CS251

Database Systems

Assignment – Mini Project

Airline Reservation System

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Introduction to our project

Problem definition

Airline Reservation system is very important because it has the strong ability to reduce errors that might have occurred when using a manual system of reservation and helps speed up the boarding process. It basically eliminates all the obstacles that the customer or passenger might face during manual reservations of airlines or during the conventional method of booking the tickets which have lots of constraints and doesn't provide the passenger many facilities. The Airline Reservation System (ARS) provides an interface to schedule flights and reservations for an airline. Its responsibility is to keep track of system users, customers, Airline information, flight information, and cancellation.

Overview

Airline reservation system is one of the most used database systems in the world. It is basically a type of transaction processing system. Transaction processing systems are systems with large databases and multiple concurrent users executing database transactions. These systems require high availability and fast response time for multiple concurrent users.

In this project, we deal with the database part of the whole system with insertions, deletions and updates as the primary task of our system along with maintenance of the integrity of the system at all stages of a transaction.

OBJECTIVES OF AIRLINE RESERVATION SYSTEM

- Improve accuracy.
- Result to be received very quickly.
- It uses concept of user friendliness.
- It allows multiple applications to be used at a time.
- Increased security, speed, storing and accuracy.
- Customer services can not only be satisfied but also enhanced to the extent that one can obtain or cancel a reservation from any branch for any route at any given time.
- To speed up the operation.
- Managing and maintaining data becomes easier.
- Provide convenience to travelers.
- It decreases manpower and high cost.

ADVANTAGES OF AIRLINE RESERVATION SYSTEM

- ✓ The proposed system due to computerization is much faster in reservation process, cancellation process and transactions.
- ✓ Transfer of information from various branches would become easier and faster.
- ✓ Managing and maintaining data becomes easier and cost effective due to very high amount and reliability of storage space available in the proposed system.
- ✓ Customer services can not only be satisfied but also enhanced to the extent that one can obtain or cancel a reservation from any given time.

Elements of solution

We designed the database for our **Airline Reservation System** that facilitates or provides the passenger with all the necessary services in order to make their trip convenient and free from any difficulties or obstacles, some of them are listed below –

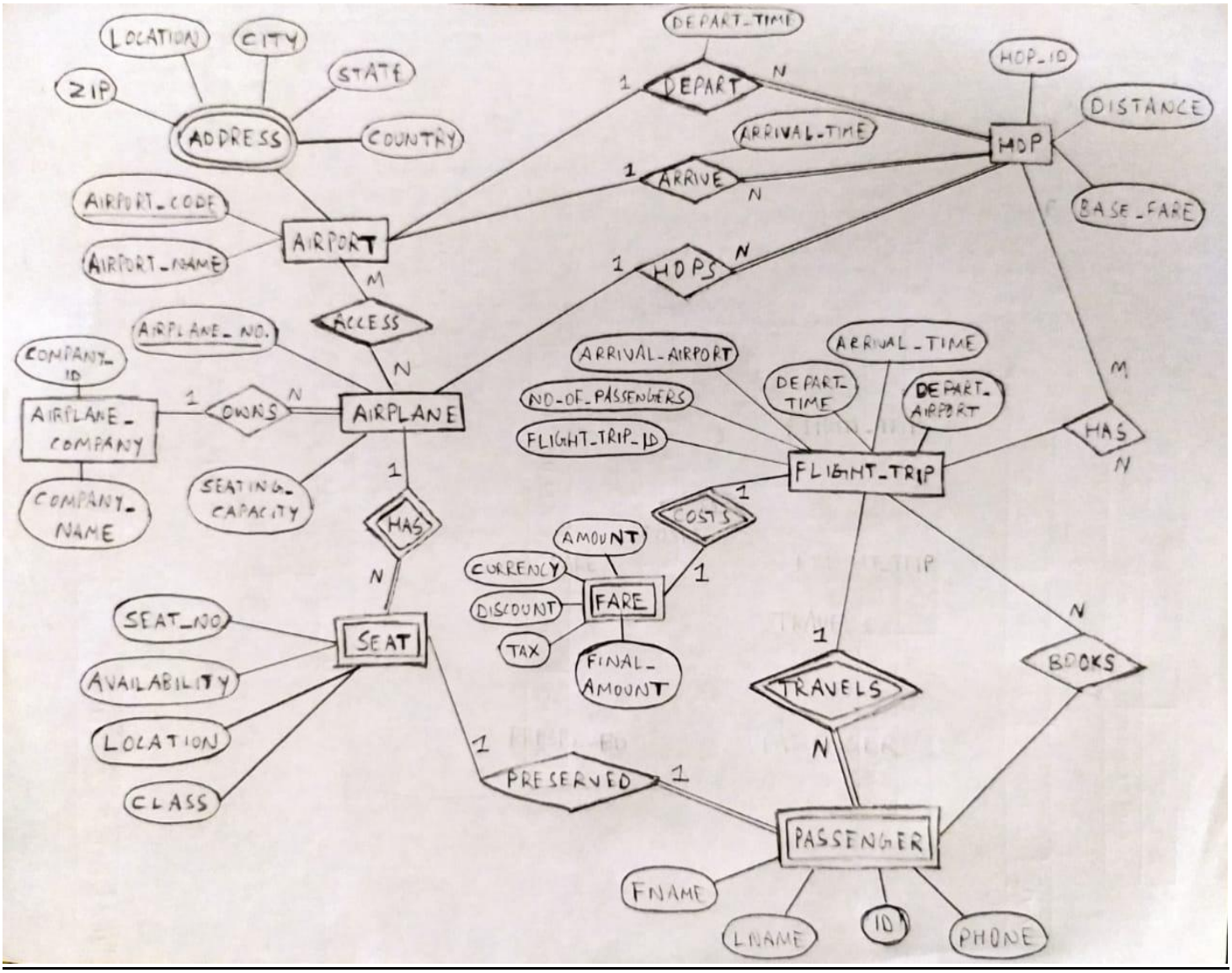
- Modern and flexible inventory management solutions
- Internet ticket sales and booking facilities
- Secured online payment management facilities
- Flight booking system of all sizes
- Convenient cancellation of the tickets with proper refunds
- And all the facilities that ease the process of reservations

RELATIONSHIP ASSUMPTIONS FOR ER-DIAGRAM

So based on the requirements we have selected the appropriate entities, its attributes and the desired relation between them for our DBMS Model. And further based on that, we have designed the Entity- Relationship Model and applied all the E-R mapping rules. Some of the assumptions that we have taken for designing our E-R models are listed below.

- An airline company can own many flights, but no flights can be without an airline company. Internet ticket sales and booking facilities
- Address is a multi-value attribute.
- Multiple flights can land on an airport and also multiple airports can handle multiple flights.
- A flight-seat cannot exist without a flight.
- A single seat will be reserved for a single passenger.
- A passenger can have multiple flight trips and there is no passenger without a flight trip, i.e., if there is no flight trip, there won't be any passenger for it.
- Fare exists only if there is a flight trip, i.e., if there is no flight trip, there won't be a cost for it.
- A flight trip can have multiple hops and a particular hop can be used by multiple flight trips.

Entity – Relationship (E-R) Model



TABLES AND PRIMARY KEYS

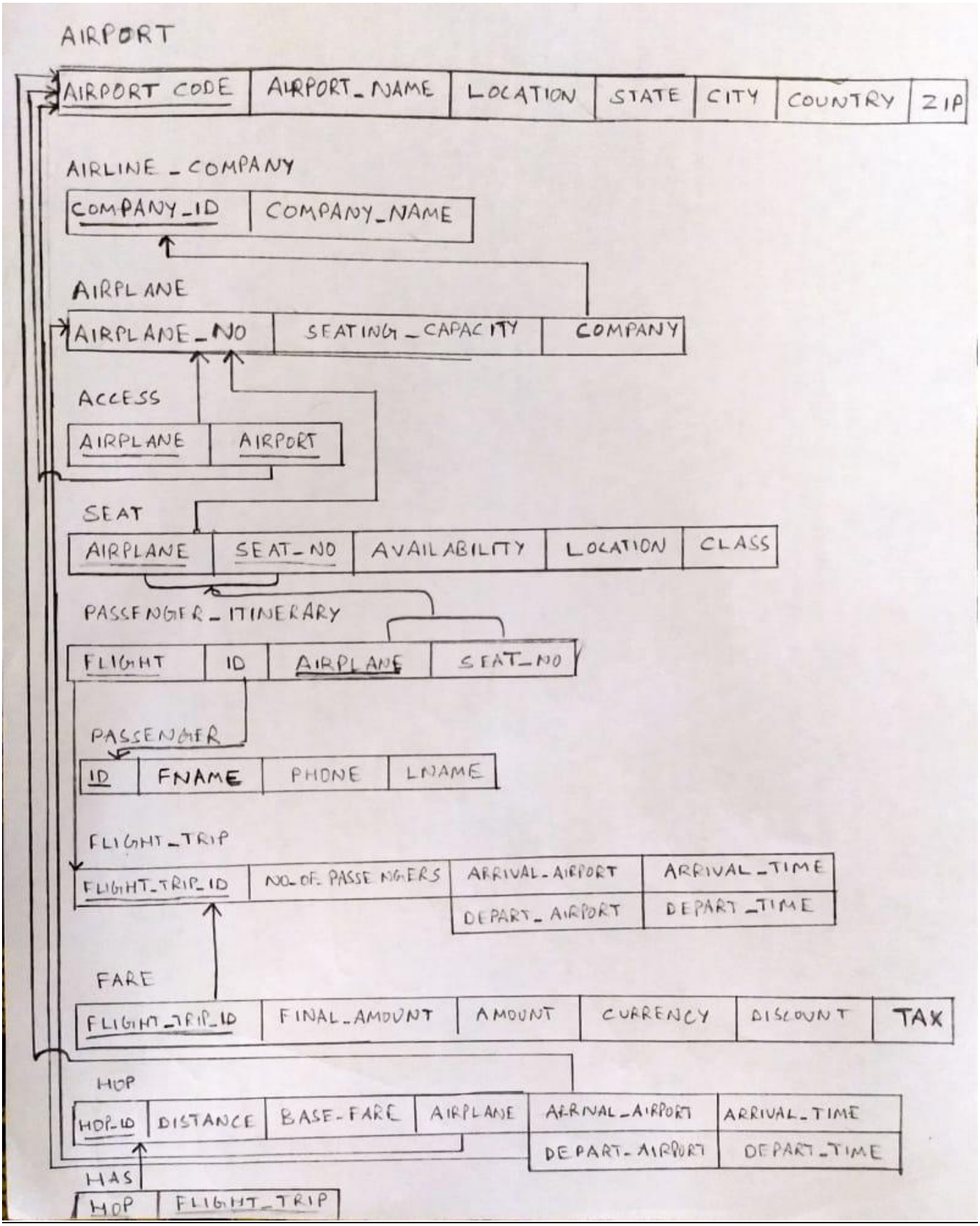
These are the final tables that we have created for the normalized relational schema. The primary key of each table is chosen carefully to ensure that any other attribute of the table is not dependent on entity other than the primary key. The table is as follows –

- AIRPORT - Airport_Code
- AIRLINE_COMPANY - Company_ID
- AIRPLANE - Flight_no
- ACCESS - Flight, Airport
- SEAT - Flight, Seat_no
- PASSENGER - ID
- PASSENGER_ITINERARY - FLIGHT, ID
- FLIGHT_TRIP - Flight_trip_id
- FARE - Flight_trip_id
- HOP - Hop_id
- HAS (HOP) - Hop, Flight_trip

Relational Schema after normalization up to BCNF

This next page shows the relational schema of the relations that are normalized up to the Boyce-Codd Normal form (BCNF). In order to remove the redundancies and all the insertion, deletion, and update anomalies, we have applied the normalization procedure in these tables by choosing the primary key of each table carefully to ensure that any other attribute of the table is not dependent on any entity other than the primary key. Because as we know that in Boyce-Codd Normal Form (BCNF), every attribute should only be determined by the Superkey/Primary key and hence now we have Relational schema in BCNF.

Relational Schema



CONCLUSION

The Airline reservation system has been a way of minimizing the clerical work, which is almost a routine and consumes the most precious time. This **AIRLINE RESERVATION SYSTEM** has been an attempt to help the passenger to minimize his workload along with minimizing the paper works and saving of time and help him to plan the safe journey by going cashless. Almost all the difficulties of manual reservation have been removed by this system.

BIBLIOGRAPHY

This refers to the sources which were gone through for the completion of this project on Airline Reservation System.

1. Book - Fundamentals of Database Systems by Ramez Elmasri and Shamkant B. Navathe
2. Class lectures and lecture notes
3. Internet websites for DBMS and procedure of the airline reservation system.

THANK YOU