Stage 2 - Conceptual and Logical Database Design

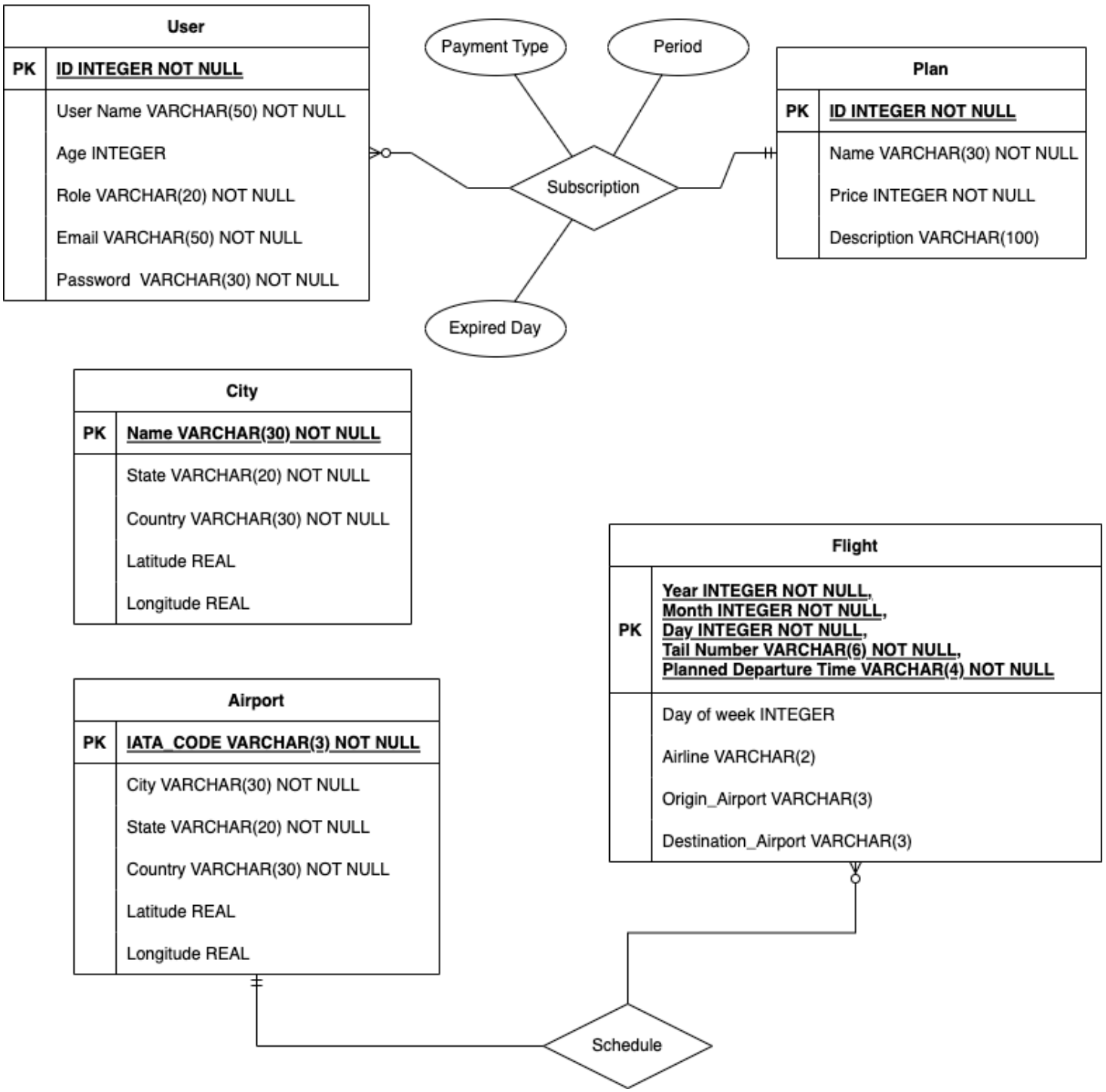
Datasets

- https://www.kaggle.com/datasets/usdot/flight-delays
- https://www.kaggle.com/datasets/juanmah/world-cities

ER Diagram

Assumption:

- There are 3 roles for the Role attribute in User table: Admin, Customer, and Employee
  - Admin refers to the database admin who can update the database through DML
  - Employees can further add new information to the system
  - Customers are people who can user the webpage to look up for the flight information
- Cities might not have any airports yet
- Customers who have not subscribed to a premium plan will default subscribe to the free plan
- For the *day of week* attribute in the dataset, 1 refers to Monday and 7 refers to Sunday



Relation Schema and Descriptions

Entities

User(ID:INT [PK], UserName:VARCHAR(50), Age:INT, Role:VARCHAR(20), Email:VARCHAR(50), Password:VARCHAR(30))

Plan(ID INT [PK], Name VARCHAR(30), Price INT, Description VARCHAR(100));

City(Name VARCHAR(30)[PK], Country VARCHAR(30), Latitude Decimal, Longitude Decimal);

Airport(IATA_CODE:VARCHAR(3)[PK], City: VARCHAR(30)[FK], State: VARCHAR(30), Latitude: Decimal, Longitude:Decimal)

Flight(Year: INT[PK], Month: INT[PK], Day: INT[PK], Tail Number: VARCHAR(6)[PK], Planned Departure Time: VARCHAR(4)[PK], Day of week: INT, Airline:VARCHAR(3), Origin_Airport: VARCHAR(3)[FK to Airport.IATA_CODE], Destination_Airport: VARCHAR(3)[FK to Airport.IATA_CODE])

Relationships

Subscription(UserID: INT [PK, FK to User.ID], PlanID: INT[FK to Plan.ID], Payment_Type: VARCHAR(20), Period: VARCHAR(20), Expired_Day: VARCHAR(20))

Subscription connects User and Plan tables, each user should have a distinct plan. It's a many-to-1 relationship between users and plans.

Schedule(Year: INT[PK, FK to Flight.Year], Month: INT [PK, FK to Flight.Month], Day: INT [PK, FK to Flight.Day], Tail_Number: VARCHAR(6) [PK, FK to Flight.Tail_Number], Planned_Departure_Time: VARCHAR(4) [PK, FK to Flight.Planned_Departure_Time], IATA_CODE: VARCHAR(3)[FK to Airport.IATA_CODE])

Schedule connects Airport and Flight tables to keep track of the various flights that take off at a certain airport. It's a many-to-many relationship.