

Railway Ticket Reservation System

You are tasked with developing a railway ticket reservation system for a busy rail network. The system should handle ticket booking, seat availability, and generate reports for the railway administration. Your task is to implement a Python program that provides the following functionalities:

Load Train Data: The program should read the train data from a CSV file named "trains.csv." Each row in the CSV file represents a train with the following information:

- Train ID (a unique alphanumeric code)
- Train Name
- Source Station
- Destination Station
- Total Seats (total number of seats available on the train)

Load Passenger Data: The program should read the passenger data from a CSV file named "passengers.csv." Each row in the CSV file represents a passenger with the following information:

- Passenger Name
- Train ID (the ID of the train the passenger wants to book a ticket on)
- Number of Tickets (the number of tickets the passenger wants to book)

Check Seat Availability: Given the train ID and the number of tickets requested by a passenger, the program should check if there are enough seats available on the specified train for booking. If seats are available, the booking should be confirmed, and the total fare for the booking should be calculated as per the fare rules (you can define fare rules based on distance, class, etc.).

Update Seat Availability: After confirming the booking, the program should update the seat availability for the corresponding train.

Generate Reports:

Report 1: The program should generate a report showing the details of all the trains, including their names, source stations, destination stations, and the total number of seats available on each train.

Report 2: The program should generate a report showing the total revenue earned from each train based on the total number of confirmed bookings and their respective fares.

Handle Errors: The program should handle various types of errors gracefully, such as invalid train IDs, invalid passenger names, insufficient seats, etc., and provide appropriate error messages.

Note:

You can assume that the passenger data in "passengers.csv" will not exceed the available seats on any train.

You can design the fare rules based on your preference and mention them clearly in the program.

Write the Python program to implement the above functionalities for the railway ticket reservation system. Use comments to explain each step of your implementation and provide sample CSV files ("trains.csv" and "passengers.csv") for testing the program.

Sample data-

Train.csv

Train ID	TrainName	SourceStation	DestinationStation	TotalSeats	fareperseat
T123	Express 123	City A	City B	200	500
T456	Superfast 456	City B	City C	150	1200
T789	Shatabdi 789	City C	City D	100	1400
T321	Intercity 321	City D	City E	180	200
T654	Rajdhani 654	City E	City F	250	1500

Passenger.csv

Passenger Name	TrainID	Number of Tickets
John	T123	2
Alice	T321	1
Bob	T789	4
Eve	T456	3