Mini project report on

Voice Based Transport Enquiry System

Submitted in partial fulfilment of the requirements for the award of degree of

Bachelor of Technology

in

Computer Science & Engineering

UE22CS351A – DBMS Project

Submitted by :

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Under the guidance of
Dr. Geetha Dayalan
PES University
AUG - DEC 2024

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

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Electronic City, Hosur Road, Bengaluru – 560 100, Karnataka, India

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CERTIFICATE

This is to certify that the mini project entitled

Voice Based Transport Enquiry System

Is a bonafide work carried out by

Velkur Geethika Reddy	PES2UG22CS656
Venkateswara Hema Sruthi	PES2UG22CS659

In partial fulfilment for the completion of fifth semester DBMS Project (UE22CS351A) in the Program of Study - Bachelor of Technology in Computer Science and Engineering under rules and regulations of PES University, Bengaluru during the period AUG. 2024 – DEC. 2024. It is certified that all corrections / suggestions indicated for internal assessment have been incorporated in the report. The project has been approved as it satisfies the 5th semester academic requirements in respect of project work.

Signature
Dr. Geetha Dayalan
Associate Professor, PES University

DECLARATION

We hereby declare that the DBMS Project entitled University Fest Management System has been carried out by us under the guidance of Dr. Geetha Dayalan and submitted in partial fulfillment of the course requirements for the award of degree of Bachelor of Technology in Computer Science and Engineering of PES University, Bengaluru during the academic semester AUG – DEC 2024.

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ABSTRACT

Our project, "Voice-Based Enquiry System for Bus Reservations," is an intelligent, voice-driven platform designed to streamline the bus booking experience. Targeted primarily at users who seek a convenient and interactive way to plan travel, this system allows users to log in, search for buses, book tickets, make payments, and download tickets using voice commands. The voice interaction is seamlessly integrated, guiding users through each step with spoken prompts, making it especially accessible for those who prefer hands-free operation. The system combines a robust database backend to handle real-time queries with a user-friendly voice interface, ensuring a smooth, efficient, and engaging booking experience.

TABLE OF CONTENTS

DESCRIPTION

The "Voice-Based Enquiry System for Bus Reservations" is an innovative platform that enables users to search, book, and manage bus travel through voice commands, making the process highly intuitive and accessible. By combining a robust database with a user-friendly voice interface, the system allows users to log in, search for available buses by specifying origin, destination, date, or time, book tickets, make payments, and download their tickets, all through simple voice interactions. Designed to enhance accessibility, this platform enables users to navigate the entire booking process hands-free, guided by responsive voice prompts that inform them at each step. The backend database securely manages user data, bus schedules, routes, and transactions, ensuring real-time access to updated information and optimized query performance. For ticket booking, the system calculates fares, verifies seat availability, and processes secure payments, allowing users to complete their reservations seamlessly. By automating every stage of the journey with voice commands such as "Login," "Search for a bus," "Book a ticket," and "Pay now," the platform creates a modern, interactive booking experience. This voice-driven approach not only simplifies bus reservations but also caters to a wider audience, making travel planning more convenient, engaging, and accessible.

User Authentication: The platform features a secure login system, allowing users to sign in with their credentials. It also supports user role differentiation (Admin and NonAdmin) for specialized access and actions. Once authenticated, the system provides tailored features based on the user's profile.

Voice-Driven Bus Search: Users can verbally request specific bus routes by specifying origin, destination, date, or time preferences. The voice assistant processes the request, checks the database, and retrieves available buses that match the search criteria. The system is designed to handle natural language queries for an intuitive search experience.

Ticket Booking and Payment: Once a suitable bus is found, users can proceed to book tickets via voice commands, selecting options for seat type (e.g., sleeper or regular) and inputting details. The system then calculates the fare and initiates the payment process. Payment can be completed within the app, with voice guidance at each stage, enhancing the simplicity of the booking flow.

Ticket Download and Notifications: After booking, users can download the ticket directly through the platform. Additionally, voice prompts inform the user of the successful booking and ticket availability. The ticket includes essential travel details, such as bus registration, departure time, and seat information.

Database and Query Management: The backend database stores all relevant data on users, buses, routes, schedules, and transactions. The system supports complex queries for route management, seat availability, and fare calculation. By leveraging optimized SQL queries and stored procedures, the platform delivers quick and accurate results for user queries.

Voice Commands and Automation: A key innovation is the use of voice commands to manage every stage of the user journey. Users can issue commands like "Login," "Search for a bus," "Book a ticket," and "Pay now." This not only enhances accessibility but also allows users to interact in a more natural and engaging way.

USER REQUIREMENT SPECIFICATION

Purpose of the Project

The primary purpose of the "Voice-Based Enquiry System for Bus Reservations" is to streamline the bus booking process by providing an intuitive, hands-free interface. By enabling users to search for buses, book tickets, make payments, and receive booking confirmations through voice commands, this system enhances the accessibility and convenience of bus travel planning. The project is designed to simplify the user journey, particularly for individuals who may face difficulties with traditional booking interfaces, such as the elderly, visually impaired users, or those who prefer a hands-free experience.

Scope of the Project

This project encompasses the development of a comprehensive bus reservation platform that leverages both voice-command functionality and a robust backend database. Key features within the scope include user authentication, secure login, voice-based search for buses by specific routes and times, real-time seat availability checks, ticket booking and fare calculation, secure payment integration, and automated ticket generation and download. The project will also include voice prompts to guide users through each stage of the booking process. The platform is designed to handle high volumes of users, supporting both end-users (NonAdmin) for ticket bookings and administrators (Admin) who manage bus schedules and agency information. Future expansions of the system could include additional routes, multi-language support, and advanced machine learning

capabilities to improve voice recognition accuracy and enhance user experience.

Detailed Description

The "Voice-Based Enquiry System for Bus Reservations" is a user-centric platform that transforms the traditional bus booking process into an interactive and hands-free experience, utilizing advanced voice-command technology. At its core, the system allows users to manage the entire journey of booking bus tickets by simply issuing voice commands, enhancing the accessibility and usability of the service. The platform supports secure user authentication, enabling users to sign in with their credentials, and offers differentiated access for Admin and NonAdmin roles. Once logged in, the user can initiate a voice-based search for available buses by specifying details such as the origin, destination, travel date, and preferred time. The voice interface communicates with the backend database, which stores extensive data on buses, routes, schedules, and tickets, enabling real-time updates and accurate responses to user queries. For ticket bookings, the system verifies seat availability, calculates the fare, and facilitates secure payment processing. Once a ticket is booked, the user can download it from the platform, and the system provides a voice confirmation, detailing essential travel information such as bus registration, departure time, and seat assignment. Through optimized SQL queries, stored procedures, and efficient database management, the platform ensures seamless data retrieval and processing, supporting a quick and reliable booking experience. This voice-driven platform not only enhances user convenience but also fosters inclusivity, making bus travel planning accessible to a wider audience, including those with physical limitations or those who prefer an interactive, hands-free approach to travel reservations.

LIST OF SOFTWARE/TOOLS/PROGRAMMING LANGUAGES USED

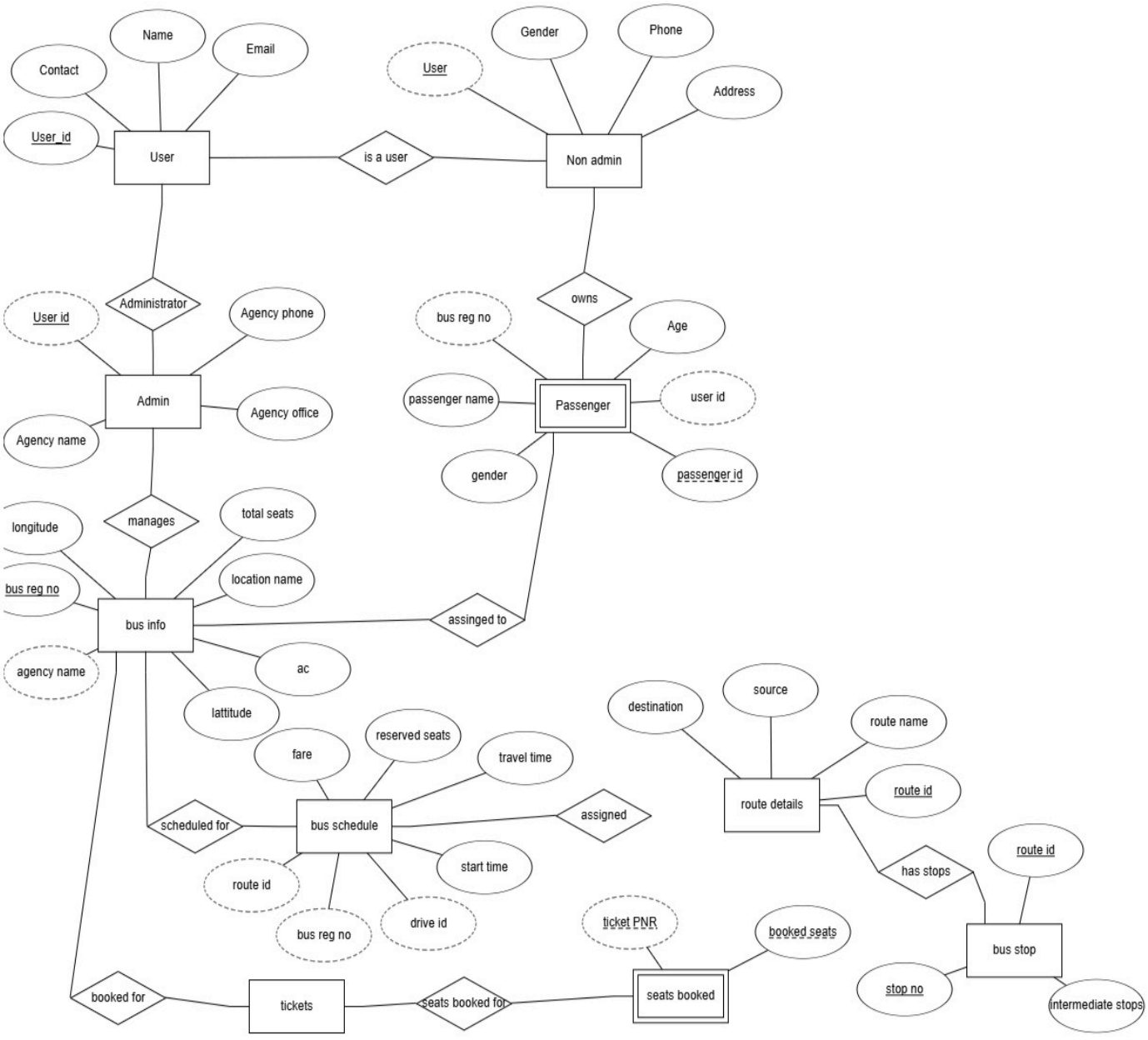
This project incorporates the use of :

MySQL Workbench is used for the back-end of this project and is used primarily as a backbone, creating and keeping the tables required

JavaScript, specifically for a Node.js environment, using Express.js to create a backend server that interacts with a MySQL database.

We utilized CSS (Cascading Style Sheets) extensively to create a visually appealing and responsive graphical user interface (GUI) for our application. CSS allowed us to separate content from presentation, enabling us to control the look and feel of the application effectively.

ER MODEL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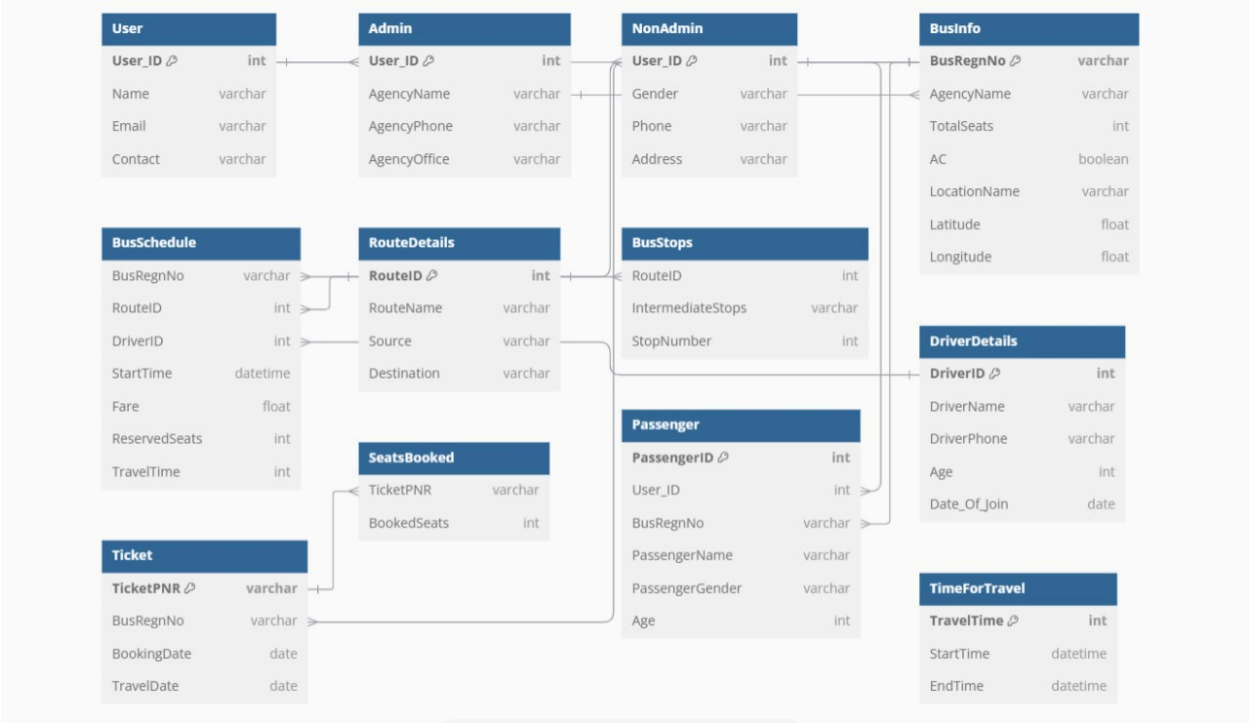
RELATIONAL SCHEMA



DDL STATEMENTS

```
CREATE TABLE UserTable(
    ID serial,
    Email varchar(40) NOT NULL UNIQUE,
    Name varchar(30),
    Password varchar(15) NOT NULL,
    Usertype varchar(10) NOT NULL,
    PRIMARY KEY (ID)
);

-- Create NonAdmin table
CREATE TABLE NonAdmin(
    ID serial,
    Gender varchar(7),
    Phone numeric(10,0) NOT NULL UNIQUE CONSTRAINT Phone1_chk CHECK(Phone > 999999999),
    Address varchar(100),
    PRIMARY KEY(ID),
    FOREIGN KEY(ID) REFERENCES UserTable(ID) ON DELETE CASCADE
);

-- Create Admin table
CREATE TABLE Admin(


CREATE TABLE BusInfo(
    BusRegnNo varchar(15) NOT NULL,
    AgencyName varchar(35) NOT NULL,
    TotalSeats integer DEFAULT 40,
    AC numeric(1) DEFAULT 0,
    LocationName varchar(20),
    Latitude numeric(17,10),
    Longitude numeric(17,10),
    PRIMARY KEY(BusRegnNo),
    FOREIGN KEY(AgencyName) REFERENCES Admin(AgencyName) ON DELETE CASCADE
);

-- Create AgencyDetails table
CREATE TABLE AgencyDetails(
    AgencyName varchar(35) NOT NULL,
    AgencyAddress varchar(50) NOT NULL
);

-- Create BusSchedule table
CREATE TABLE BusSchedule(
```

```sql
CREATE TABLE TimeForTravel(
    TravelTime numeric(10) CONSTRAINT EstTim2_chk CHECK(Traveltime > 0),
    StartTime numeric(4,2) CONSTRAINT Start1_check CHECK(StartTime >= 0 AND StartTime < 24),
    EndTime numeric(4,2) CONSTRAINT End1_chk CHECK(EndTime >= 0 AND EndTime < 24),
    PRIMARY KEY(TravelTime, StartTime)
);

-- Create RouteDetails table
CREATE TABLE RouteDetails(
    RouteID integer CONSTRAINT Routeid4_chk CHECK(RouteID > 0),
    RouteName varchar(30) NOT NULL,
    Source varchar(30) NOT NULL,
    Destination varchar(30) NOT NULL
);

-- Create BusStops table
CREATE TABLE BusStops(
    RouteID integer NOT NULL CONSTRAINT Routeid_chk CHECK(RouteID > 0),
    IntermediateStops varchar(20) NOT NULL,
    StopNumber integer NOT NULL CONSTRAINT Stop_num CHECK(StopNumber > 0)
);

CREATE TABLE DriverDetails(
    DriverID serial,
    DriverName varchar(20) NOT NULL,
    DriverPhone numeric(10) CONSTRAINT Phone3_chk CHECK(DriverPhone > 999999999),
    Age numeric(3) CONSTRAINT CHECK(Age > 0),
    Date_Of_Join date,
    PRIMARY KEY(DriverID)
);

-- Create Ticket table
CREATE TABLE Ticket(
    BusRegnNo varchar(15) NOT NULL,
    TicketPNR serial,
    BookingDate date,
    TravelDate date,
    PRIMARY KEY(TicketPNR),
    CONSTRAINT dat_chk CHECK(TravelDate > BookingDate + 2),
    FOREIGN KEY(BusRegnNo) REFERENCES BusInfo(BusRegnNo)
);

-- Create SeatsBooked table
CREATE TABLE SeatsBooked(
```

```sql
CREATE TABLE SeatInfo(
    BusRegnNo varchar(15) NOT NULL UNIQUE,
    SeatNo integer CONSTRAINT SeatNo_chk CHECK(SeatNo > 40),
    Sleeper numeric(1) DEFAULT 0,
    FOREIGN KEY(BusRegnNo) REFERENCES BusInfo(BusRegnNo) ON DELETE CASCADE
);

-- Create Passenger table
CREATE TABLE Passenger(
    ID serial,
    BusRegnNo varchar(15) NOT NULL,
    PassengerID integer CONSTRAINT passid_chk CHECK(PassengerID > 0),
    PassengerName varchar(20),
    PassengeGender varchar(7),
    Age integer CONSTRAINT age2_chk CHECK(Age > 5),
    PRIMARY KEY(PassengerID),
    FOREIGN KEY(ID) REFERENCES NonAdmin(ID) ON DELETE CASCADE,
    FOREIGN KEY(BusRegnNo) REFERENCES BusInfo(BusRegnNo)
);
```

DML STATEMENTS(CRUD Operations)

```
INSERT INTO DriverDetails VALUES('126', 'Prithvi', '9834534565', '29', '2017-09-22');

-- Insert into BusStops
-- Insert stops for Route 4 (Bangalore to Chennai)
INSERT INTO BusStops (RouteId, IntermediateStops, StopNumber)
VALUES
('4', 'Chennai', '7'),
('4', 'Bangalore', '6');

-- Insert stops for Route 3 (Chennai to Bangalore)
INSERT INTO BusStops (RouteId, IntermediateStops, stopNumber)
VALUES
('3', 'Chennai', '1'),
('3', 'Bangalore', '2');

-- Insert stops for Route 2 (Bangalore to Tirupur)
INSERT INTO BusStops (RouteId, IntermediateStops, stopNumber)
VALUES
('2', 'Bangalore', '1'),
('2', 'Tirupur', '2');
```

```
INSERT INTO RouteDetails VALUES('4', 'BGL-CNI', 'Bangalore', 'Chennai');
INSERT INTO RouteDetails VALUES('3', 'CNI-BGL', 'Chennai', 'Bangalore');
INSERT INTO RouteDetails VALUES('2', 'BGL-TRR', 'Bangalore', 'Tirupur');

-- Insert into TimeForTravel
INSERT INTO TimeForTravel VALUES('12', '17.30', '05.30');
INSERT INTO TimeForTravel VALUES('15', '19.00', '10.00');
INSERT INTO TimeForTravel VALUES('14', '19.45', '09.45');
INSERT INTO TimeForTravel VALUES('15', '19.15', '10.15');
INSERT INTO TimeForTravel VALUES('17', '19.00', '12.00');

-- Insert into Through
INSERT INTO Through VALUES('1', '121', '17.30', '0', '1003');
INSERT INTO Through VALUES('1', '122', '19.00', '0', '1004');
INSERT INTO Through VALUES('2', '123', '19.45', '0', '1001');
INSERT INTO Through VALUES('3', '124', '19.15', '0', '1005');
```

```sql
SELECT DISTINCT RouteId
FROM BusStops
WHERE IntermediateStops = 'Bangalore'
AND RouteId IN (
  SELECT RouteId
  FROM BusStops
  WHERE IntermediateStops = 'Chennai'
);
SELECT * FROM BusSchedule WHERE RouteID IN (3, 4);
-- Inserting into Admin table first
-- Inserting into UserTable


select * from seatsbooked;

SELECT DISTINCT RouteId
FROM BusStops
WHERE IntermediateStops = 'Bangalore'
AND RouteId IN (
  SELECT RouteId
  FROM BusStops
  WHERE IntermediateStops = 'Chennai'
);
SELECT * FROM BusSchedule WHERE RouteID IN (3, 4);
```

```
INSERT INTO RouteDetails (RouteID, RouteName, Source, Destination) VALUES
(5, 'BGL-COI', 'Bangalore', 'Coimbatore'),
(6, 'CNI-COI', 'Chennai', 'Coimbatore');
-- Adding stops for Route 5 (Bangalore to Coimbatore)
INSERT INTO BusStops (RouteId, IntermediateStops, StopNumber)
VALUES
(5, 'Bangalore', 1),
(5, 'Coimbatore', 2);

-- Adding stops for Route 6 (Chennai to Coimbatore)
INSERT INTO BusStops (RouteId, IntermediateStops, StopNumber)
VALUES
(6, 'Chennai', 1),
(6, 'Coimbatore', 2);
INSERT INTO BusInfo (BusRegnNo, AgencyName, TotalSeats, AC, LocationName, Latitude, Longitude)
VALUES
('9012', 'ABC Travels', 50, 1, 'Bangalore', 12.9716, 77.5946),
('3456', 'CDE Travels', 45, 0, 'Chennai', 13.0827, 80.2707);
INSERT INTO BusSchedule (BusRegnNo, RouteID, DriverID, StartTime, Fare, ReservedSeats, TravelTime)
VALUES
    ('9012', 5, 105, 16.00, 750, 0, 6),   -- Bangalore to Coimbatore (EndTime = 24.00)
```

AGGREGATE JOIN QUERY, PROCEDURE AND TRIGGER

Aggregate Join query :

```
CREATE PROCEDURE totalrevenue()
BEGIN
    SELECT AgencyName, SUM(Fare) FROM BusInfo NATURAL JOIN BusSchedule GROUP BY AgencyName;
END$$
DELIMITER ;
```

Procedure :

Aggregates fare data to provide agency-level revenue reporting, supporting business intelligence by calculating and grouping revenue information for easy access.

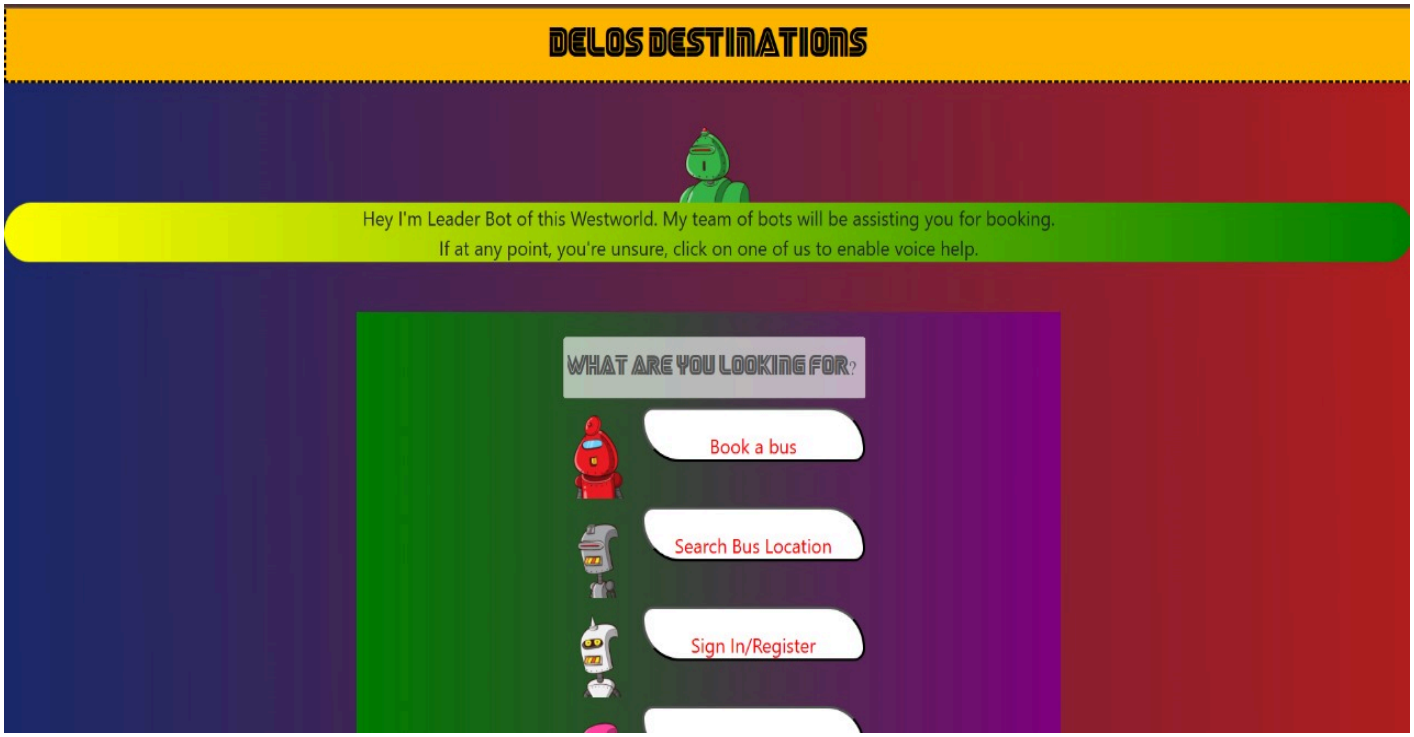
```
DELIMITER $$
CREATE PROCEDURE totalrevenue()
BEGIN
    SELECT AgencyName, SUM(Fare) FROM BusInfo NATURAL JOIN BusSchedule GROUP BY AgencyName;
END$$
DELIMITER ;

-- Call procedure
CALL totalrevenue();
SELECT distinct RouteId
FROM BusStops
WHERE RouteId IN (
  SELECT RouteId FROM BusStops WHERE IntermediateStops = 'Bangalore'
)
AND RouteId IN (
  SELECT RouteId FROM BusStops WHERE IntermediateStops = 'Chennai'
);
```

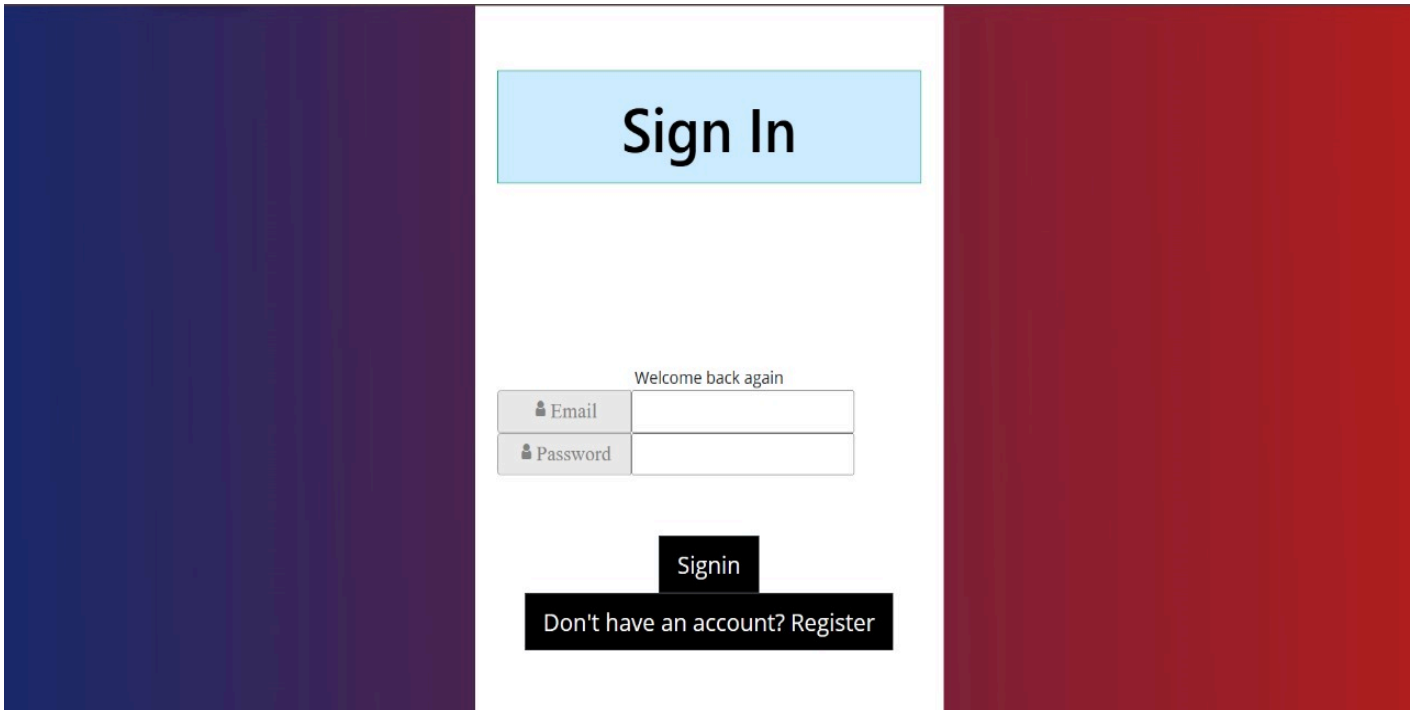
Trigger :

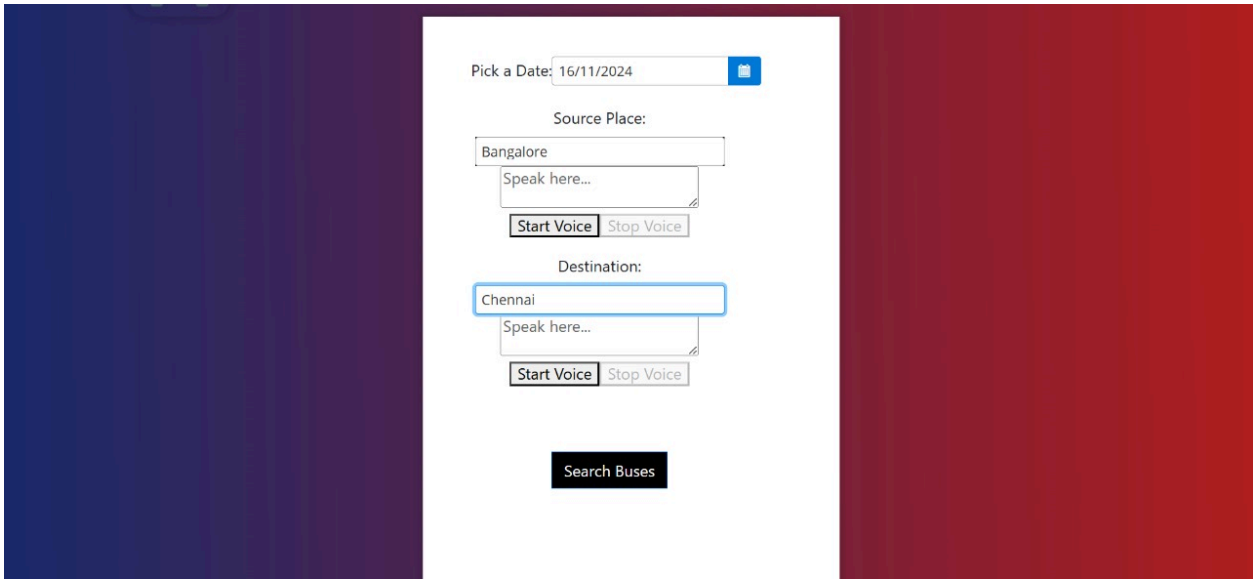
Automates time calculation for travel schedules, ensuring **`TimeForTravel`** data aligns with each bus schedule entry, reflecting real-world timings.

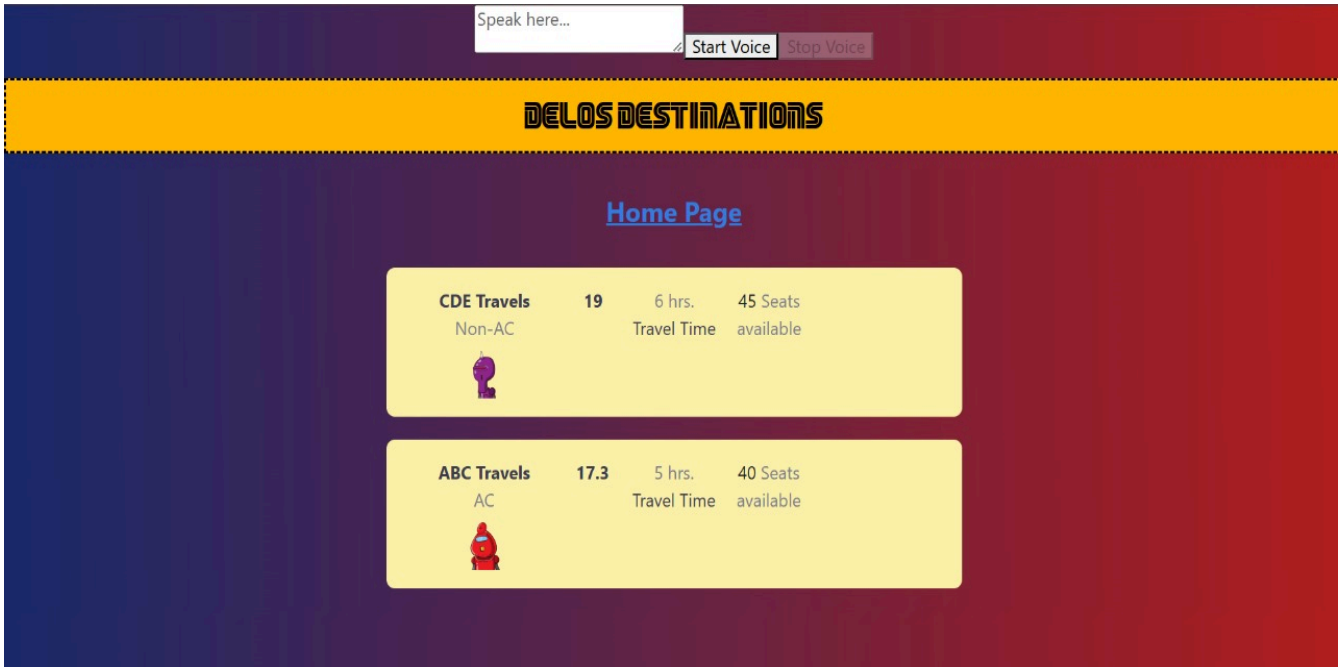
```
DELIMITER $$
CREATE TRIGGER TimeTravel AFTER INSERT ON BusSchedule
FOR EACH ROW
BEGIN
    IF(NEW.TravelTime + NEW.StartTime > 24.00) THEN
        INSERT INTO TimeForTravel(TravelTime, StartTime, EndTime)
        VALUES(NEW.TravelTime, NEW.StartTime, NEW.TravelTime + NEW.StartTime - 24);
    ELSE
        INSERT INTO TimeForTravel(TravelTime, StartTime, EndTime)
        VALUES(NEW.TravelTime, NEW.StartTime, NEW.TravelTime + NEW.StartTime);
    END IF;
END$$
DELIMITER ;
```

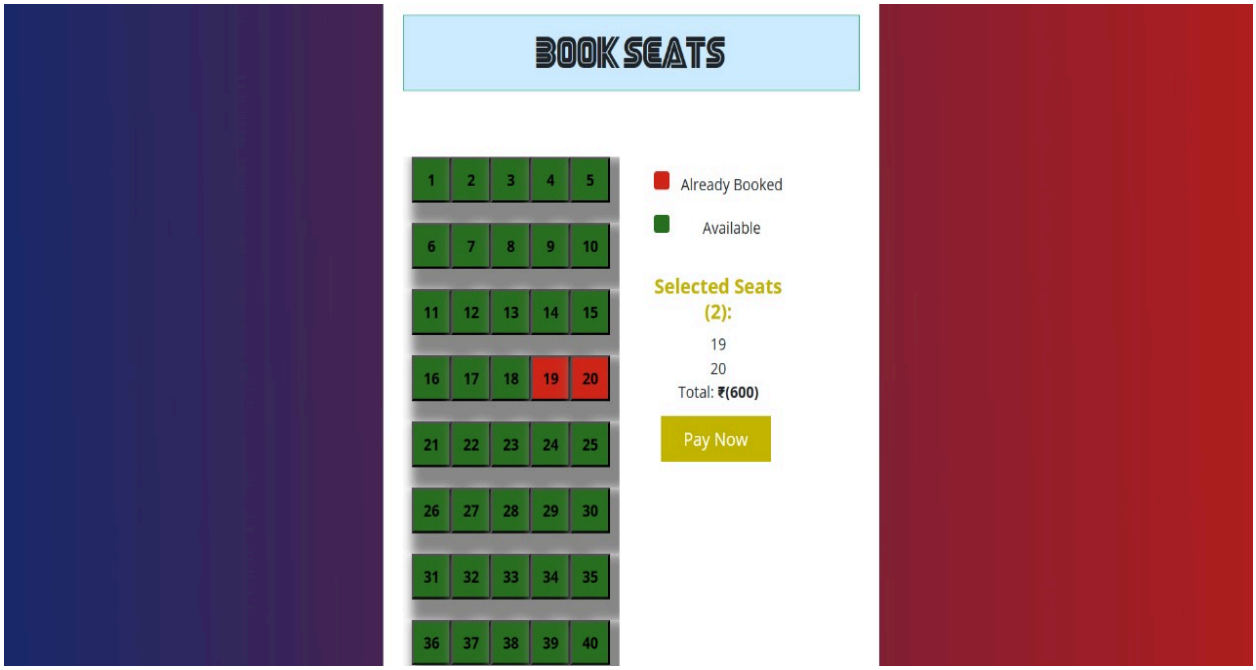
FRONT END DEVELOPMENT (FUNCTIONALITY/FEATURES)

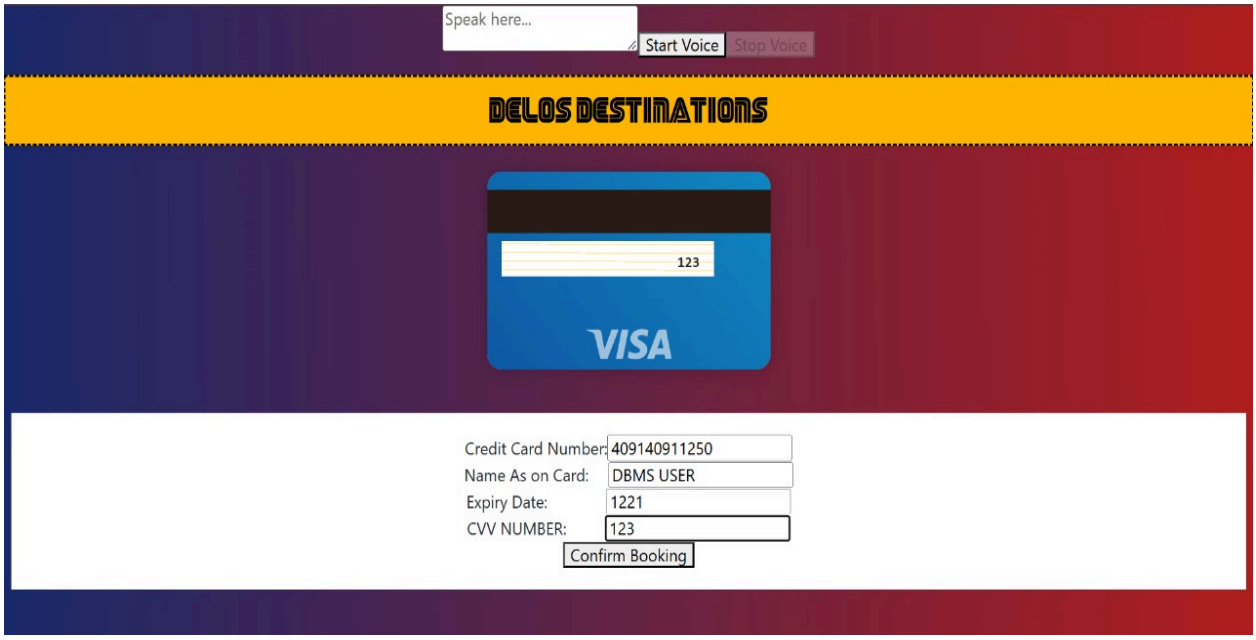



Sign In
Welcome back again
Email
Password
Signin
Don't have an account? Register


Pick a Date: 16/11/2024
Source Place:
Bangalore
Speak here...
Start Voice
Stop Voice
Destination:
Chennai
Speak here...
Start Voice
Stop Voice
Search Buses


Speak here...
Start Voice
Stop Voice
DELOS DESTINATIONS
Home Page
CDE Travels
Non-AC
19
6 hrs.
Travel Time
45 Seats
available
ABC Travels
AC
17.3
5 hrs.
Travel Time
40 Seats
available


BOOK SEATS
1 2 3 4 5
6 7 8 9 10
11 12 13 14 15
16 17 18 19 20
21 22 23 24 25
26 27 28 29 30
31 32 33 34 35
36 37 38 39 40
Already Booked
Available
Selected Seats (2):
19
20
Total: ₹(600)
Pay Now


Speak here...
Start Voice
Stop Voice
DELOS DESTINATIONS
123
VISA
Credit Card Number: 409140911250
Name As on Card: DBMS USER
Expiry Date: 1221
CVV NUMBER: 123
Confirm Booking

YOUR TICKET DETAILS

DATE OF TRAVEL: Invalid Date
BOOKED ON: Fri Nov 15 2024
SERVICE START POINT: Bangalore
SERVICE END POINT: Chennai
Booked Seats: 1920

Print this out!

GITHUB LINK :

https://github.com/hemasruthi018/VOICE_BASED_TRANSPORT_ENQUIRY_SYSTEM.git

Conclusion :

The "Voice-Based Enquiry System for Bus Reservations" is a modern solution that revolutionizes the way users book their bus tickets by integrating voice recognition technology with a seamless user interface. By offering a hands-free, interactive experience, the system not only simplifies the process of searching, booking, and managing bus travel but also enhances accessibility for users with diverse needs, including the elderly and visually impaired. The platform's efficient use of voice commands, combined with a robust backend database, ensures that users can effortlessly navigate through the entire booking process—from login to ticket download. As the system continues to evolve, future enhancements could include multi-language support, more personalized user interactions, and AI-driven improvements to voice recognition, further expanding its capabilities and reach. Overall, this project sets the foundation for a more convenient, accessible, and innovative way to plan bus travel, contributing to the advancement of smart, voice-enabled systems in everyday services.