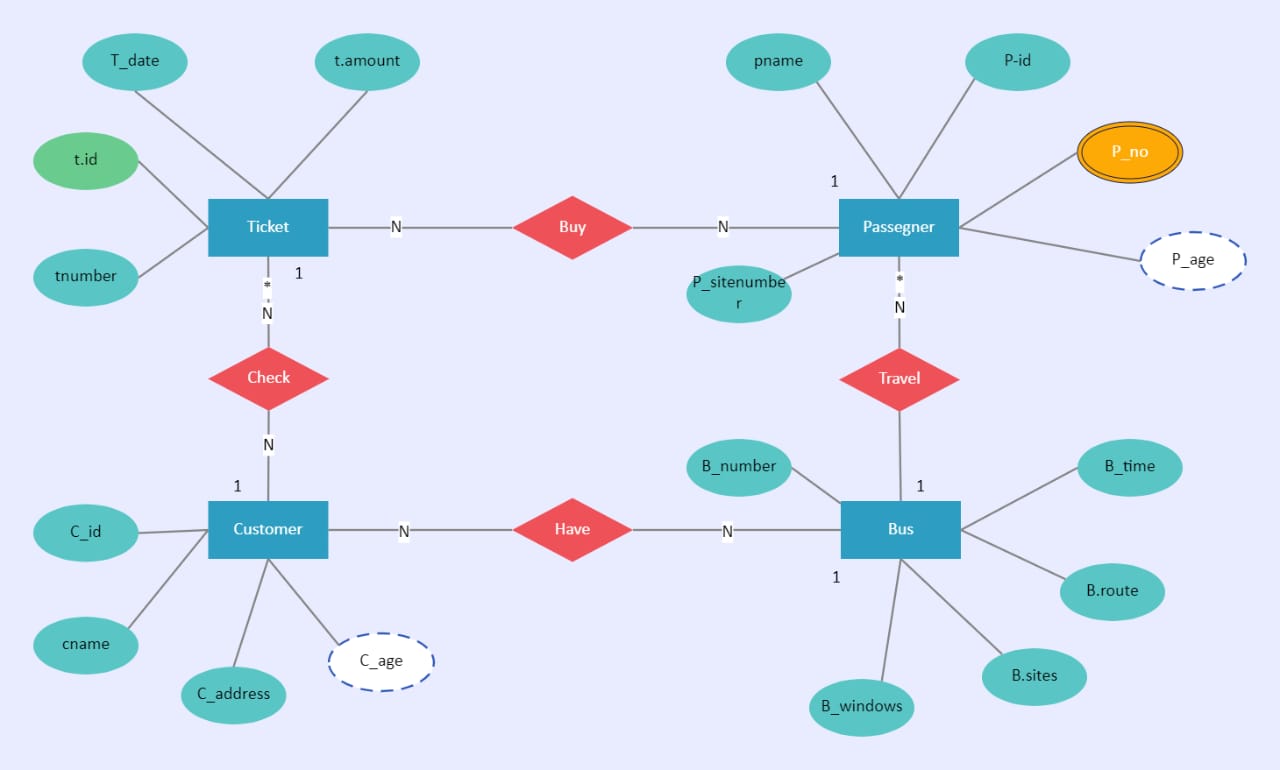
**3.3. Software Requirements**

1. **Operating System (OS)**
   * Compatibility with commonly used operating systems such as Windows 10 or later (64-bit) for flexibility in deployment environments.
2. **Database Management System (DBMS)**
   * Use MySQL for robust data management. SQLite can be used for prototyping and smaller datasets.
3. **Development Environment (IDE)**
   * Visual Studio Code for its versatility, extensive plugin ecosystem, and cross-platform compatibility.
4. **Programming Languages**
   * **Primary Language**: Python for server-side logic, leveraging libraries like Django or Flask.
   * **Secondary Language**: SQL for database interactions and efficient data manipulation.

**3.3 ARCHITECTURE DIAGRAM**

This project implements a secure client-server architecture to optimize access to the bus booking system's central database. Users interact with bus information and booking functionalities through a user-friendly web or mobile application (client). This client communicates with a separate server application that acts as an intermediary. The server processes user requests, translates them into database queries, and retrieves data from the main database (e.g., MySQL). Finally, the retrieved information is delivered back to the user's application for display. This architecture ensures efficient data management and secure access0 for authorized users, streamlining the booking process and enhancing data security measures.

**3.4 ER DIAGRAM**

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**CHAPTER 4**

**PROGRAM CODE**

**4.1. FRONTEND – PYTHON**

import tkinter as tk

from tkinter import messagebox, simpledialog

from tkinter import ttk

import sqlite3

# Database connection

conn = sqlite3.connect('bus\_ticket\_booking.db')

cur = conn.cursor()

# Create users table if it doesn't exist

cur.execute('''

CREATE TABLE IF NOT EXISTS users (

id INTEGER PRIMARY KEY AUTOINCREMENT,

username TEXT UNIQUE,

password TEXT

)

''')

# Create buses table if it doesn't exist

cur.execute('''

CREATE TABLE IF NOT EXISTS buses (

id INTEGER PRIMARY KEY AUTOINCREMENT,

bus\_number TEXT UNIQUE,

seats INTEGER,

driver\_name TEXT

)

''')

# Create routes table if it doesn't exist

cur.execute('''

CREATE TABLE IF NOT EXISTS routes (

id INTEGER PRIMARY KEY AUTOINCREMENT,

route\_name TEXT UNIQUE,

start\_location TEXT,

end\_location TEXT,

duration TEXT

)

''')

# Create schedules table if it doesn't exist

cur.execute('''

CREATE TABLE IF NOT EXISTS schedules (

id INTEGER PRIMARY KEY AUTOINCREMENT,

bus\_id INTEGER,

route\_id INTEGER,

departure\_time TEXT,

arrival\_time TEXT,

FOREIGN KEY (bus\_id) REFERENCES buses (id),

FOREIGN KEY (route\_id) REFERENCES routes (id)

)

''')

# Create bookings table if it doesn't exist

cur.execute('''

CREATE TABLE IF NOT EXISTS bookings (

id INTEGER PRIMARY KEY AUTOINCREMENT,

user\_id INTEGER,

schedule\_id INTEGER,

seat\_number INTEGER,

booking\_date TEXT,

status TEXT,

FOREIGN KEY (user\_id) REFERENCES users (id),

FOREIGN KEY (schedule\_id) REFERENCES schedules (id)

)

''')

# Create payments table if it doesn't exist

cur.execute('''

CREATE TABLE IF NOT EXISTS payments (

id INTEGER PRIMARY KEY AUTOINCREMENT,

booking\_id INTEGER,

amount REAL,

status TEXT,

payment\_date TEXT,

FOREIGN KEY (booking\_id) REFERENCES bookings (id)

)

''')

conn.commit()

def sign\_up():

username = simpledialog.askstring("Sign Up", "Enter username:")

password = simpledialog.askstring("Sign Up", "Enter password:", show='\*')

if username and password:

try:

cur.execute("INSERT INTO users (username, password) VALUES (?, ?)", (username, password))

conn.commit()

messagebox.showinfo("Success", "Sign Up successful! You can now login.")

except sqlite3.IntegrityError:

messagebox.showerror("Error", "Username already exists. Try another one.")

def login():

username = simpledialog.askstring("Login", "Enter username:")

password = simpledialog.askstring("Login", "Enter password:", show='\*')

cur.execute("SELECT \* FROM users WHERE username = ? AND password = ?", (username, password))

result = cur.fetchone()

if result:

messagebox.showinfo("Login Successful", "Welcome to the Bus Ticket Booking System")

open\_main\_menu()

else:

messagebox.showerror("Login Failed", "Invalid Username or Password")

def open\_main\_menu():

main\_menu = tk.Toplevel(root)

main\_menu.title("Bus Ticket Booking System")

main\_menu.geometry("400x500")

main\_menu.configure(bg='white')

ttk.Label(main\_menu, text="Bus Ticket Booking System", font=('Arial', 20)).pack(pady=20)

buttons = [

("Bus Management", open\_bus\_menu),

("Route Management", open\_route\_menu),

("Schedule Management", open\_schedule\_menu),

("Booking Management", open\_booking\_menu),

("Payment Management", open\_payment\_menu)

]

for text, command in buttons:

button = ttk.Button(main\_menu, text=text, command=command, style='TButton')

button.pack(pady=5, fill='x')

def open\_bus\_menu():

bus\_menu = tk.Toplevel(root)

bus\_menu.title("Bus Management")

bus\_menu.geometry("400x300")

bus\_menu.configure(bg='white')

ttk.Label(bus\_menu, text="Bus Management", font=('Arial', 20)).pack(pady=20)

buttons = [

("Add Bus", add\_bus),

("Update Bus Details", update\_bus),

("Get Bus Details", get\_bus\_details),

("Display Buses", display\_buses)

]

for text, command in buttons:

button = ttk.Button(bus\_menu, text=text, command=command, style='TButton')

button.pack(pady=5, fill='x')

def display\_buses():

cur.execute("PRAGMA table\_info(buses)")

columns = cur.fetchall()

column\_names = [col[1] for col in columns]

cur.execute("SELECT \* FROM buses")

rows = cur.fetchall()

display\_table(rows, "Buses", column\_names)

def add\_bus():

bus\_number = simpledialog.askstring("Add Bus", "Enter bus number:")

seats = simpledialog.askinteger("Add Bus", "Enter number of seats:")

driver\_name = simpledialog.askstring("Add Bus", "Enter driver's name:")

if bus\_number and seats and driver\_name:

cur.execute("INSERT INTO buses (bus\_number, seats, driver\_name) VALUES (?, ?, ?)",

(bus\_number, seats, driver\_name))

conn.commit()

messagebox.showinfo("Success", "Bus record added successfully!")

def update\_bus():

bus\_id = simpledialog.askinteger("Update Bus", "Enter bus ID to update:")

bus\_number = simpledialog.askstring("Update Bus", "Enter new bus number:")

seats = simpledialog.askinteger("Update Bus", "Enter new number of seats:")

driver\_name = simpledialog.askstring("Update Bus", "Enter new driver's name:")

if bus\_id and bus\_number and seats and driver\_name:

cur.execute("UPDATE buses SET bus\_number = ?, seats = ?, driver\_name = ? WHERE id = ?",

(bus\_number, seats, driver\_name, bus\_id))

conn.commit()

messagebox.showinfo("Success", "Bus record updated successfully!")

def get\_bus\_details():

bus\_id = simpledialog.askinteger("Get Bus Details", "Enter bus ID:")

if bus\_id:

cur.execute("SELECT \* FROM buses WHERE id = ?", (bus\_id,))

row = cur.fetchone()

if row:

bus\_details = f"ID: {row[0]}\nBus Number: {row[1]}\nSeats: {row[2]}\nDriver Name: {row[3]}"

messagebox.showinfo("Bus Details", bus\_details)

else:

messagebox.showerror("Error", "Bus not found")

def open\_route\_menu():

route\_menu = tk.Toplevel(root)

route\_menu.title("Route Management")

route\_menu.geometry("400x300")

route\_menu.configure(bg='white')

ttk.Label(route\_menu, text="Route Management", font=('Arial', 20)).pack(pady=20)

buttons = [

("Add Route", add\_route),

("Update Route", update\_route),

("View Route", view\_route),

("Display Routes", display\_routes)

]

for text, command in buttons:

button = ttk.Button(route\_menu, text=text, command=command, style='TButton')

button.pack(pady=5, fill='x')

def display\_routes():

cur.execute("PRAGMA table\_info(routes)")

columns = cur.fetchall()

column\_names = [col[1] for col in columns]

cur.execute("SELECT \* FROM routes")

rows = cur.fetchall()

display\_table(rows, "Routes", column\_names)

def add\_route():

route\_name = simpledialog.askstring("Add Route", "Enter route name:")

start\_location = simpledialog.askstring("Add Route", "Enter start location:")

end\_location = simpledialog.askstring("Add Route", "Enter end location:")

duration = simpledialog.askstring("Add Route", "Enter duration (HH:MM):")

if route\_name and start\_location and end\_location and duration:

cur.execute("INSERT INTO routes (route\_name, start\_location, end\_location, duration) VALUES (?, ?, ?, ?)",

(route\_name, start\_location, end\_location, duration))

conn.commit()

messagebox.showinfo("Success", "Route record added successfully!")

def update\_route():

route\_id = simpledialog.askinteger("Update Route", "Enter route ID to update:")

route\_name = simpledialog.askstring("Update Route", "Enter new route name:")

start\_location = simpledialog.askstring("Update Route", "Enter new start location:")

end\_location = simpledialog.askstring("Update Route", "Enter new end location:")

duration = simpledialog.askstring("Update Route", "Enter new duration (HH:MM):")

if route\_id and route\_name and start\_location and end\_location and duration:

cur.execute("UPDATE routes SET route\_name = ?, start\_location = ?, end\_location = ?, duration = ? WHERE id = ?",

(route\_name, start\_location, end\_location, duration, route\_id))

conn.commit()

messagebox.showinfo("Success", "Route record updated successfully!")

def view\_route():

route\_id = simpledialog.askinteger("View Route", "Enter route ID:")

if route\_id:

cur.execute("SELECT \* FROM routes WHERE id = ?", (route\_id,))

row = cur.fetchone()

if row:

route\_details = f"ID: {row[0]}\nRoute Name: {row[1]}\nStart Location: {row[2]}\nEnd Location: {row[3]}\nDuration: {row[4]}"

messagebox.showinfo("Route Details", route\_details)

else:

messagebox.showerror("Error", "Route not found")

def open\_schedule\_menu():

schedule\_menu = tk.Toplevel(root)

schedule\_menu.title("Schedule Management")

schedule\_menu.geometry("400x300")

schedule\_menu.configure(bg='white')

ttk.Label(schedule\_menu, text="Schedule Management", font=('Arial', 20)).pack(pady=20)

buttons = [

("Add Schedule", add\_schedule),

("Update Schedule", update\_schedule),

("View Schedule", view\_schedule),

("Display Schedules", display\_schedules)

]

for text, command in buttons:

button = ttk.Button(schedule\_menu, text=text, command=command, style='TButton')

button.pack(pady=5, fill='x')

def display\_schedules():

cur.execute("PRAGMA table\_info(schedules)")

columns = cur.fetchall()

column\_names = [col[1] for col in columns]

cur.execute("SELECT \* FROM schedules")

rows = cur.fetchall()

display\_table(rows, "Schedules", column\_names)

def add\_schedule():

bus\_id = simpledialog.askinteger("Add Schedule", "Enter bus ID:")

route\_id = simpledialog.askinteger("Add Schedule", "Enter route ID:")

departure\_time = simpledialog.askstring("Add Schedule", "Enter departure time (HH:MM):")

arrival\_time = simpledialog.askstring("Add Schedule", "Enter arrival time (HH:MM):")

if bus\_id and route\_id and departure\_time and arrival\_time:

cur.execute("INSERT INTO schedules (bus\_id, route\_id, departure\_time, arrival\_time) VALUES (?, ?, ?, ?)",

(bus\_id, route\_id, departure\_time, arrival\_time))

conn.commit()

messagebox.showinfo("Success", "Schedule record added successfully!")

def update\_schedule():

schedule\_id = simpledialog.askinteger("Update Schedule", "Enter schedule ID to update:")

bus\_id = simpledialog.askinteger("Update Schedule", "Enter new bus ID:")

route\_id = simpledialog.askinteger("Update Schedule", "Enter new route ID:")

departure\_time = simpledialog.askstring("Update Schedule", "Enter new departure time (HH:MM):")

arrival\_time = simpledialog.askstring("Update Schedule", "Enter new arrival time (HH:MM):")

if schedule\_id and bus\_id and route\_id and departure\_time and arrival\_time:

cur.execute("UPDATE schedules SET bus\_id = ?, route\_id = ?, departure\_time = ?, arrival\_time = ? WHERE id = ?",

(bus\_id, route\_id, departure\_time, arrival\_time, schedule\_id))

conn.commit()

messagebox.showinfo("Success", "Schedule record updated successfully!")

def view\_schedule():

schedule\_id = simpledialog.askinteger("View Schedule", "Enter schedule ID:")

if schedule\_id:

cur.execute("SELECT \* FROM schedules WHERE id = ?", (schedule\_id,))

row = cur.fetchone()

if row:

schedule\_details = f"ID: {row[0]}\nBus ID: {row[1]}\nRoute ID: {row[2]}\nDeparture Time: {row[3]}\nArrival Time: {row[4]}"

messagebox.showinfo("Schedule Details", schedule\_details)

else:

messagebox.showerror("Error", "Schedule not found")

def open\_booking\_menu():

booking\_menu = tk.Toplevel(root)

booking\_menu.title("Booking Management")

booking\_menu.geometry("400x300")

booking\_menu.configure(bg='white')

ttk.Label(booking\_menu, text="Booking Management", font=('Arial', 20)).pack(pady=20)

buttons = [

("Book Ticket", book\_ticket),

("Cancel Booking", cancel\_booking),

("View Booking", view\_booking),

("Display Bookings", display\_bookings)

]

for text, command in buttons:

button = ttk.Button(booking\_menu, text=text, command=command, style='TButton')

button.pack(pady=5, fill='x')

def display\_bookings():

cur.execute("PRAGMA table\_info(bookings)")

columns = cur.fetchall()

column\_names = [col[1] for col in columns]

cur.execute("SELECT \* FROM bookings")

rows = cur.fetchall()

display\_table(rows, "Bookings", column\_names)

def book\_ticket():

user\_id = simpledialog.askinteger("Book Ticket", "Enter user ID:")

schedule\_id = simpledialog.askinteger("Book Ticket", "Enter schedule ID:")

seat\_number = simpledialog.askinteger("Book Ticket", "Enter seat number:")

booking\_date = simpledialog.askstring("Book Ticket", "Enter booking date (YYYY-MM-DD):")

status = simpledialog.askstring("Book Ticket", "Enter status (confirmed/pending):")

if user\_id and schedule\_id and seat\_number and booking\_date and status:

cur.execute("INSERT INTO bookings (user\_id, schedule\_id, seat\_number, booking\_date, status) VALUES (?, ?, ?, ?, ?)",

(user\_id, schedule\_id, seat\_number, booking\_date, status))

conn.commit()

messagebox.showinfo("Success", "Ticket booked successfully!")

def cancel\_booking():

booking\_id = simpledialog.askinteger("Cancel Booking", "Enter booking ID to cancel:")

if booking\_id:

cur.execute("DELETE FROM bookings WHERE id = ?", (booking\_id,))

conn.commit()

messagebox.showinfo("Success", "Booking cancelled successfully!")

def view\_booking():

booking\_id = simpledialog.askinteger("View Booking", "Enter booking ID:")

if booking\_id:

cur.execute("SELECT \* FROM bookings WHERE id = ?", (booking\_id,))

row = cur.fetchone()

if row:

booking\_details = f"ID: {row[0]}\nUser ID: {row[1]}\nSchedule ID: {row[2]}\nSeat Number: {row[3]}\nBooking Date: {row[4]}\nStatus: {row[5]}"

messagebox.showinfo("Booking Details", booking\_details)

else:

messagebox.showerror("Error", "Booking not found")

def open\_payment\_menu():

payment\_menu = tk.Toplevel(root)

payment\_menu.title("Payment Management")

payment\_menu.geometry("400x300")

payment\_menu.configure(bg='white')

ttk.Label(payment\_menu, text="Payment Management", font=('Arial', 20)).pack(pady=20)

buttons = [

("Make Payment", make\_payment),

("View Payment", view\_payment),

("Display Payments", display\_payments)

]

for text, command in buttons:

button = ttk.Button(payment\_menu, text=text, command=command, style='TButton')

button.pack(pady=5, fill='x')

def display\_payments():

cur.execute("PRAGMA table\_info(payments)")

columns = cur.fetchall()

column\_names = [col[1] for col in columns]

cur.execute("SELECT \* FROM payments")

rows = cur.fetchall()

display\_table(rows, "Payments", column\_names)

def make\_payment():

booking\_id = simpledialog.askinteger("Make Payment", "Enter booking ID:")

amount = simpledialog.askfloat("Make Payment", "Enter amount:")

status = simpledialog.askstring("Make Payment", "Enter payment status (completed/pending):")

payment\_date = simpledialog.askstring("Make Payment", "Enter payment date (YYYY-MM-DD):")

if booking\_id and amount and status and payment\_date:

cur.execute("INSERT INTO payments (booking\_id, amount, status, payment\_date) VALUES (?, ?, ?, ?)",

(booking\_id, amount, status, payment\_date))

conn.commit()

messagebox.showinfo("Success", "Payment made successfully!")

def view\_payment():

payment\_id = simpledialog.askinteger("View Payment", "Enter payment ID:")

if payment\_id:

cur.execute("SELECT \* FROM payments WHERE id = ?", (payment\_id,))

row = cur.fetchone()

if row:

payment\_details = f"ID: {row[0]}\nBooking ID: {row[1]}\nAmount: {row[2]}\nStatus: {row[3]}\nPayment Date: {row[4]}"

messagebox.showinfo("Payment Details", payment\_details)

else:

messagebox.showerror("Error", "Payment not found")

def display\_table(rows, title, column\_names):

table\_window = tk.Toplevel(root)

table\_window.title(title)

table\_window.geometry("600x400")

table\_window.configure(bg='white')

table = ttk.Treeview(table\_window, columns=column\_names, show='headings')

for col in column\_names:

table.heading(col, text=col)

table.column(col, anchor="center")

for row in rows:

table.insert("", "end", values=row)

table.pack(expand=True, fill='both')

# Main window

root = tk.Tk()

root.title("Bus Ticket Booking System")

root.geometry("400x300")

root.configure(bg='white')

# Adding a stylish theme

style = ttk.Style()

style.configure('TButton', font=('Arial', 14), padding=10)

style.configure('TLabel', font=('Arial', 14))

ttk.Label(root, text="Bus Ticket Booking System", font=('Arial', 20)).pack(pady=20)

ttk.Button(root, text="Sign Up", command=sign\_up, style='TButton').pack(pady=5)

ttk.Button(root, text="Login", command=login, style='TButton').pack(pady=5)

root.mainloop()

**5.2. BACKEND – MYSQL**

CREATE TABLE users (

id INT AUTO\_INCREMENT PRIMARY KEY,

name VARCHAR(100),

email VARCHAR(100) UNIQUE,

password VARCHAR(100)

);

CREATE TABLE buses (

id INT AUTO\_INCREMENT PRIMARY KEY,

bus\_number VARCHAR(50),

capacity INT,

type VARCHAR(50)

);

CREATE TABLE routes (

id INT AUTO\_INCREMENT PRIMARY KEY,

origin VARCHAR(100),

destination VARCHAR(100),

distance DECIMAL(10, 2)

);

CREATE TABLE schedules (

id INT AUTO\_INCREMENT PRIMARY KEY,

bus\_id INT,

route\_id INT,

departure\_time TIME,

arrival\_time TIME,

FOREIGN KEY (bus\_id) REFERENCES buses(id),

FOREIGN KEY (route\_id) REFERENCES routes(id)

);

CREATE TABLE bookings (

id INT AUTO\_INCREMENT PRIMARY KEY,

user\_id INT,

schedule\_id INT,

seat\_number INT,

booking\_time TIMESTAMP DEFAULT CURRENT\_TIMESTAMP,

FOREIGN KEY (user\_id) REFERENCES users(id),

FOREIGN KEY (schedule\_id) REFERENCES schedules(id)

);

CREATE TABLE payments (

id INT AUTO\_INCREMENT PRIMARY KEY,

booking\_id INT,

amount DECIMAL(10, 2),

status VARCHAR(50),

payment\_date TIMESTAMP DEFAULT CURRENT\_TIMESTAMP,

FOREIGN KEY (booking\_id) REFERENCES bookings(id)

);

SELECT \* FROM users;

SELECT \* FROM buses;

SELECT \* FROM routes;

SELECT \* FROM schedules;

SELECT \* FROM bookings;

SELECT \* FROM payments;

SELECT

bookings.id,

users.name AS user\_name,

schedules.departure\_time,

schedules.arrival\_time,

bookings.seat\_number

FROM bookings

JOIN users ON bookings.user\_id = users.id

JOIN schedules ON bookings.schedule\_id = schedules.id;

SELECT

schedules.id,

buses.bus\_number,

routes.origin,

routes.destination,

schedules.departure\_time,

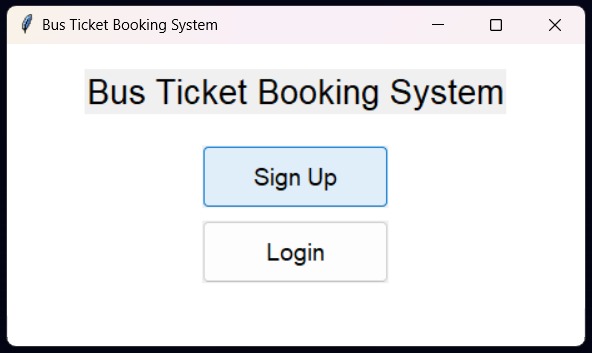
schedules.arrival\_time

FROM schedules

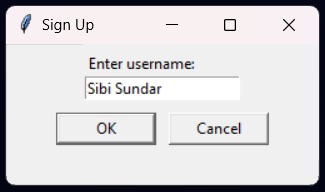
JOIN buses ON schedules.bus\_id = buses.id

JOIN routes ON schedules.route\_id = routes.id;

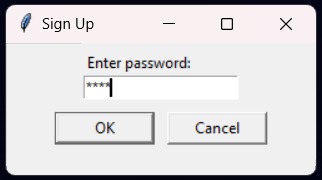
**5. RESULTS AND DISCUSSION**

****

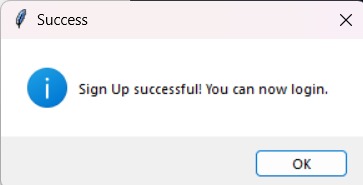
Login Window

****

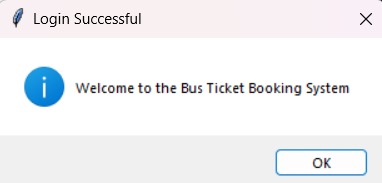
User name

****

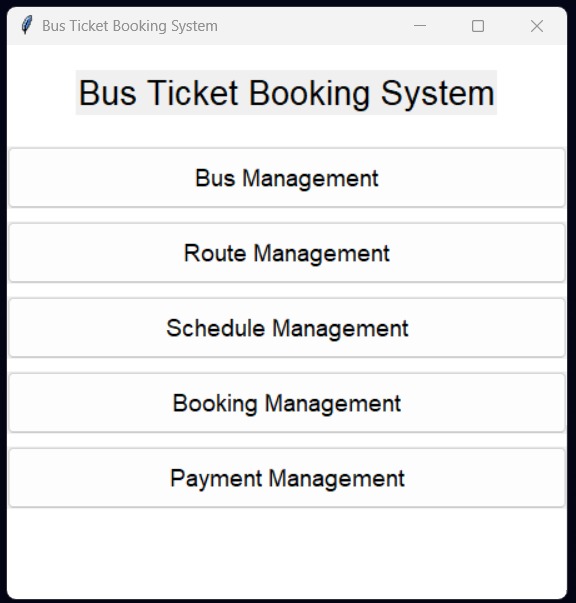
Enter posword

****

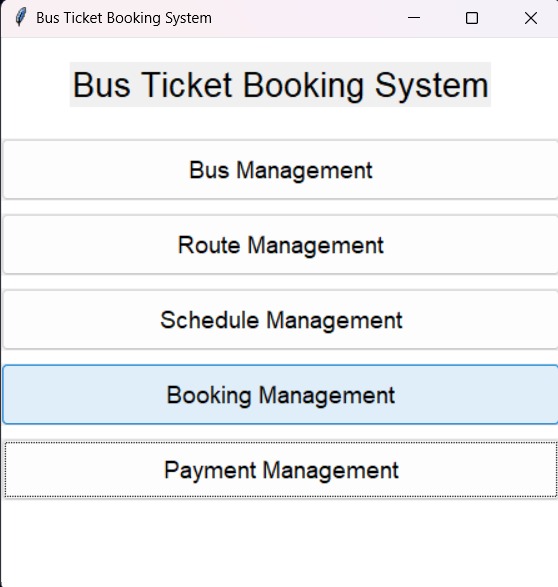
Login Successful Window

****

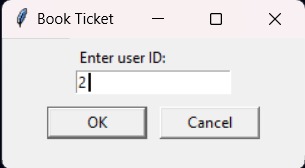
Login successful to booking system

****

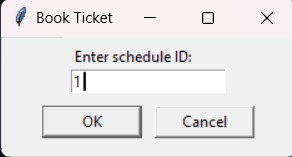
Bus Ticket Booking System

****

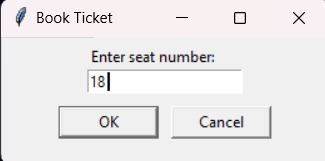
Booking Management

****

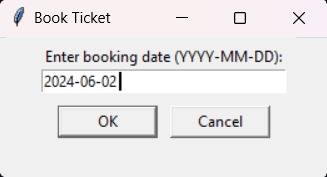
Book Ticket User ID

****

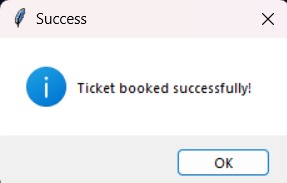
Book Ticket Schedule ID

****

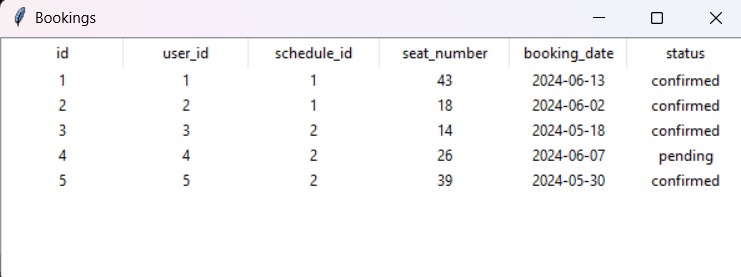
Seat Number

****

Booking date

****

Ticket booked succesfully

****

Booking Tavble

**6.CONCLUSION**

The Bus Booking System (BBS) leverages the power of Python and SQL to provide a robust, efficient, and user-friendly solution for managing bus reservations. Python's simplicity and versatility ensure smooth integration of various functionalities, from user interface design to business logic implementation. SQL's standardized syntax and advanced capabilities in data manipulation and management guarantee the reliability and integrity of the system's database infrastructure. Together, these technologies facilitate the creation of a scalable and effective bus booking system, enhancing the overall user experience and operational efficiency. Through this project, we have demonstrated the potential of combining these powerful tools to address real-world challenges in the transportation sector.

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