Train Management System Report

# Group Members

• Mashood Zahid (Reg ID: 2312125)  
• Hasnain Sajjad (Reg ID: 2312111)

# Train Management System Summary

The Train Management System is a comprehensive database solution designed to manage and organize various operations of a railway network. It efficiently handles data related to trains, stations, routes, schedules, passengers, tickets, payments, coaches, and cancellations. The system aims to streamline railway operations and improve the accuracy and reliability of data handling for bookings, train schedules, and customer services.

# Tables Summary

## Stations

Stores details of all railway stations including station ID, name, unique code, and location.

## Trains

Maintains information about each train such as train number, name, type, and seating capacity.

## Routes

Defines each route by connecting a start station to an end station along with the total distance in kilometers.

## Route Stations

Breaks down each route into individual stops with stop numbers to maintain the correct travel sequence.

## Schedules

Handles the scheduling of trains on particular routes, recording their departure and arrival times.

## Passengers

Contains passenger details including name, email, and phone number, providing identification for bookings.

## Tickets

Manages ticket bookings with assigned seat numbers, passenger details, and timestamp of booking. Ensures unique seat assignment per schedule.

## Payments

Records payment transactions for tickets, including amount, method, status, and timestamp of payment.

## Train Coaches

Details the composition of each train in terms of coaches, their class type, number of seats, and base fare per seat.

## Cancellations

Manages ticket cancellation data, capturing reason, refund amount, status, and timestamp of the cancellation.

## Train Schedule Report (View)

A read-only view summarizing scheduled train journeys along with train and station information to support reporting.

# Problems This System Solves

- Eliminates manual errors in schedule and ticket management.  
- Prevents seat duplication through system-enforced constraints.  
- Tracks payments and cancellations for transparency and auditing.  
- Organizes complex route and station data for streamlined train operations.  
- Enhances customer service by managing real-time schedules and ticket availability.  
- Offers flexibility to handle different coach types and fare structures.

# Conclusion

The Train Management System provides a reliable and efficient way to manage the key components of a railway network. It integrates passenger, train, route, and financial data to ensure smooth operations and enhance service quality. By automating routine tasks and maintaining data integrity, the system significantly reduces administrative overhead and supports better decision-making for railway operations.

# Entity-Relationship Diagram (ERD)

