Project Phase -3

Team No. 15

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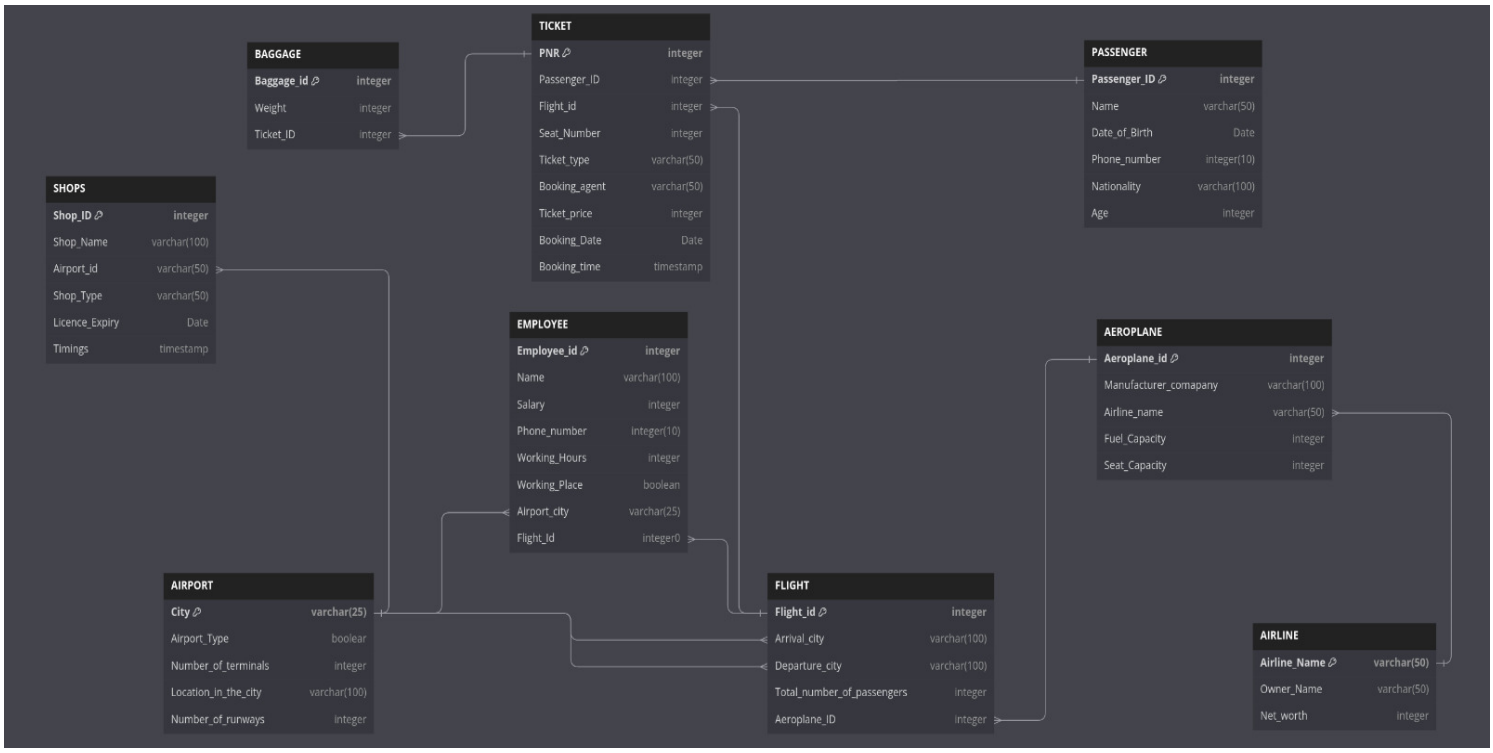
ER to Relational Model



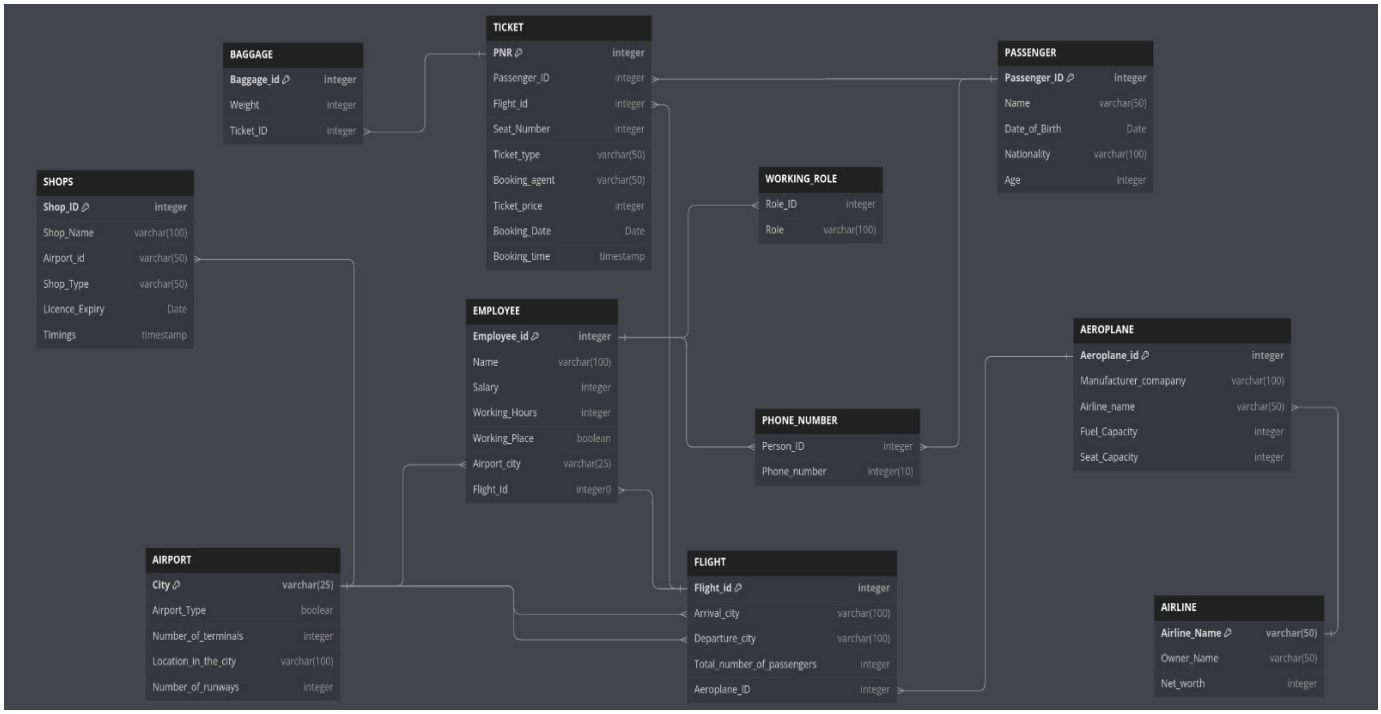
Link to tool with model for easier viewing:
https://dbdiagram.io/d/6555dfb03be14957871c9044

We have converted our database from ER model into Relational model by converting the entities as table(relation) and attributes as table columns and in the above diagram we have displayed the schema of each table(relation) showing relation name and data types with constraints of each attribute and also the referencing of attributes.

We have not created the relational schema of each relationship type because all our relationships 1:N and N:1 (one to many) so we can combine the table of that relationship with a table of entity type whose instances are participating N times in one relationship instance and so to finally make 2 tables in order to do minimization.

Now below we will be doing Normalization on our Database Schema:-
The main aim of normalization below is to reduce or remove the redundancy in our relational model in order to avoid anomalies.

❖ Relational Model to 1NF



Here in order to convert it to 1NF normal form, we converted all the multivalued attributes into their own tables and made the combination of the primary key of the original table and the multivalued attribute in one table in which the primary key of original table will be foreign key in new table referencing to primary key in original table.

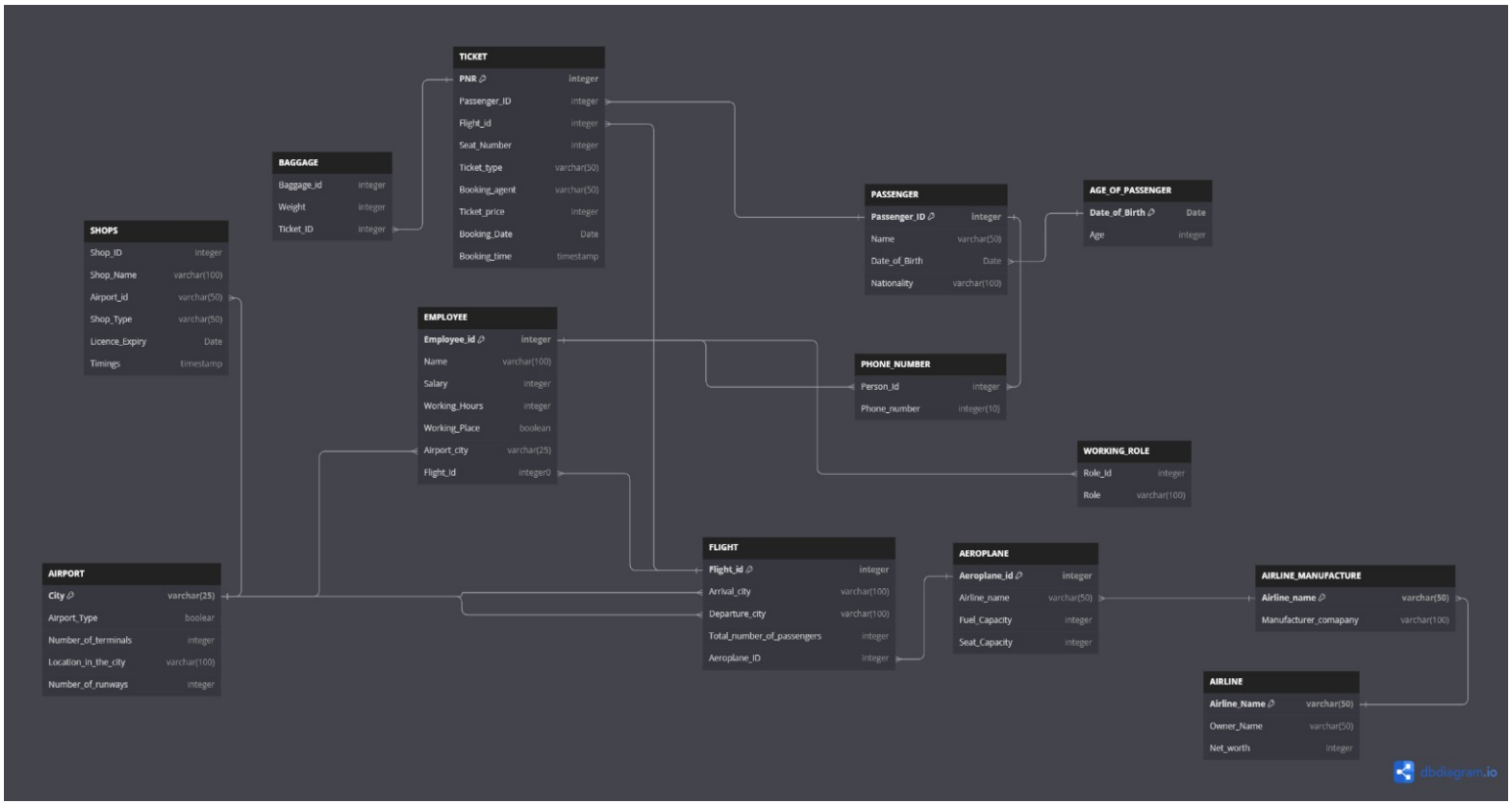
Like in order to handle the multivalued attribute “Working_role” and “phone number” we removed these attributes from employee and passenger and made a separate tables for them. Then we have inserted a foreign key in both of the tables and mapped them to their respective primary key.

❖ 1NF to 2NF relational model

Our all tables were in 1NF form now and also we do not find any non-prime attribute in any of the tables which depends only on some part(few attributes) of candidate key thus having partial dependency with the

candidate key in one table. So now our model is also in 2NF relational model form.

❖ 2NF to 3NF relational model



For converting 2NF to 3NF normal form, we firstly had to find out all the transitive relationships from our database. We got two transitive relationship in which there is a functional dependency between two non-prime attributes :-

1. Age and DOB(date of birth) in “PASSENGER” relation
2. Airline_name and manufacturer_company in “AEROPLANE” relation

For each of them ,we have created tables in which in the first case we put DOB and Age in one table and make DOB be a primary key which is

referenced from DOB in the original table being foreign key now and remove Age from the original table.
In the second case we put Airline_name and manufacturer_company in one table and made Airline_name as primary key being referenced from the same attribute in the original table being foreign key now and also removing manufacturer_company from the original table.

Thank You.