COL362 Project

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1 ER Diagram

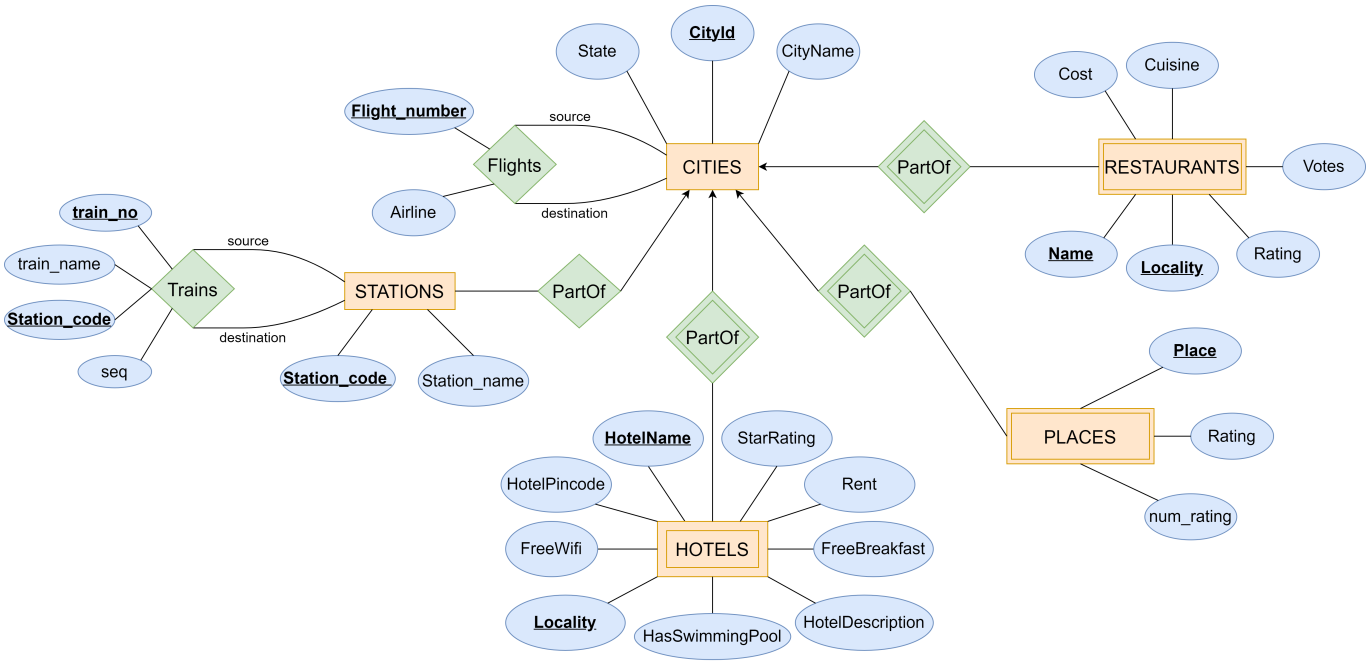

Figure 1: ER diagram

2 Transformation to Relational Schema

For each of the entities and relations in the above diagram we have the following relations :

1. Cities (**CityId**, CityName, State)
2. Hotels (**CityId**, **HotelName**, **Locality**, StarRating, Rent, FreeBreakfast, FreeWifi, HotelPincode, HasSwimmingPool, HotelDescription)
3. Places (**CityId**, **Place**, Rating, num_rating)
4. Restaurants (**CityId**, **Name**, **Locality**, Cost, Cuisine, Votes, Rating)
5. Stations (**CityId**, **Station_code**, Station_name)
6. Flights (**CityId**, **Flight_number**, Airline)
7. Trains (**Station_code**, **train_no**, Source_Station_code, Destination_Station_code,train_name, seq)

3 Functional Dependencies

For each relation we have the following FDs:

- CityId → CityName, State

- CityId, HotelName, Locality → StarRating, Rent, FreeBreakfast, FreeWifi, HotelPincode, HasSwimmingPool, HotelDescription
- CityId, Place → Rating, num_rating
- CityId, Name, Locality → Cost, Cuisine, Votes, Rating
- CityId, Station_Code → Station_name
- CityId, FlightNumber → Airline
- Station_Code, train_no → Source_Station_code, Destination_Station_code,train_name, seq

These FDs are of the form X → Y where X is primary key and Y is the rest of attributes for each relation.

Apart from these, we have the following non-trivial FDs which cannot be inferred from the above FDs:

- train_no → train_name, Source_Station_code, Destination_Station_code
- CityName, State → CityId

4 FD Preserving Normalization

We observe that the relation Trains violates BCNF due to the FD:

train_no → train_name, Source_Station_code, Destination_Station_code

This is because train_no does not form a superkey for the Train relation.
To convert this into BCNF, we divide this relation into 2 separate relations:

- TrainPath (**train_no**, **Station_code**, seq)
- TrainInfo (**train_no**, train_name, Source_Station_code, Destination_Station_code)

5 Final Relational Schema

After normalization, we have the following relations:

1. Cities (**CityId**, CityName, State)
2. Hotels (**CityId**, **HotelName**, **Locality**, StarRating, Rent, FreeBreakfast, FreeWifi, HotelPincode, HasSwimmingPool, HotelDescription)
3. Places (**CityId**, **Place**, Rating, num_rating)
4. Restaurants (**CityId**, **Name**, **Locality**, Cost, Cuisine, Votes, Rating)
5. Stations (**CityId**, **Station_code**, Station_name)
6. Flights (**CityId**, **Flight_number**, Airline)
7. TrainPath (**train_no**, **Station_code**, seq)
8. TrainInfo (**train_no**, train_name, Source_Station_code, Destination_Station_code)

6 Github Repository link

Team Name: Not Random
link: `https://github.com/kankits/Not-Random`