CS2202 Mini Project: Indian Railway Ticket Reservation System

Date: 10th Mar 2025 **Due: 14th Apr 2025**

Goal:

The goal of this mini project is to provide a realistic experience in conceptual design, logical design, implementation, operation, and maintenance of a small relational database for an Indian Railway Ticket Reservation System.

Application Description:

The application is a railway ticket reservation system that allows passengers to book, modify, and cancel tickets. The system also tracks train schedules, seat availability, and payments. Following are the

Key Features:

- Passengers can book tickets for available trains.
- Tickets can be booked under different classes (Sleeper, AC 3-tier, AC 2-tier, First Class, etc.).
- Seat availability and PNR status tracking.
- Waitlist and RAC (Reservation Against Cancellation) system.
- Online and counter ticket bookings with different payment modes.
- Train schedules, routes, and stations management.
- Cancellation and refund processing.
- Concession categories for senior citizens, students, and disabled passengers.

Project Requirements:

1. E-R Model

- Construct an **E-R diagram** representing the conceptual design of the database.
- Identify **entities** such as Passenger, Train, Ticket, Payment, Route, Station, Seat, and Class.
- Define **relationships** such as "Passenger books Ticket", "Ticket is for Train", "Train has Schedule", "Ticket is paid via Payment", etc.
- Specify **primary keys, foreign keys, relationship cardinalities, and constraints**.

2. Relational Model

- Convert the E-R model into relational schema.
- Normalize relations based on relational design principles.
- Implement the schema in **MySQL**.
- Define **keys**, **constraints, indices, procedures, functions, and triggers** as necessary.

3. Populate Relations

- Populate the database with enough sample data.
- Generate input data using scripts if needed.

4. Potential Queries

You need to implement various queries that provide insights into the railway ticket system. Some examples include as follows:

- **PNR status tracking** for a given ticket.
- **Train schedule lookup** for a given train.
- **Available seats query** for a specific train, date and class.
- **List all passengers traveling on a specific train on a given date.**
- **Retrieve all waitlisted passengers for a particular train.**
- **Find total amount that needs to be refunded for cancelling a train.**
- **Total revenue generated from ticket bookings over a specified period.**
- **Cancellation records with refund status.**
- **Find the busiest route based on passenger count.**
- **Generate an itemized bill for a ticket including all charges.**

5. Deliverables

Project Documentation File (CS2202_MiniProject_GroupNo.pdf):

- **ER Diagram** with descriptions.
- **Relational schema** and normalization process.
- **Sample data** summary (e.g., `SELECT COUNT(*)` on each table).
- **SQL queries, procedures, functions, indices, triggers**.
- **Other interesting queries beyond the required ones.**

Supporting Files:

- All supporting **CSV data files**.
- **README.txt** file with setup instructions.
- **SQL files**

Video Demonstration (10-15 minutes):

- Overview of the **ER Diagram and relational schema**.
- Running queries on the **populated database**.
- Demonstration of **procedures, functions, and triggers**.
- Explanation of additional queries implemented.
- Share the **video demonstration link** upon submission.