CMPS664 Project#1

Airline reservation system

Create a seat reservation system for an Airline. Plan flight schedules between airports based on the PNR data to <u>accommodate maximum passengers maintaining a high average seat occupancy rate per day</u>.

The Airline operates direct flights between any two airports listed in IATA.txt file.

Entities

- Passenger
- Class
- Seats
- Airports
- Flights
- Reservations
- Checkin

Rules and Operations

1. **Passengers** are identified by passenger ID and can be retrieved with all personal information given in the PNR file.
2. **Seat** arrangements are defined for each **Class**, have a seat number such as 1A, 33F for different classes (Economy, Business, and 1st Class). Each flight has 50 First class, 100 Business class and 150 Economy class seats .
3. **Airports** are identified by IATA codes
4. **Flights** departure time, Origin (airport code), Destination (airport code)
5. **Reservations** Assign npass seats to each passenger. Write the function reserve_seat that implements a reservation. All reservations must be made on a

First Come First Served basis. <u>Allow automatic upgrade to the next available upper level class or downgrade to the next available lower level class if the requested class is full to accommodate all co-passengers</u> (i.e. if a passenger requested for the economy class and the requested economy class is full and there are vacant seats in the business class then reserve npass business class seats for the passenger. Similarly, if a passenger requests for the first class and there are no available seats in the first class and business class but there are vacant seats in the economy class then reserve npass economy class seats for the passenger). Allow distant seats for co-passengers (i.e. if a passenger requested for 10 first class seats and only 4 are available, then assign those first class 4 seats to the passenger and assign the remaining 6 seats from other available class to the passenger).

6. **Seats on flights** Available seats are defined from the **Class Type**.
7. **Check-in** is performed for a reservation and must be within 24 hours before the flight but not after.

Data

PNR information -
https://drive.google.com/file/d/1JpTAGKxD03UxXTqfCumZJAvCTlr-l9j8/view?usp=sharing

IATA list -
https://drive.google.com/file/d/1uJyioEBiJ8N6QaFaiGme1wfUnwWkicpx/view?usp=sharing

Use the passenger data PNR.xml to make a reservation. There are 10 fields in this dataset -

firstname - Firstname of the passenger
lastname - Lastname of the passenger
address - Address of the passenger
age - Age of the passenger
source - Source IATA code
dest - Destination IATA code
travelDate - Date of travel

class - Requested class (i.e. First, Business, Economy).

bookingTime - Time when the passenger requested for the ticket

npass - Number of passengers flying with the primary passenger (provided firstname, lastname, age and address) For this project we do not include "relative" table storing the information of

passengers who are flying with the primary passenger. We reserve npass seats for the primary passenger.

Example Queries

Write the following 4 queries.

1. Show the flight schedule between two airports between two dates.
2. Rank top 3 {source, destination} airports based on the booking requests for a week.
3. Next available (has seats) flight between given airports.
4. Average occupancy rate (%full) for all flights between two cities.

Limitations

1. We do not consider information about co-passengers who are flying with the "main passenger".
2. We do not include flight ticket prices.
3. If we do not have seats available in requested class or next upper level class for a passenger, we cancel their reservation (i.e. we do not schedule them for another date).

Project demonstration:

Students will demonstrate their project implementation on a pre-assigned date.