MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
(A constituent unit of MAHE, Manipal)

DATABASE SYSTEMS LAB (CSE -2241)

MINI PROJECT REPORT ON

Local Bus Management System

SUBMITTED TO

Department of Computer Science & Engineering

by

Pranamya G Kulal 220905018 (Roll no. 8)
Ayush Prabhu 220905010 (Roll no. 6)

Name & Signature of Evaluator 1

Name & Signature of Evaluator 2

i)ABSTRACT

In the present world, there is a rapid growth in the transportation sector including the mass transportation means like buses, trains etc. With this increase there is also an increase in the data size to be handled which calls for a need for an efficient and effective system in place to accumulate this data, process it and project it when needed.
The Bus Management System (BMS) is a crucial component in the efficient operation of transportation services. This abstract presents an overview of the design and implementation of a database system for a BMS mini project. The primary objective of the project is to develop a comprehensive database that facilitates the management of bus routes, schedules, tickets, employees, and related information.
The BMS database makes use of SQL (Structured Query Language), PL SQL, programming and GUI interfaces in its designing and implementation. The following database comprises of numerous relations corresponding to every necessary aspect of a bus transportation system ascertaining to a location. The appropriate management of this data using a database management system enables smooth and efficient functioning and storage of important data.
In conclusion, the Bus Management System database presented in this mini project abstract serves as a foundational component for the efficient management of transportation services. By incorporating robust data management principles and technologies, the database facilitates effective bus routing, scheduling, and operational analysis, contributing to enhanced efficiency and customer satisfaction in public transportation systems.

TECH STACK USED

HTML, CSS, JavaScript, PHP, MySQL, Bootstrap.

ii)PROBLEM STATEMENT

Design a database for the local bus management association to help them maintain records of buses and routes and provide services.
Each bus is identified by an identification number mapped to the vehicle number. Buses are associated with brand and specifications. Buses offer a variety of features; however, a bus may have a limited number of features. The database handles records of drivers and conductors. The database also provides records of tickets. The database contains details pertaining to ownership. The database needs to store servicing and maintenance records. Records of routes are maintained. The database also stores information on depot.
The design should include an ER diagram, a set of relational schemas, and a list of constraints, including primary key and foreign key candidates.

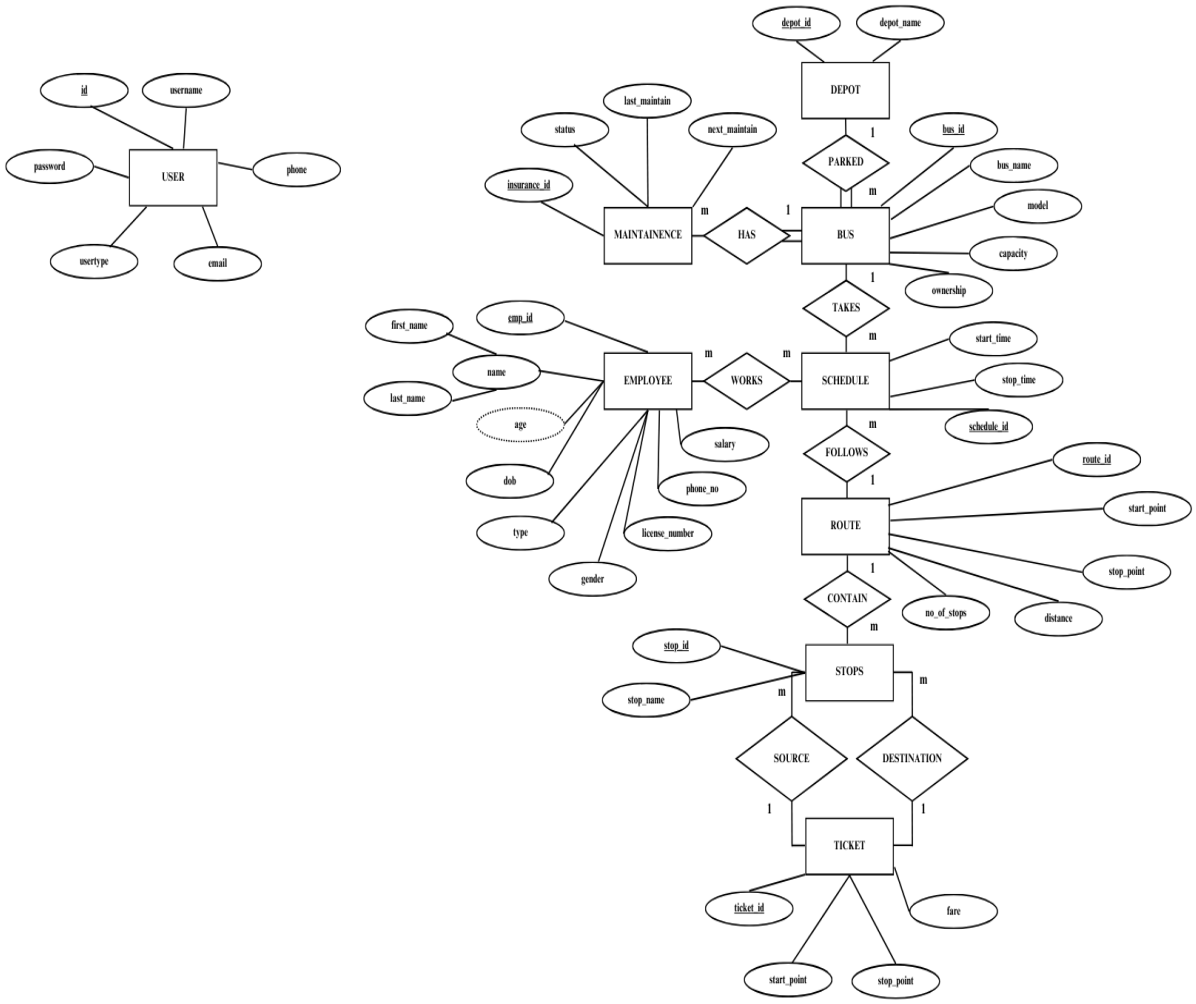
iii)FUNCTIONALITIES

The database performs the following functions:

- Stores the details of every new bus as well as existing bus. This includes the unique ID assigned to each bus, the number of seats, name of the bus, model, depot id etc.
- Details of the driver include name, gender, date of birth, mobile number, id, license number and salary etc.

- Details of the conductor assigned to each bus along with their personal details as mentioned for the driver.
- The arrival and departure of buses at their respective stops along with the start-stop time of a bus and routes taken.
- The details of the ticket based on distance travelled.
- Maintenance records of the bus.
- Ownership details of the bus
- Details on bus route changes.

iv)ER DIAGRAM



TABLES DERIEVED FROM THE ER DIAGRAM

user(id, username, phone, email, usertype, password)
depot(depot_id, depot_name);
bus(bus_id, bus_name, model, capacity, ownership, depot_id);
employee(emp_id,first_name, last_name, dob, type, gender, license_number, phone_no, salary)
route(route_id, start_point, stop_point, distance, no_of_Stops)
schedule(schedule_id,route_id,start_time,stop_time, bus_id, c_id, d_id)
maintainance(Insurance_id, bus_id, status, last_maintainance, next_maintainess)
ticket(ticket_id, source_id, destination_id, fare)
stops(stop_id, stop_name, route_id)
source(ticket_id, stop_id)
destination(ticket_id, stop_id)
contains_stop(stop_id, stop_name, route_id)
works(emp_id, schedule_id)

v)UNIVERSAL SCHEMA ATTRIBUTES

R={ticket_id,source_id,destination_id,stop_id,stop_name,route_id,fare,bus_id,bus_name,model,capacity,ownership,depot_id,depot_name,insurance_id,status,last_m,next_m,schedule_id,route_id,c_id,d_id,start_t,stop_t,start_pt,stop_pt,dist,no_of_stops,emp_id,f_name,l_name,dob,type,gender,licence_no,phone_no,salary}

vi)FUNCTIONAL DEPENDENCIES

ticket_id -> source_id
ticket_id -> destination_id
stop_id -> stop_name,route_id
route_id -> start_pt,stop_pt,dist,no_of_stops
ticket_id -> fare
bus_id -> bus_name,model,capacity,ownership,depot_id
depot_id -> depot_name
insurance_id -> bus_id,status,last_m,next_m
schedule_id -> route_id,bus_id,c_id,d_id,start_t,stop_t
emp_id -> f_name,l_name,dob,type,gender,licence_no,phone_no,salary
emp_id,schedule_id -> schedule_id,emp_id

vii)NORMALIZATION FORM - BCNF

viii)NORMALISED RELATIONAL TABLES WITH SAMPLE DATA

1) Depot

Depot ID	Depot Name
1	Udupi
2	Hebri
3	Katpady
4	Kundapura

2) Bus

bus_id	bus_name	model	capacity	ownership	depot_id
101	Mahakali	x450	50	private	1
102	KSRTC	s550	45	public	3
103	Ganesh	c720	35	private	3
104	Durgamba	t880	60	private	2
105	Anand Travels	e600	55	private	4
106	KSRTC	s551	45	public	4
107	Karavali	r700	50	private	1
108	Ambari	m660	60	public	2
109	Bharath	c520	40	private	3
110	APM	s770	60	public	1

3) Employee

emp_id	first_name	last_name	dob	type	gender	license_number	phone_no	monthly_salary
5001	Arjun	Nair	15-05-1990	d	m	KA78958798	9876543210	₹ 25,000
5002	Vikram	Nayak	20-09-1985	d	m	KA58486523	9012345678	₹ 28,000
5003	Rajesh	Shenoy	10-12-1988	d	m	KA84864651	8765432109	₹ 22,000
5004	Sanjay	Subramanium	25-04-1993	c	m	null	8901234567	₹ 30,000
5005	Venkat	Shetty	03-07-1987	b	m	KA78786533	7654321098	₹ 26,500
5006	Ganesh	Holla	12-01-1992	b	m	KA14892635	8123456789	₹ 27,500
5007	Rakesh	Bhat	18-06-1984	b	m	KA59756251	6543210987	₹ 23,500
5008	Vivek	Gopal	22-08-1973	c	m	null	7890123456	₹ 29,000
5009	Sashikala	Ganapathy	12-04-1970	d	f	KA12328999	7012345678	₹ 24,500

4) Route

route_id	start_point	stop_point	distance	no_of_stops
10	Udupi	Karkala	37	12
11	Udupi	Kundapura	38	14
12	Udupi	Manipal	4	9
13	Manipal	Kundapura	43	16
14	Udupi	Bhramavar	14	7
15	Bhramavar	Hebri	28	10
16	Udupi	Hebri	42	10
17	Udupi	Herga	12	13
18	Udupi	Manchi	9	15
19	Manipal	Manchi	5	6
20	Manipal	Petri	20	10
21	Udupi	Mattu	12	13

5) Schedule

schedule_id	route_id	start_time	stop_time	bus_id	c_id	d_id
101	10	60000	62010	101	5004	5001

102	21	70000	81000	105	5008	5006
103	11	83000	91619	110	5005	5010
104	20	94000	104727	109	5007	5020
105	12	105500	101735	107	5019	5017
106	19	115000	144823	107	5018	5002
107	13	123500	155810	106	5015	5016
108	18	140000	162000	104	5011	5014
109	15	151500	162500	102	5005	5006
110	17	163000	174510	104	5008	5007

6) Ticket

TICKET ID	SOURCE ID	DESTINATION ID	FARE
100104	1001	1004	46
100105	1001	1005	62
100106	1001	1006	77
100107	1001	1007	93
100108	1001	1008	108
100109	1001	1009	123
100110	1001	1010	139
100112	1001	1012	170
100204	1002	1004	31

7) Maintenance

insurance_id	bus_id	status	last_maintain	next_maintain
2001	101	active	15-03-2024	15-09-2024
2002	102	active	20-02-2024	20-08-2024
2003	103	active	01-01-2024	12-07-2024
2004	104	active	10-01-2024	10-07-2024
2005	105	inactive	05-06-2023	31-12-2023
2006	106	active	01-01-2024	12-07-2024
2007	107	active	10-01-2024	10-07-2024
2008	108	active	25-03-2024	25-09-2024
2009	104	inactive	01-02-2023	07-07-2023
2010	110	active	15-03-2024	24-09-2024
2011	109	active	22-02-2024	10-07-2024
2012	108	inactive	01-04-2023	07-10-2023

8) Stops

stop_id	Stop_name	Route_id
1209	Manipal	12
1313	Kumbhashi	13
1009	Hiriyadka	10

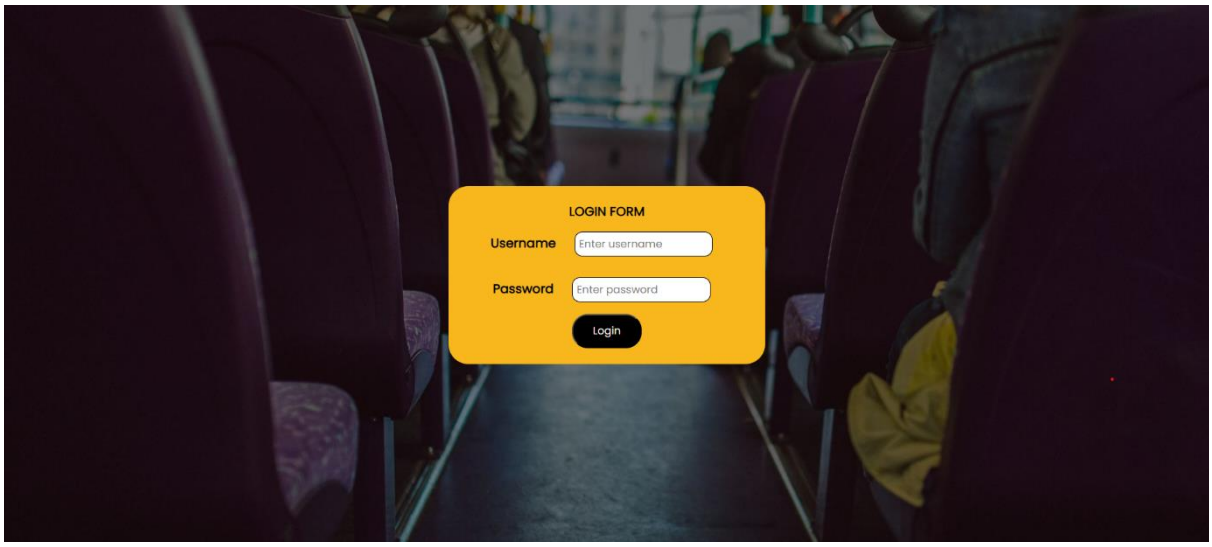
1508	Karje	15
1712	Gatson	17
2008	Kukkehalli	20

ix)SOURCE CODE LINK FOR DDL COMMANDS, SQL QUERIES, PL/SQL PROCEDURES/FUNCTIONS/TRIGGERS AND CODE –

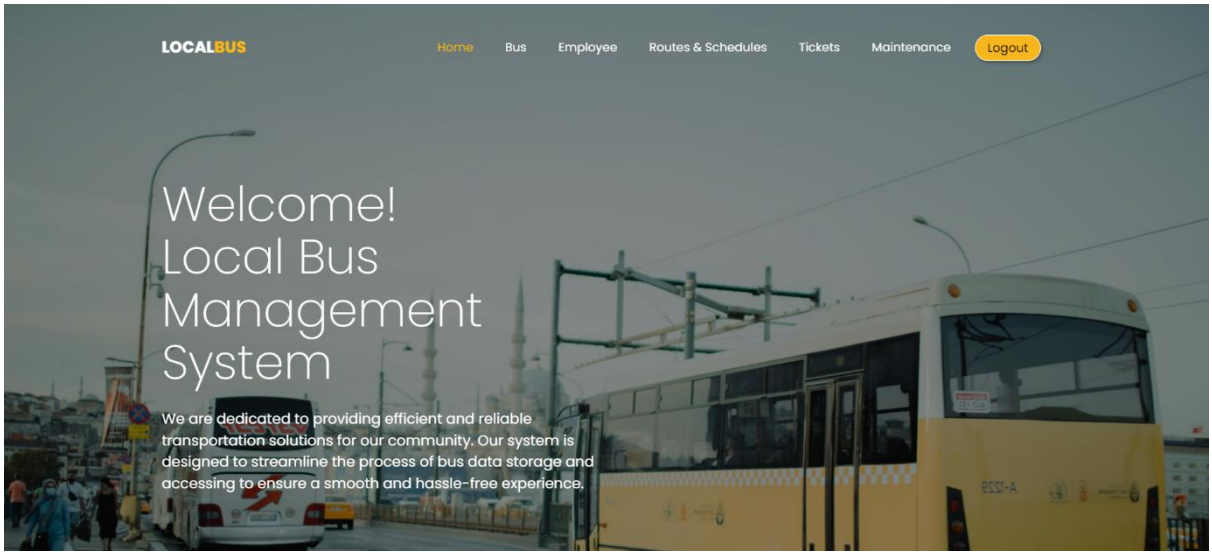
https://github.com/spacedust26/bms

x) UI DESIGNS

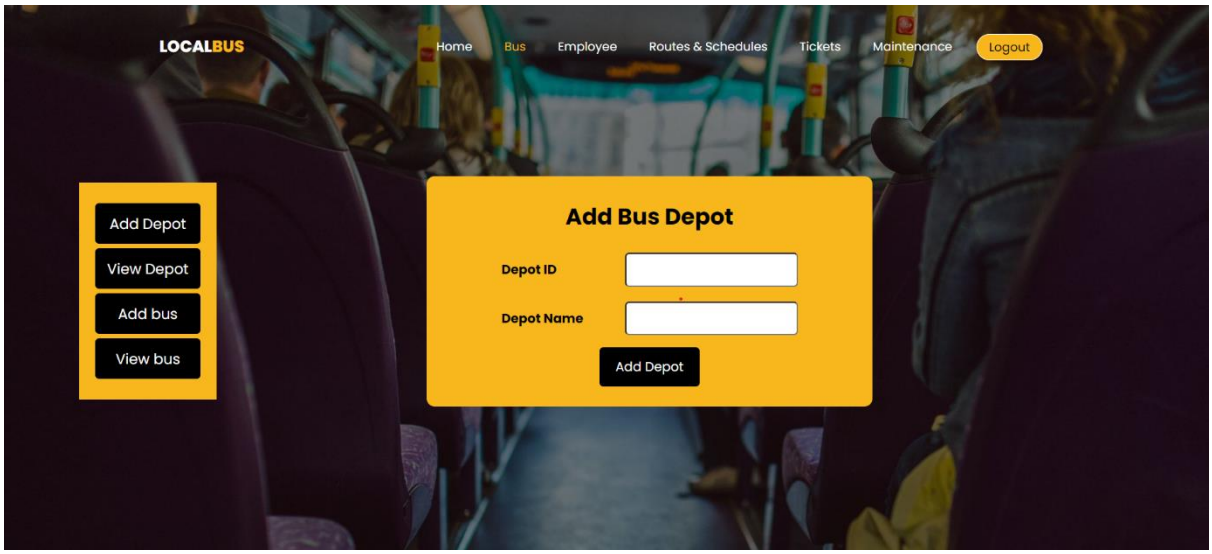
Login page



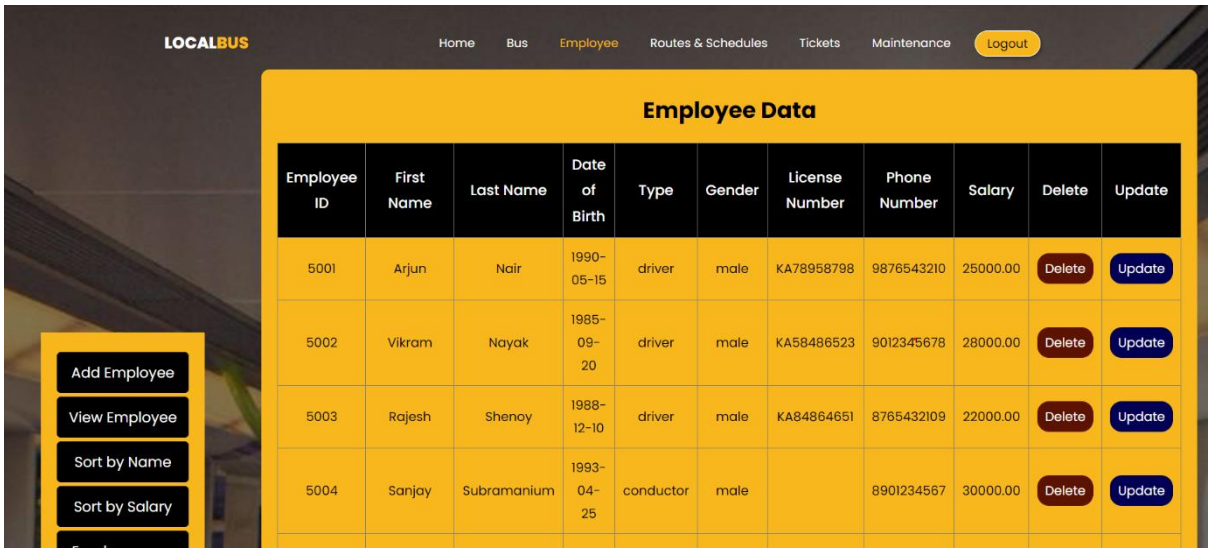
Home page



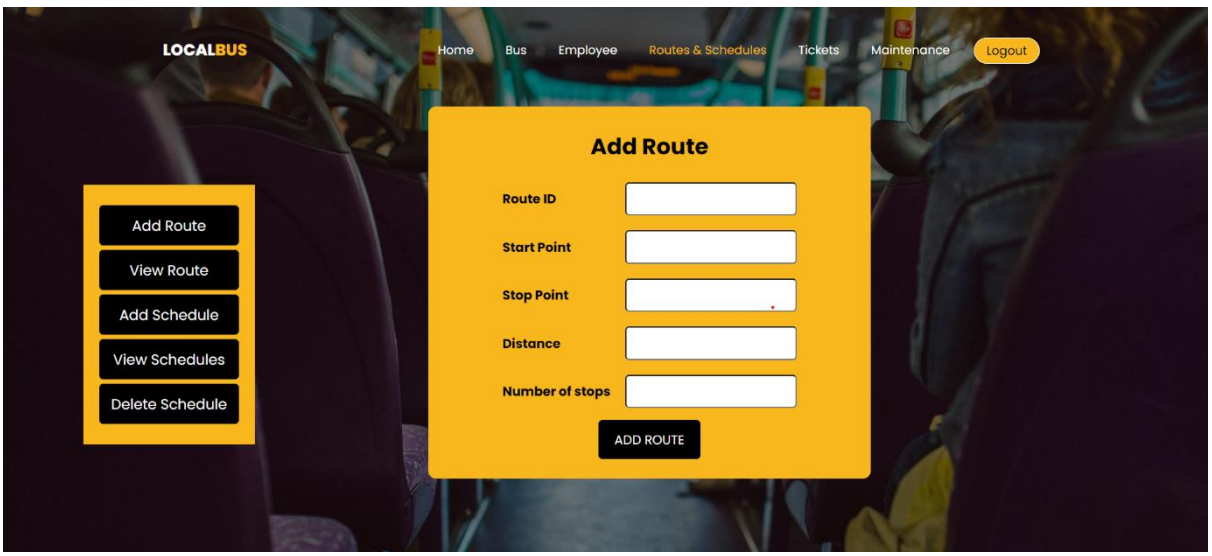
Bus tab



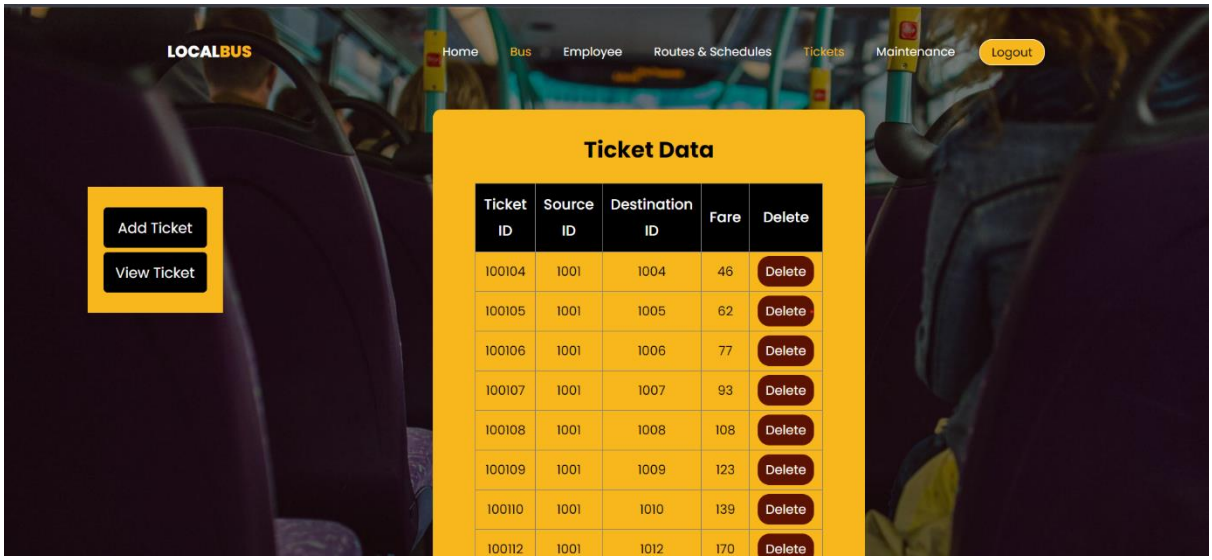
Employee tab



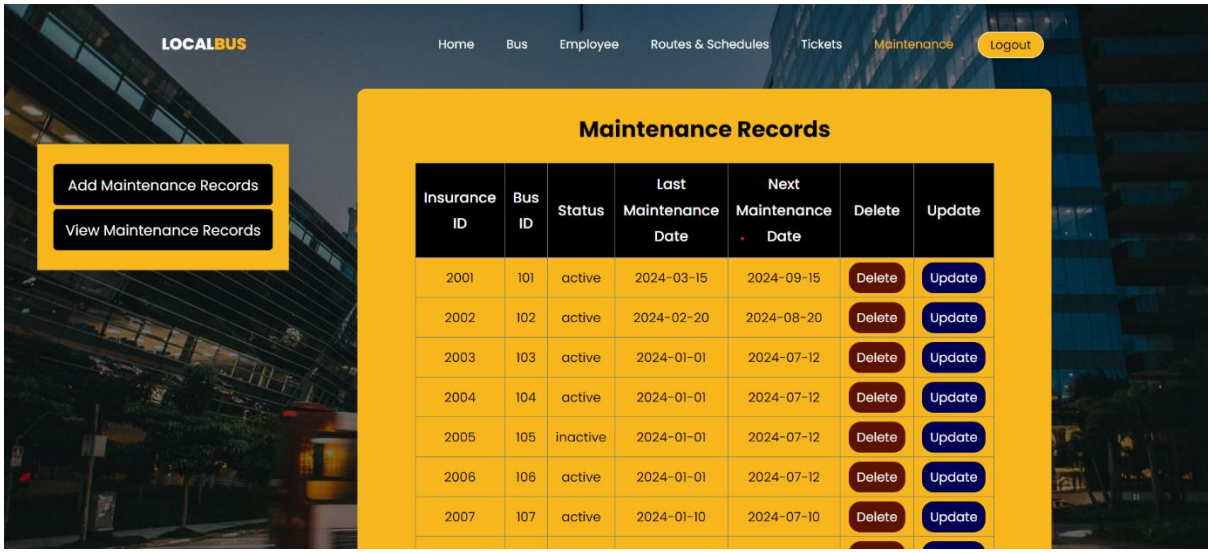
Routes and Schedules tab



Tickets tab



Maintenance tab



XI) REFERENCES

https://www.redbus.in/buses/udupi-bus-tickets
https://www.mariadbtutorial.com
https://stackoverflow.com/