Railway Management System (PL/SQL Project)

○ Project Overview

This project is a Railway Management System built using Oracle PL/SQL.

It manages:

- Passenger ticket bookings
- Waitlisting
- Ticket cancellations
- Automatic seat assignment
- Booking expiry after train departure

It uses Tables, Procedures, Functions, Triggers, and Sequences to simulate real-world railway operations.

○ Database Structure

Tables:

- Stations: Stores station names
- Trains: Stores train details (source, destination)
- Train_Sch: Arrival and departure timing for trains
- Passengers: Passenger information
- Bookings: Ticket booking information
- Waitlist: Waitlisted passengers

Sequences:

- booking_seq: Auto-generate booking IDs
- waitlist_seq: Auto-generate waitlist IDs

Core Features

- Ticket Booking: Auto seat allocation if available.
- Waitlisting: Auto add to waitlist when train is full.
- Ticket Cancellation: Cancel ticket and auto-assign seat to next waitlisted passenger.
- Booking Expiry: Automatically expire bookings after train departure.
- Seat Management: Proper seat numbers assigned sequentially.

○ PLSQL/Objects

- check_seat_availability (Function): Check available seats
- book_ticket (Procedure): Book a seat or waitlist
- cancel_ticket (Procedure): Cancel a booking and manage waitlist
- booking_expiry_trigger (Trigger): Expire old bookings automatically

How to Run

- Create all required tables and sequences.
- Create all functions, procedures, and triggers.
- Insert initial sample data (stations, trains, passengers).
- Run provided test_cases.sql script to test all features.
- Verify output using select queries.

Sample Queries

- Check Available Seats

SELECT check_seat_availability(103) FROM dual; - Check Booked Passengers

SELECT * FROM Bookings WHERE train_id = 103; - Check Waitlist

SELECT * FROM Waitlist WHERE train_id = 103;

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