Railway System Database

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Introduction

Welcome to the Railway System Database, a comprehensive solution designed to manage and streamline the operations of a railway network. This database serves as the backbone for efficient and organized railway management, covering essential aspects such as stations, trains, passengers, tickets and users.

Data Entities

Stations:

Stations are physical locations where trains arrive and depart. Each station has a unique identifier known as the StationID. Additional details associated with each station include its name, geographical location, number of platforms, and capacity metrics. These attributes provide key information about the infrastructure and throughput capabilities available at each stop along the rail network.

Trains:

Description: Trains are the heart of the railway system. Each train is identified by a unique TrainID and has associated attributes such as TrainName, MaxSpeed, CurrentStatus, and references to departure and arrival stations.

Passengers:

Passengers are the individuals using the railway services. Each passenger is identified by a unique PassengerID and has personal details including FirstName, LastName, DateOfBirth, Email, Phone, and Address.

Tickets:

Tickets capture the details of a passenger's journey. Each ticket is uniquely identified by a TicketID and includes information such as PassengerID, TrainID, DepartureStation, ArrivalStation, DepartureTime, ArrivalTime, TicketPrice, BookingTime, SeatNumber, and UserID.

Users:

Users represent individuals who interact with the system. Each user is identified by a unique UserID and has a username, password, and is associated with a specific role.

Roles Description:

Roles define the permissions and access levels of users within the system. Each role is identified by a unique RoleID and has a name.

User (Actors)

Administrator:

Administrators have full access to the system, enabling them to manage stations, trains, passengers, tickets, users, and roles. They can perform tasks such as adding new stations, updating train information, and managing user roles.

Customer:

Customers are passengers who use the railway services. They can view train schedules and book tickets.

Processes

Ticket Booking Process

1. Customer Interaction:

* Customers access the system to view train schedules and available seats.
* They provide journey details and select preferred trains.

1. Booking Confirmation:

* The system validates availability and confirms the booking.
* A unique ticket is generated with details like seat number, departure, and arrival times.

1. Payment (if applicable):

* Customers make payments for their booked tickets.

1. Ticket Issuance:

* The system issues the confirmed ticket to the customer.

Station Management Process

1. Administrator Interaction

* Administrators access the system to manage station information.
* They can add new stations, update existing details, and ensure accuracy.

1. Train Schedule Management:

* Administrators update train schedules, including departure and arrival times at each station.

1. Capacity Planning:

* Administrators monitor station capacities and make adjustments as needed to accommodate passenger demand.

User Management Process

1. Role Assignment:

* Administrators assign roles to users based on their responsibilities.
* Roles define the level of access and permissions within the system.

1. User Registration:

* New users register in the system with a unique username and password.

1. Authentication and Authorization:

* The system verifies user credentials during login.

This database is designed to enhance the efficiency and reliability of railway operations, providing a user-friendly interface for passengers and robust management tools for administrators. The interconnected data entities, user roles, and defined processes ensure a seamless railway experience for all stakeholders.