Database Management System

Project
on
Bus Reservation System

Problem statement:

After spending two weeks in Arlington, Texas, we found out that the transport via bus is not very well established here. Students often need to visit the Indian stores, Walmart, banks and other places for which they need to book a Cab like Via, Uber, or Lyft. All these modes of transport are expensive for students. Hence, we thought of developing a BUS reservation system for the city of Arlington. The Bus Reservation database System will store the data Passengers, Bus stops, Employees.

To design a database for real time scenario it is too hard due to that we added some limitations

- In a single session a passenger can only book multiple tickets for a single route.
- At a given time a passenger can select only one schedule.
- The capacity of each bus is 30.
- For a given schedule we can have a minimum of 0 passengers and a maximum of 30 passengers.
- Every schedule will have only a single route whereas a route can have multiple schedules.
- The bus will run only if the minimum number of bookings are 5 and the seats will be allocated randomly.
- Mode of payment will be online such as zelle,paypal,amazon pay,google pay
- Bus fare will depend on the distance covered between source and destination points like 1.5$/mile.
- There will be no delays from one stop to another.
- Each route will have both AC and Non AC buses.
- Each bus will always have a fixed route.
- A bus can run 5 times on the route in a day
- One bus can only run on one route.

Data Requirements:

Passenger :

- The Database will have all personal information of the passengers. Each passenger has a Passenger ID, Name(Fname, Lname), Date of Birth(Age), Gender, Phone Number(primary,secondary), Email ID, Address(Street, Zip code) .
- Database also stores the type of bus passenger has been booking.

Bus :

- Each Bus has a unique id, type of bus.
  Here each bus has a capacity of maximum 30 days and type of bus as Ac, Non Ac buses.

Route :

- Each route has a unique route id, source point , destination point point .
- Route also captures the distance between source and destination and the fare will be calculated based on this distance.
- At Least one bus will be available on one route

Scheduler :

- Each route has a unique Schedule id, date, time, available seats.
- We will calculate available seats based on total capacity and number of tickets booked

Employee :

- Each employee has a unique Employee ID, Name, Date of Birth, Gender, Phone Number, Email ID of the employee.
- One employee can work on multiple schedules.

Tickets :

- Each ticket has a transaction id and its mode of booking.
- As passengers booked the ticket we captured the date ,time and number of tickets.

Business goals:

1. By looking at the number of bookings made and bus schedule, we can get information regarding which routes are most and least travelled by passengers, which can be used to increase or decrease the bus frequency for those routes respectively.
2. With the help of zip codes of passengers we can figure out new locations where new Bus stops can be set up or existing Bus stops can be removed/shifted.
3. Which type of bus is most preferred by passengers(AC or Non AC)?
4. Bus stops will provide information regarding which bus stops have the most traffic. Which bus stop has the most number of passengers?

5. Frequent travelling passengers can be prompted to get a Bus pass by finding the maximum number of times the passengers travels a particular route.
6. The types of payment methods used by passengers while booking seats can be used to offer certain discounts and offers to attract new customers. Which type of payment method is most used?
7. Using booking details, it is possible to collect information about the time and day of the week on which most bookings are being made. Around which time period most tickets are being booked?