Project

MC 212 – Database Management System

Student name : Aditya Shah

Student I.D. : 202003045

Project Title : Airline Management System

Scope of Database : We are making a database for a user so that he/she can book tickets for any destination from any airport. They can compare prices of different airlines and book their flight for suitable dates. The database also shows arrival & departure time with some additional information about their arrival and departure airport. While booking tickets user can choose the flights with or without junctions and also user can see flying time of their journey.

Description/Requirements :

- Airplane has attributes like seating capacity and airplane number.
- Seat has availability status, class, Location and seat number.
- A user books tickets for multiple travellers and is an independent entity unlike traveller.
- User and traveller have attributes like Name, ID, and contact number.
- And there is a entity flight trip which has arrival and departure time and airport with no of traveller and some id associated with the journey which will be different for different journey. It also has an attribute total fly time. It calculates all the junctions and stuff.
- Junction has attributes like junction name, code of the junction and arrival and departure time and airport with waiting time at junctions also.
- Airline Company has attributes like company id and company name.
- There is an entity Fare which has attributes as follows. Currency, amount, discount, tax and Final Amount with calculating everything.
- There are relations Arrival and Departure. Both contains two attributes arrival time and place. And departure time and place.

- Airport has airport name, code of an airport, Full address.
- Each airplane have some seat capacity and also some airplane number which is the key/unique attribute for that airplane.
- The access to an airport is dependent on airplane and not on any airline company. An airport can give access to multiple planes and a plane can have access to multiple airports also.
- Every airline company owns multiple planes and every plane must belong to a company. Also one plane belong to only one unique company.
- Seat reservation is the basic step of ticket booking in airplanes. So every seat belong to an airplane.
- All airplane has some unique numbers. Also every seats in an airplane also has some seat number which is unique for that airplane.
- We introduce an entity called traveller who occupies the seat.
- Each traveller must have a seat. However, seats can be empty so it is not necessary that every seat belongs to a traveller. But visa versa is true.
- a flight trip is a journey with all possible details against traveller.
- Each flight trip has a fare and obviously, a fare cannot be defined without a flight trip.
- Junction is the breaks in the journey. So when we are going to city Z from a city X and in between there is Y which is a junction. So here there are two Junctions one is X to Y and another one is Y to Z. in a journey there must be one or more than one Junctions.
- Each trip can have multiple Junction and a Junction has a base fare. When a user books a flight trip, the total fare can be calculated as the sum of the fares of all the Junction -fares minus discount.
- Traveller and fare cannot exist without a trip and a trip has one fare and multiple travellers.

Entity :

- Airplane
- Seat (Weak Entity)
- Airport
- Traveller (Weak Entity)
- Flight Trip

- Fare (Weak Entity)
- Airline Company (Weak Entity)
- Travel Agent
- Junction
- User

Relationship :

- Airport – Airplane, Relation –access, Relation Type- many to many relation.
- Airport – Junction, Relation – arrival, Relation Type – one to many relation.
- Airport – Junction, Relation – departure, Relation Type – one to many relation.
- Airplane – Seats, Relation- has ,Relation Type – one to many relation.
- Seats- Traveller, Relation- reserved , Relation Type – one to one relation.
- Traveller – Flight Trip , Relation- Travels ,Relation Type – many to one relation.
- Flight Trip – Fare, Relation- costs ,Relation Type – one to one relation.
- User – Flight Trip, Relation- books ,Relation Type – one to many relation.
- Travel Agent –Flight trip, Relation-books, Relation Type – one to many relation.
- Flight trip – Junction, Relation-has, Relation Type – many to many relation.
- Airplane – Junction, Relation- joints, Relation Type – one to many relation.
- Fare –Airplane Company, Relation –of ,Relation Type – one to many relation.

Query :

- Which is the busiest airport in the last 30 days?
- Which age group has booked maximum number of tickets in last 90 days?
- Which airplane company has provided maximum discount percentage?

- Which travel agent company has booked maximum tickets in the month of July?
- Given a airplane, retrieve name of all the passengers who have travelled for more than 24 hours per week.
- Retrieve total number of hours airplane id has travelled in a week.
- List the name of top 10 passengers which have travelled maximum no. of hours in month of July.
- List the name of top 5 airplanes which flew for maximum no. of hours in month of July.
- List the I'd of airplanes which were booked maximum in month of July.
- List the I'd of airplanes which were booked minimum in the month of July.