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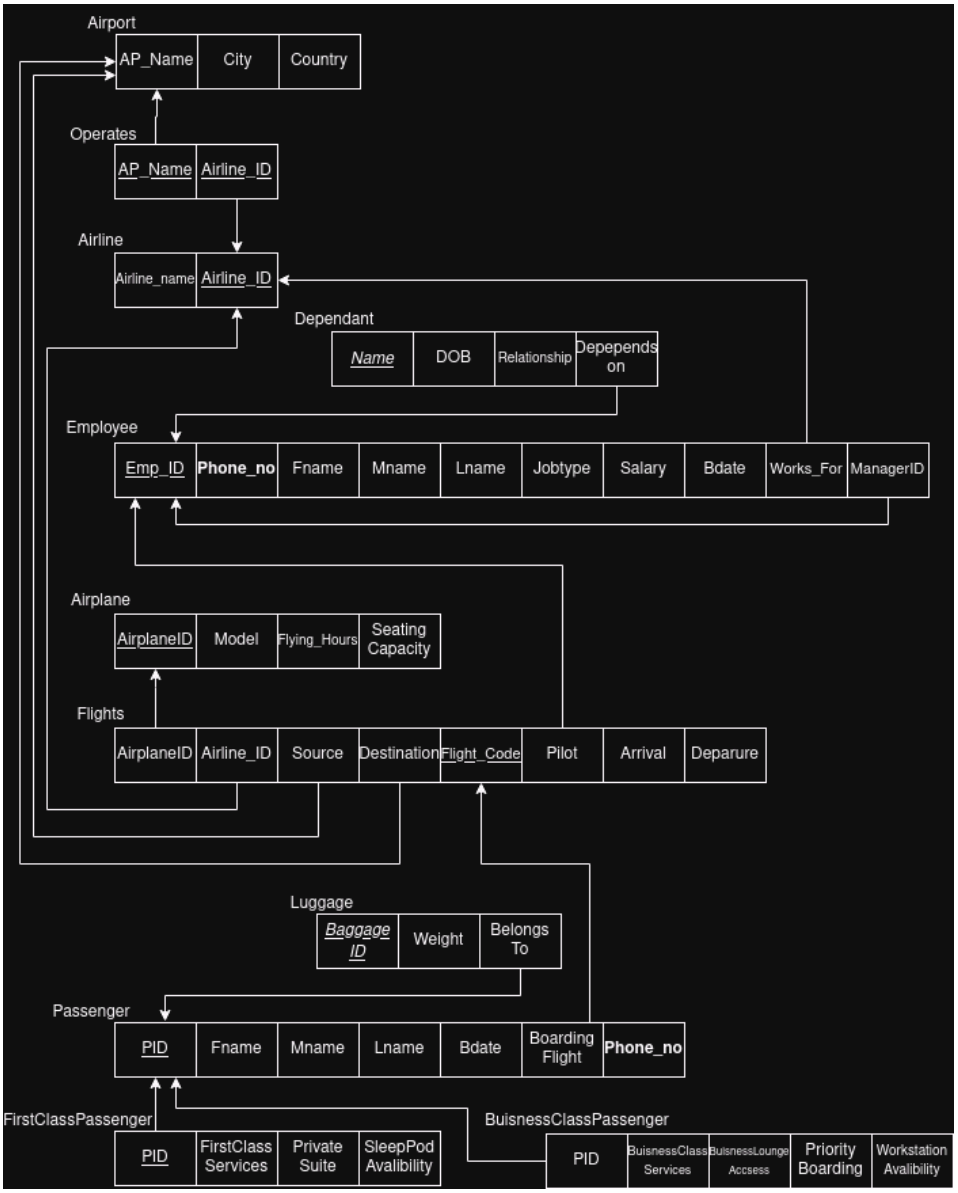
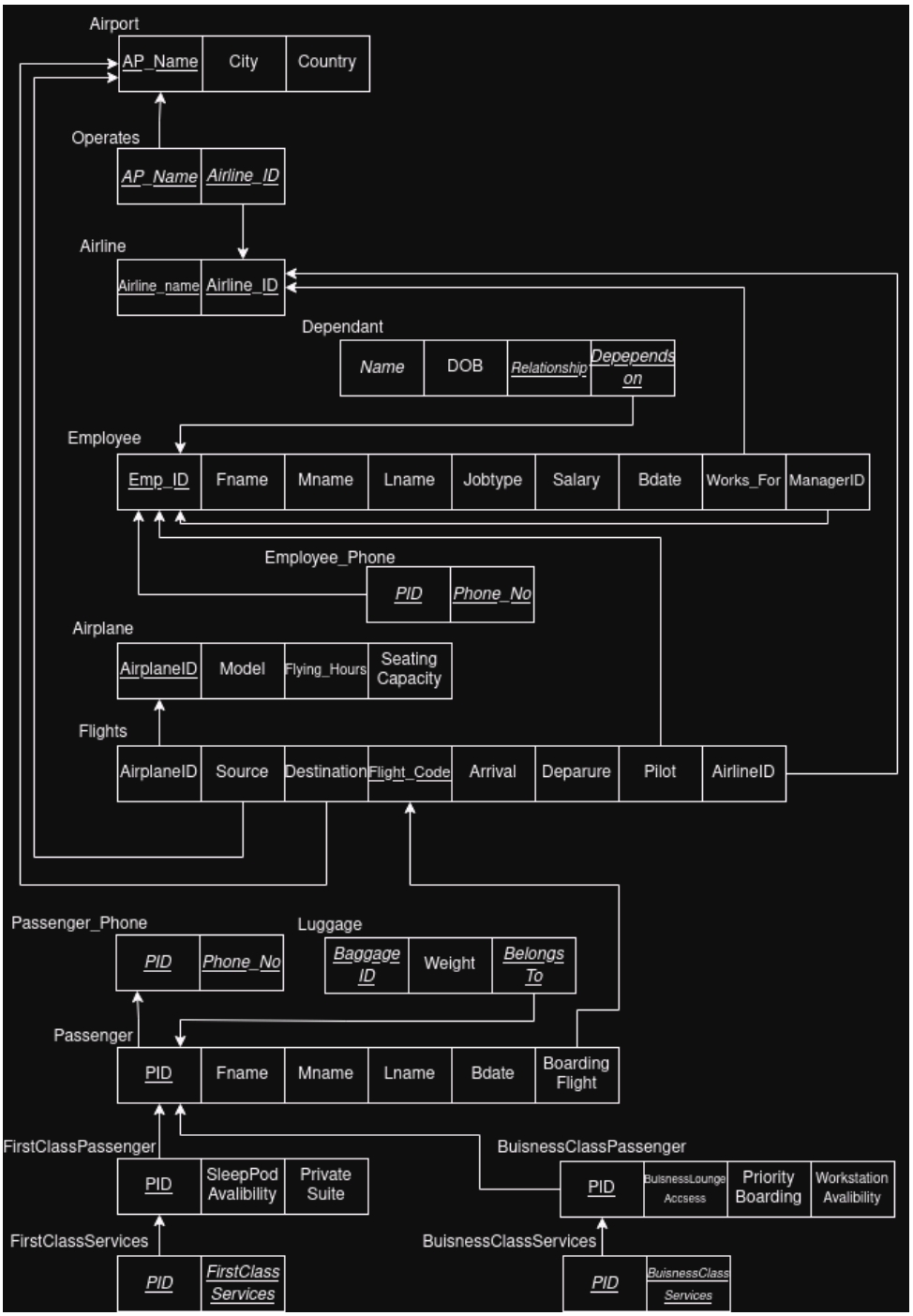
0.Relational Model

The **Relational Model** is a framework for organizing, managing, and manipulating data in a database using a tabular structure. Date is represented in tables (a.k.a relations) with Foreign keys establishing relationships between tables.



1.1st Normal Form

A database in 1NF has only atomic values. Consequently, no multivalued attributes are allowed. To convert our database into 1NF, we make employee and passenger phone numbers into a separate table that is related to employee and passenger respectively



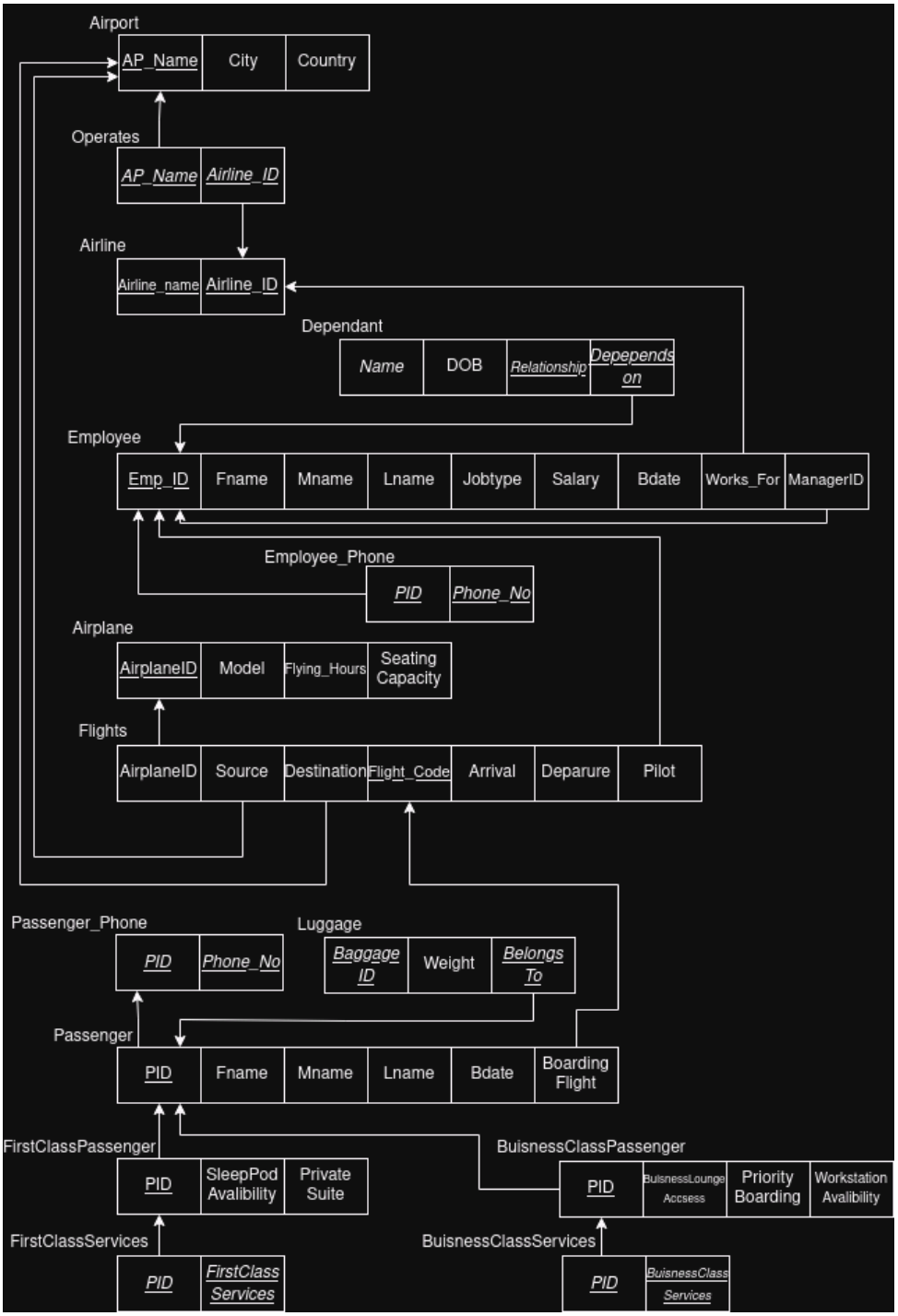
2.2nd Normal Form

This DB is already in 2NF as it has no partial functional dependencies (ie. attributes that depend not on the entire primary key but rather a subset of it.)

The only table with a primary key of size >1 is `Airline` but it does not have any other attributes so trivially there are no partial dependencies.

3.3rd Normal Form

According to 3NF, there has to be no transitive dependencies. In `Flights` table, Flight->Pilot and Pilot->AirlineID. Since the AirlineID resides in Employee table, we can simply remove AirlineID from `Flights` table without any loss of information.



Notes on Notation

Bold denotes a multivalue attribute

Underlined denotes it is a primary key

Underlined+italic denotes a participation in a primary key.All such keys make a primary key.