

# Indian Railway Reservation System (IRCTC) - SQL Project Report

## 1. Objective

This project demonstrates an Indian Railway Reservation System using SQL. It manages stations, trains, passengers, tickets, payments, and implements foreign key relationships, waiting list logic, and data integrity rules.

## 2. Database Tables

Table	Description
STATION	Stores station details (station_id, name, city).
TRAIN	Stores train details with source & destination stations.
PASSENGER	Stores passenger personal details.
TICKET	Stores booking details with seat and status.
PAYMENT	Stores payment details linked to tickets.

## 3. Key Concepts Used

- Primary Keys for unique identification
- Foreign Keys to maintain relationships
- Waiting vs Confirmed ticket logic
- Triggers for automatic seat assignment
- COMMIT / ROLLBACK for transaction control

## 4. Foreign Key Flow

STATION → TRAIN → TICKET ← PASSENGER → PAYMENT  
This flow ensures referential integrity and prevents invalid data.

## 5. Waiting List Logic

If confirmed seats reach the train's total seat limit, new tickets are marked as WAITING with seat number 0. Otherwise, tickets are CONFIRMED and seat numbers are auto-assigned via trigger.

## 6. Conclusion

This SQL project simulates a real-world IRCTC system using proper database design, constraints, and logic. It is suitable for academic submission and interview discussions.