Whispering Journeys

Tours and Travels Database

Section-B | Group T-610

IT-214 Database Management System Project

Group Details

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Objective:

Creating and structuring a database to enhance the ease and comfort of users during their journeys within our tours and travel system. This database provides details about Transportation bookings, Accommodations, Trips and major attractions around the globe. This database supports all features of a standard E-commerce website.

General Description:

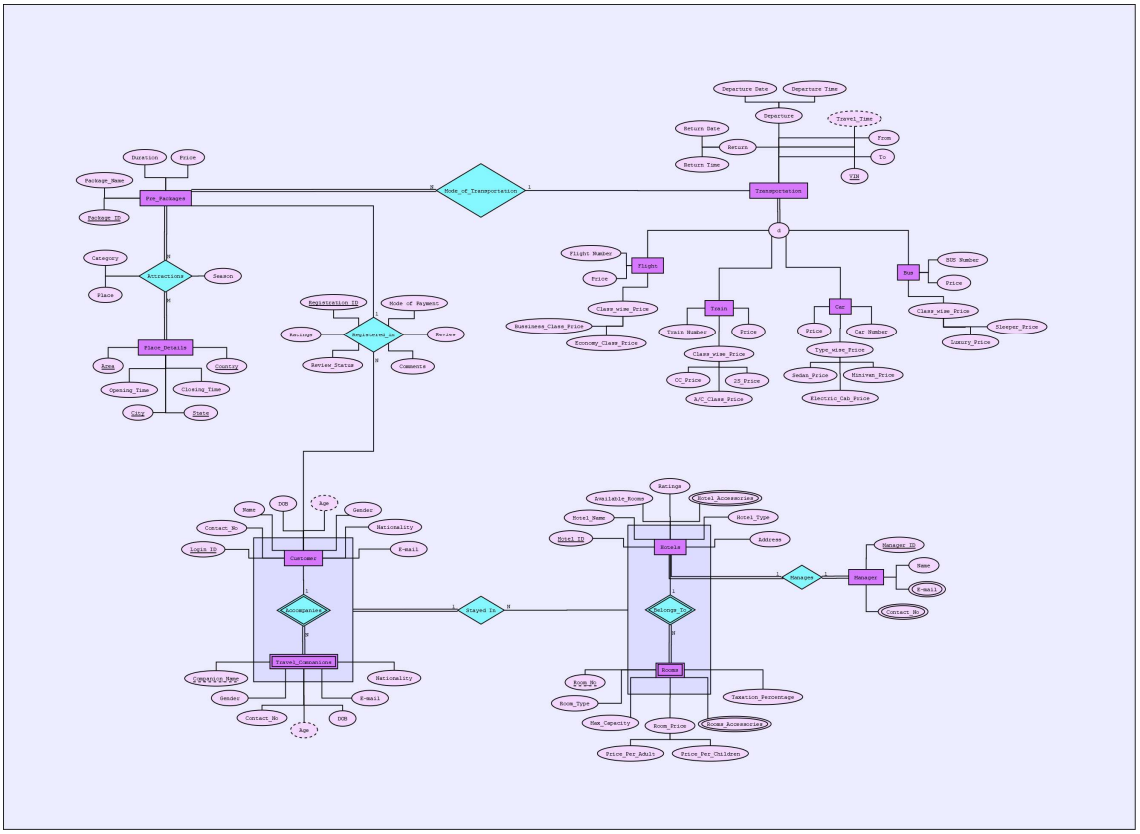
This report provides design, description and implementation of the database for handling the Tours and Travels Industry/Agency. This system will assist the users/Customers to perform effortless operations over the system and have a smooth experience in finding their destination/desired place to visit.

The System provides the desired and the closest match of the Trip Package according to the customer's Preferences. It aims to help the customer by providing all the necessary links for an effortless and loving Journey by providing the Accommodation and Transportation Facilities which are best Suited for the given trip.

The System also aims to perform complex queries/tasks provided for the convenience of the customer, which is an important part in finding a Perfect trip Destination.

The ER-Diagram

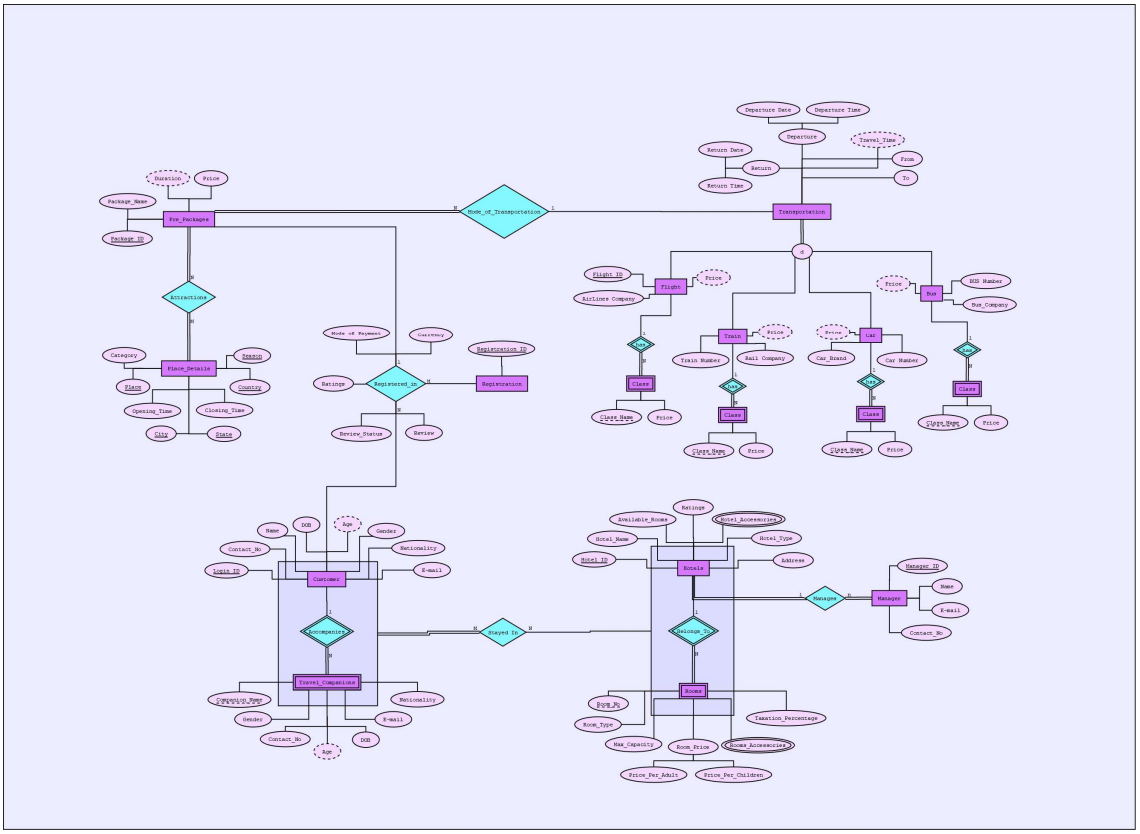
1) ER-Diagram Version 01:



Here, There are multiple errors in this ER-Diagram.

- The Registered_IN relation is mistakenly created with the primary key as Registration ID.
- The Price Details for every transportation Entity is not perfectly in sync with { Vehicle Class, Class Price } Pair.
- The Attributes of the attractions are best suited in the Place_Details entity rather than where it was placed.

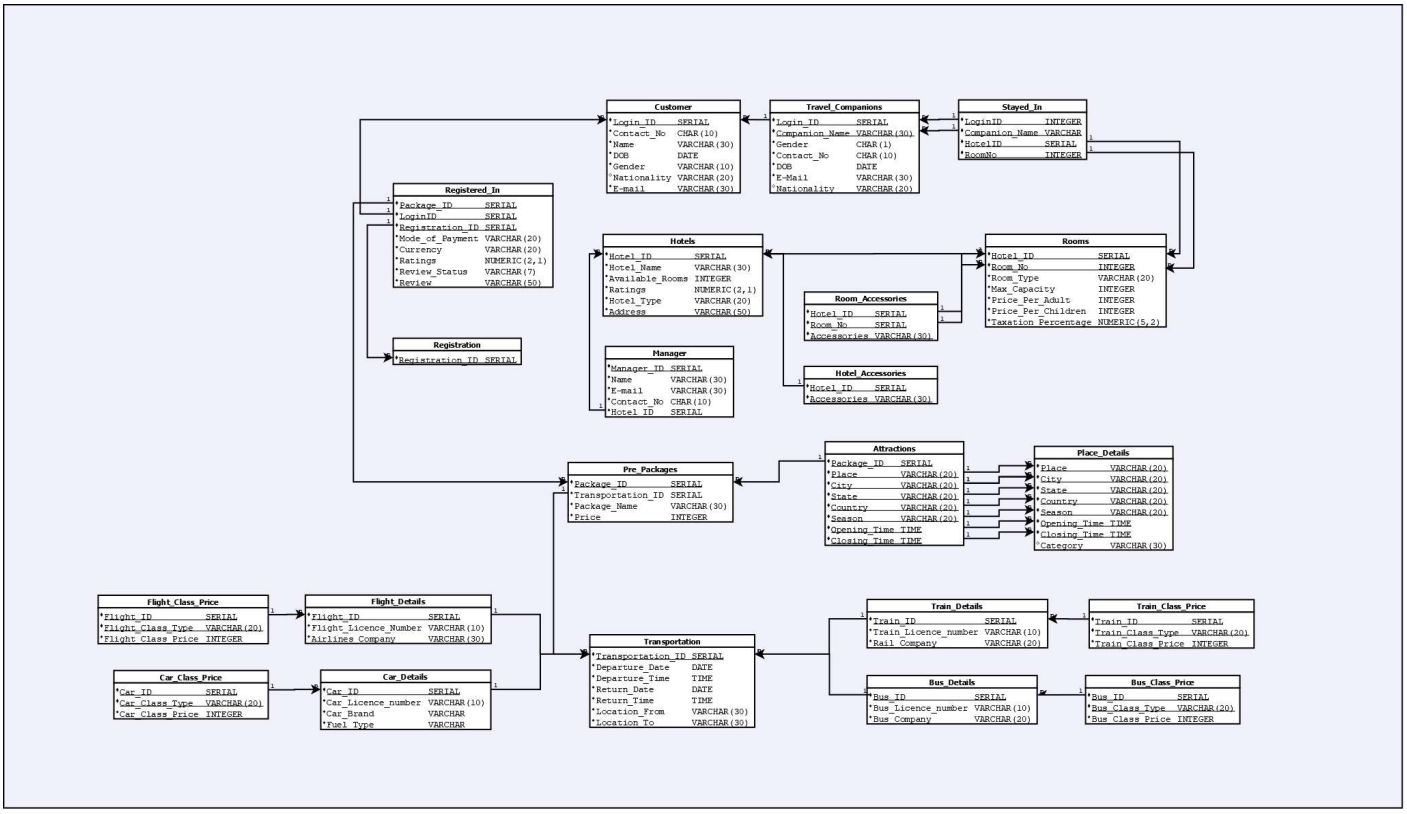
2) ER-Diagram Final Version :



Here, all of the Previous mistakes are been taken care off.

- There is a separate entity assigned for the Registrations which will take part in the Registered_IN relation.
- There has been an addition of the weak entities, for settling the issue of corresponding { class, Price } pair association along with additional vehicle details.
- The Attributes are moved to where they are best suited to.
- Changed the attributes of Manager entity namely, E-mail and Contact_No from multiple attributes to single attribute.
- Changed the cardinality of the Manages relation from 1:1 to 1:N.
- Changed the cardinality of the Stayed_IN relation from 1:N to M:N.

The Relational Mapping



The Normalization Proofs

01) Customer Relation :

Relation-1) Customer

- **Relation Schema** : Customer(Login_ID, Contact_No, Name, DOB, Gender, Nationality, E-mail)
- **Functional_Dependencies** : Login_ID → { Contact_No, Name, DOB, Gender, Nationality, E-mail }
- **Candidate Key** : Since, Login_ID Determines all other attributes of the relation, candidate key = { Login_ID }
- **Prime attributes** : Login_ID
- **Assumption** : → Here, We assumed that there may be two Registrations of the customer with either same Contact_No or E-mail
  → Like, Consider a case, where we have a couple which is registered in the Site individually. Now, It might be the case where the wife had created her account by the giving the Contact_No or E-mail of her Husband as credentials.
  → So, Considering such scenario, Here Contact_No and E-mail are not Primary Key and doesn't have the functional dependencies.
- **1NF Status** : → Since the table doesn't contain any Multivalued or Composite attribute, This relation is in 1NF Form.
- **2NF Status** : → Here, There are no Partial Dependencies in the relation. This relation is in 2NF Form.
- **3NF Status** : → Here, There are no Transitive Dependencies in the relation. This relation is in 3NF Form.
- **BCNF Status** : → Since, all the Functional Dependencies are determined by the SuperKey, This relation is in BCNF Form.

- This Relation Stores the Details of all the Customers which are associated with the system.
- Every Customer will be assigned a Unique Login_ID which will be a necessary aspect in Login Credentials to operate onto the features of the system.

02) Travel_Companions Relation :

Relation-2) Travel_Companions

- **Relation Schema** : Travel_Companions(Login_ID, Companion_Name, Contact_No, DOB, Gender, Nationality, E-mail)
- **Functional_Dependencies** : { Login_ID, Companion_Name } → { Contact_No, DOB, Gender, Nationality, E-mail }
- **Candidate Key** : Since, { Login_ID, Companion_Name } Determines all other attributes of the relation, candidate key = { { Login_ID, Companion_Name } }
- **Prime attributes** : Login_ID, Companion_Name
- **Assumption** : → Here, We assumed that, the names (Full Names) of the Companions of the Customer will have different name (atleast Full Names will be different)
- **1NF Status** : → Since the table doesn't contain any Multivalued or Composite attribute, This relation is in 1NF Form.
- **2NF Status** : → Here, There are no Partial Dependencies in the relation. This relation is in 2NF Form.
- **3NF Status** : → Here, There are no Transitive Dependencies in the relation. This relation is in 3NF Form.
- **BCNF Status** : → Since, all the Functional Dependencies are determined by the SuperKey, This relation is in BCNF Form.

- This relation stores the Details of the Companions which are accompanied by the Customer who registered for the trip Package.
- Here, they need not have the Login_ID Credentials to get registered onto the trip.

03) Hotels Relation :

```
Relation-3) Hotels

  Relation Schema          : Hotels(Hotel_ID, Hotel_Name, Available_rooms, Ratings, Hotel_Type, Address)

  Functional_Dependencies  : { Hotel_ID } → { Hotel_Name, Available_rooms, Ratings, Hotel_Type, Address }

  Candidate Key            : Since, Hotel_ID Determines all other attributes of the relation,
                             candidate key = { Hotel_ID }

  Prime attributes         : Hotel_ID

  Assumption               : → Here, There aren't any specific assumptions for this relation.

  1NF Status               : → Since the table doesn't contain any Multivalued or Composite attribute,
                               This relation is in 1NF Form.

  2NF Status               : → Here, There are no Partial Dependencies in the relation.
                               This relation is in 2NF Form.

  3NF Status               : → Here, There are no Transitive Dependencies in the relation.
                               This relation is in 3NF Form.

  BCNF Status              : → Since, all the Functional Dependencies are determined by the SuperKey,
                               This relation is in BCNF Form.
```

- This relation holds the details of all the hotels that are registered with this Tourism System.
- This will serve as a source for determining the hotels nearby the Customer's Destination Place.

04) Rooms Relation :

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Relation-4) Rooms

  Relation Schema          : Rooms(Hotel_ID, Room_No, Room_Type, Max_Capacity, Price_Per_Adult, Price_Per_Children, Taxation_Percentage)

  Functional_Dependencies  : { Hotel_ID, Room_No } → { Room_Type, Max_Capacity, Price_Per_Adult, Price_Per_Children, Taxation_Percentage }

  Candidate Key            : Since, { Hotel_ID, Room_No } Determines all other attributes of the relation,
                             candidate key = { { Hotel_ID, Room_No } }

  Prime attributes         : Hotel_ID, Room_No

  Assumption               : → Here, We assumed that, the Room_No of a Particular Hotel will be unique.

  1NF Status               : → Since the table doesn't contain any Multivalued or Composite attribute,
                               This relation is in 1NF Form.

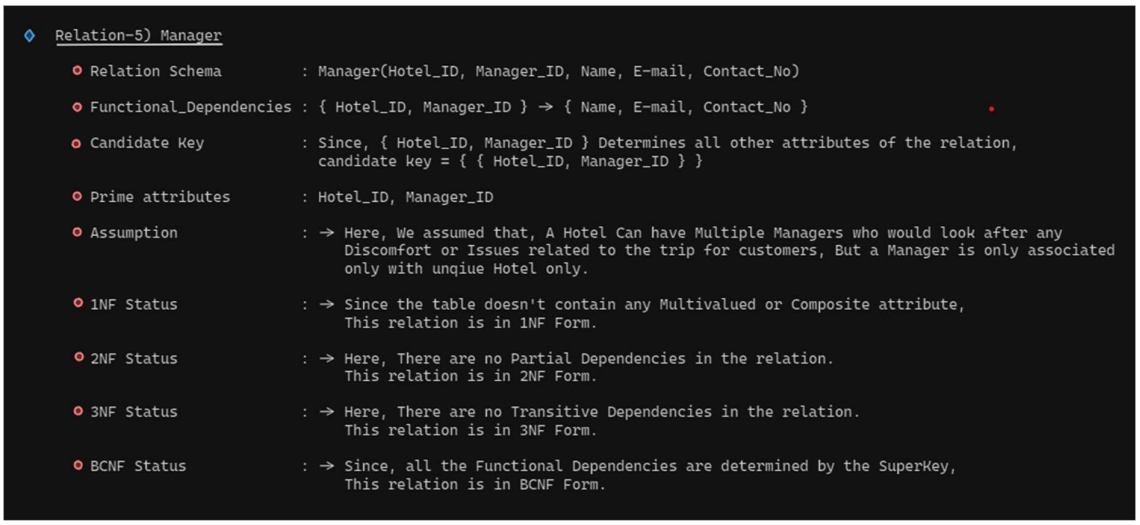
  2NF Status               : → Here, There are no Partial Dependencies in the relation.
                               This relation is in 2NF Form.

  3NF Status               : → Here, There are no Transitive Dependencies in the relation.
                               This relation is in 3NF Form.

  BCNF Status              : → Since, all the Functional Dependencies are determined by the SuperKey,
                               This relation is in BCNF Form.
```

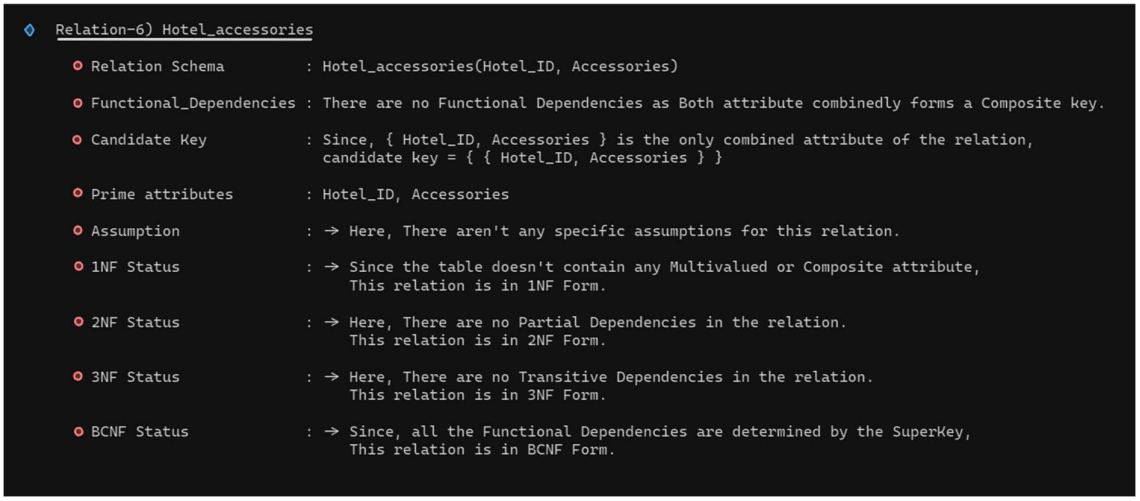
- This relation holds the details of all the rooms along with its types, prices and capacity constraints.
- This will help the Customer to Prefer the rooms according to the family/Companions size or to facilitate themselves with the comfort they want.

05) Manager Relation :



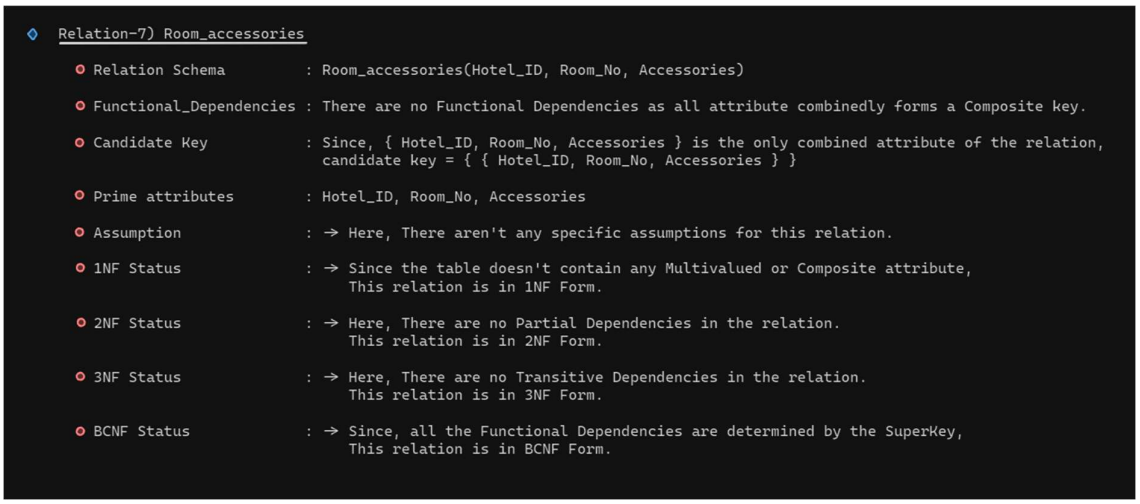
- This relation holds the details of the managers, which are associated with the hotels along with their credentials.
- This relation is useful for the Convenience of the Customers, as managers would act as the point of contact for any discomforts or any needs at that place.

06) Hotel_accessories Relation :



- This Relation holds the information about the accessories which are available in the given hotel.
- This is also for the filtering of the hotels by the customers, to choose the best comfort or add Ons for their stays.

07) Room_accessories Relation :

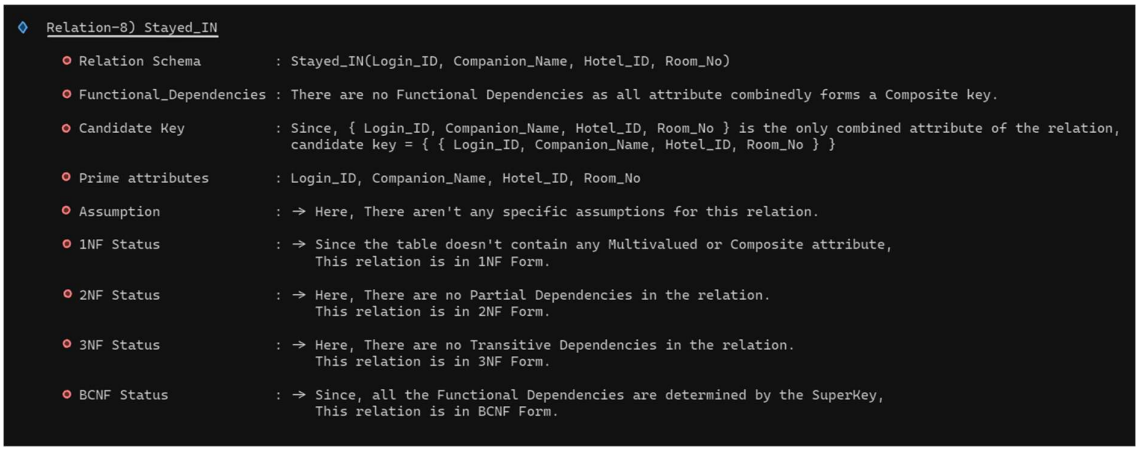


Relation-7) Room_accessories

- Relation Schema : Room_accessories(Hotel_ID, Room_No, Accessories)
- Functional_Dependencies : There are no Functional Dependencies as all attribute combinedly forms a Composite key.
- Candidate Key : Since, { Hotel_ID, Room_No, Accessories } is the only combined attribute of the relation, candidate key = { { Hotel_ID, Room_No, Accessories } }
- Prime attributes : Hotel_ID, Room_No, Accessories
- Assumption : → Here, There aren't any specific assumptions for this relation.
- 1NF Status : → Since the table doesn't contain any Multivalued or Composite attribute, This relation is in 1NF Form.
- 2NF Status : → Here, There are no Partial Dependencies in the relation. This relation is in 2NF Form.
- 3NF Status : → Here, There are no Transitive Dependencies in the relation. This relation is in 3NF Form.
- BCNF Status : → Since, all the Functional Dependencies are determined by the SuperKey, This relation is in BCNF Form.

- This Relation holds the information about the accessories which are available in the particular room of the given hotel.
- This is also for the filtering of the rooms accessories by the customers, to choose the best comfort or add Ons for their stays.

08) Stayed_IN Relation :

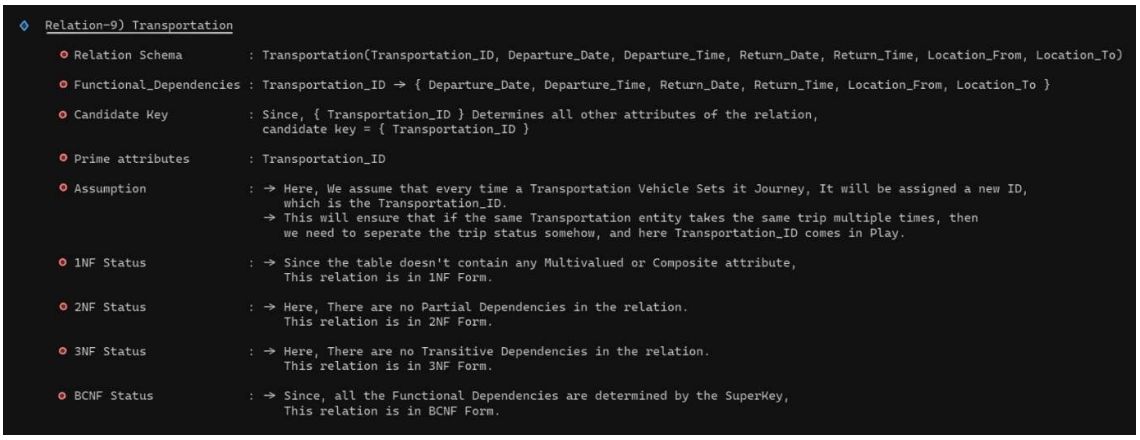


Relation-8) Stayed_IN

- Relation Schema : Stayed_IN(Login_ID, Companion_Name, Hotel_ID, Room_No)
- Functional_Dependencies : There are no Functional Dependencies as all attribute combinedly forms a Composite key.
- Candidate Key : Since, { Login_ID, Companion_Name, Hotel_ID, Room_No } is the only combined attribute of the relation, candidate key = { { Login_ID, Companion_Name, Hotel_ID, Room_No } }
- Prime attributes : Login_ID, Companion_Name, Hotel_ID, Room_No
- Assumption : → Here, There aren't any specific assumptions for this relation.
- 1NF Status : → Since the table doesn't contain any Multivalued or Composite attribute, This relation is in 1NF Form.
- 2NF Status : → Here, There are no Partial Dependencies in the relation. This relation is in 2NF Form.
- 3NF Status : → Here, There are no Transitive Dependencies in the relation. This relation is in 3NF Form.
- BCNF Status : → Since, all the Functional Dependencies are determined by the SuperKey, This relation is in BCNF Form.

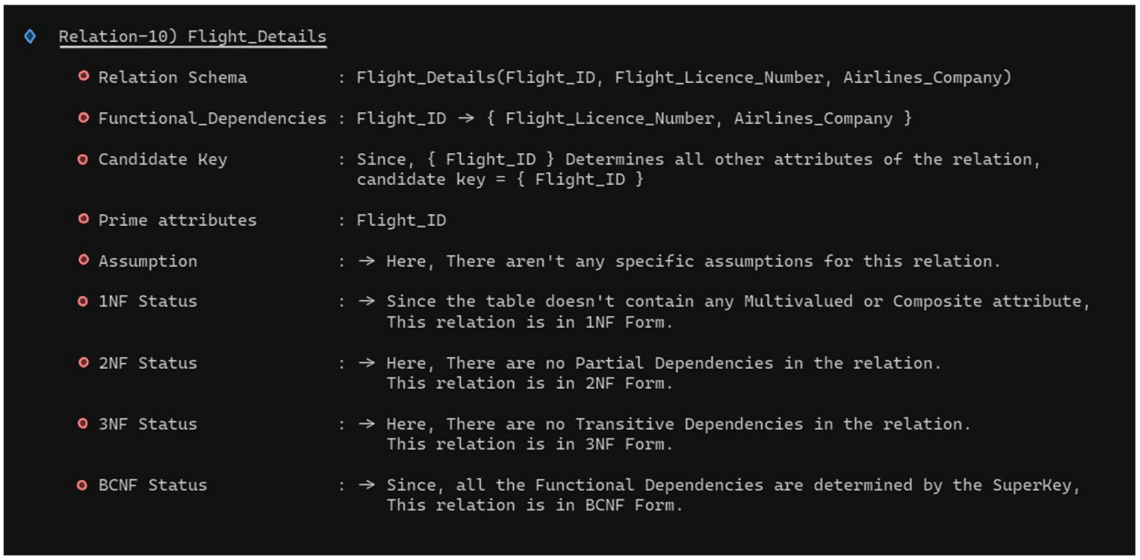
- This relation holds the details of the Customers and their stays in the hotel.
- This will store the information about which customer stayed in which hotel's room.

09) Transportation Relation :



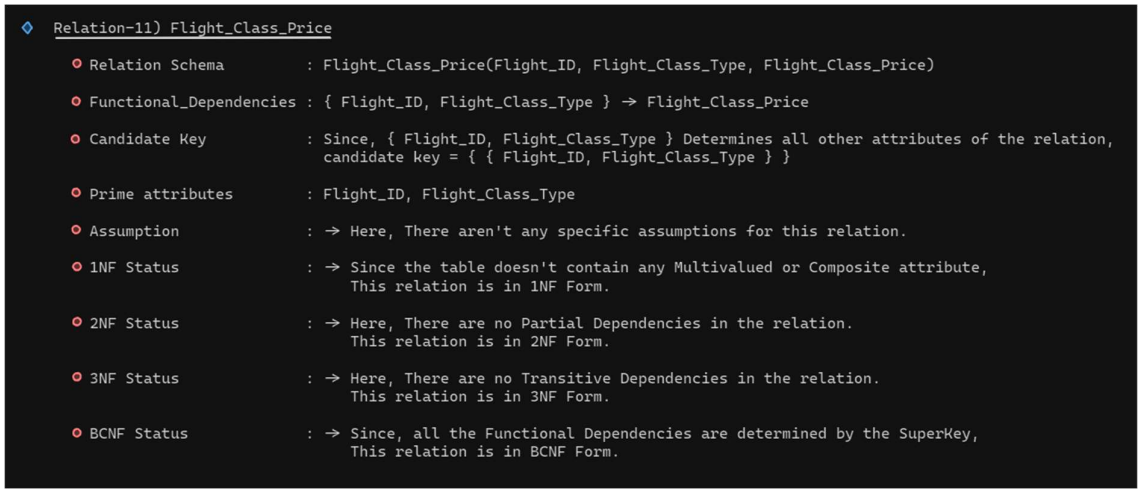
- This Relation hold the details of the Transportation entities and their Departure Date, time and return Date, time along with the Place details of the Tour.
- This is just for the sake of the Customer, to easily find the vehicles for this current to Destination place.

10) Flight_Details Relation :



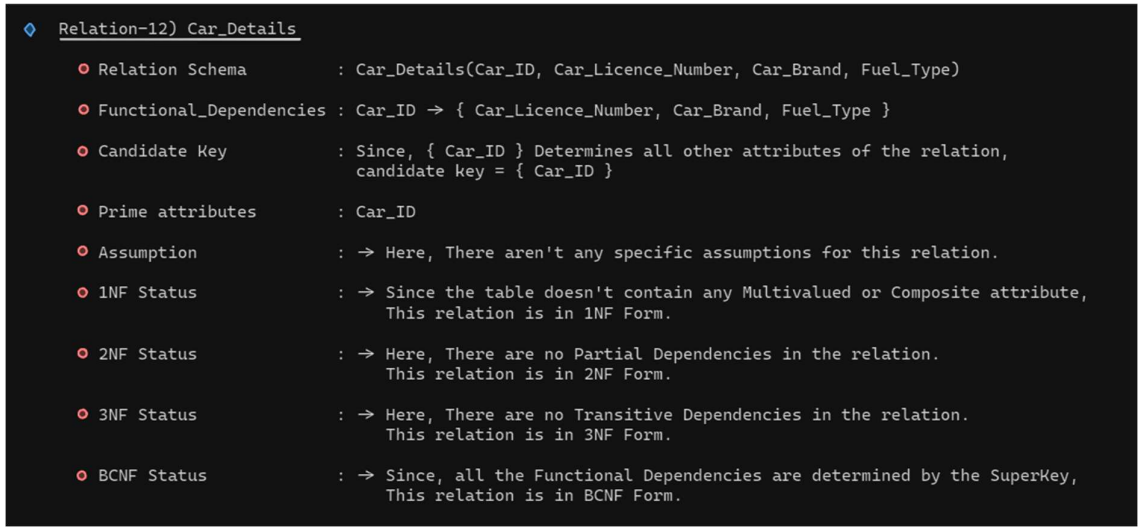
- This relation holds the details of the Flights which are registered in the transportation section of this system.
- Here, the extra details for the flights are also provided for the filtering options for the customers.

11) Flight_Class_Price Relation :



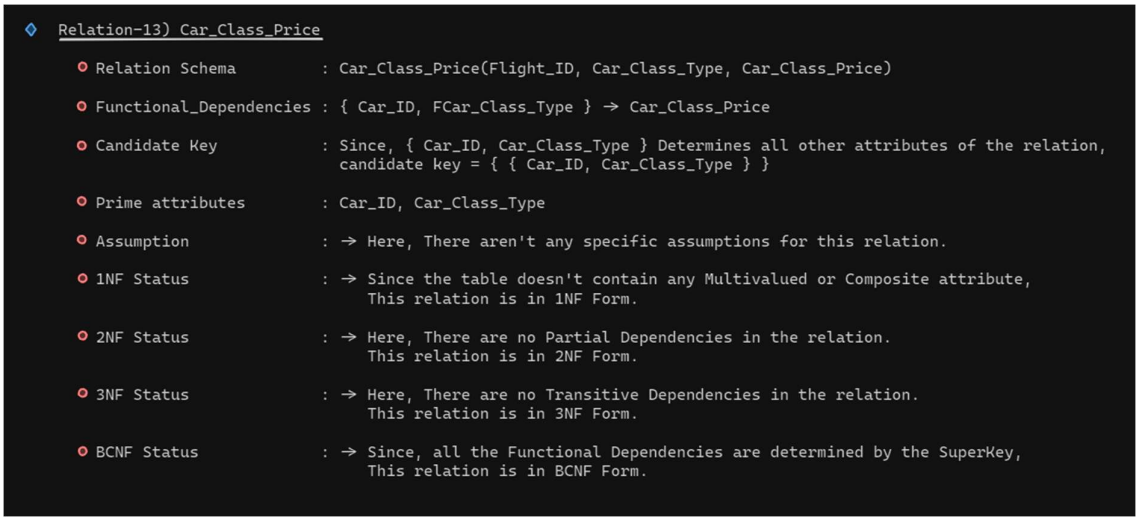
- This relation holds the details of the Flight's available class and its corresponding prices.
- This will help the system to efficiently give out the results of the preferences asked by customer.

12) Car_Details Relation :



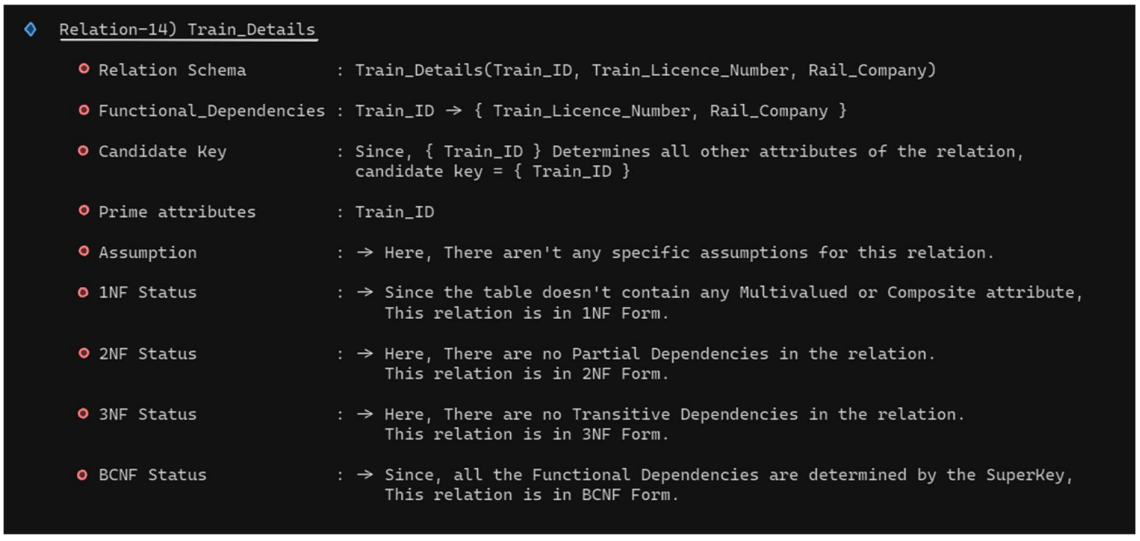
- This relation holds the details of the cars which are registered in the transportation section of this system.
- Here, the extra details for the Cars are also provided for the filtering options for the customers.

13) Car_Class_Price Relation :



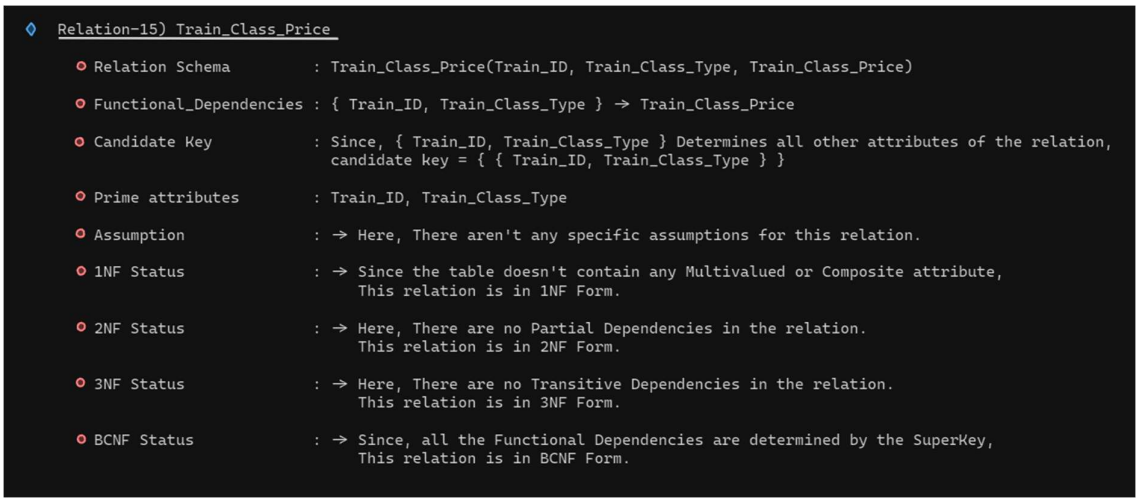
- This relation holds the details of the Car's available class and its corresponding prices.
- This will help the system to efficiently give out the results of the preferences asked by customer.

14) Train_Details Relation :



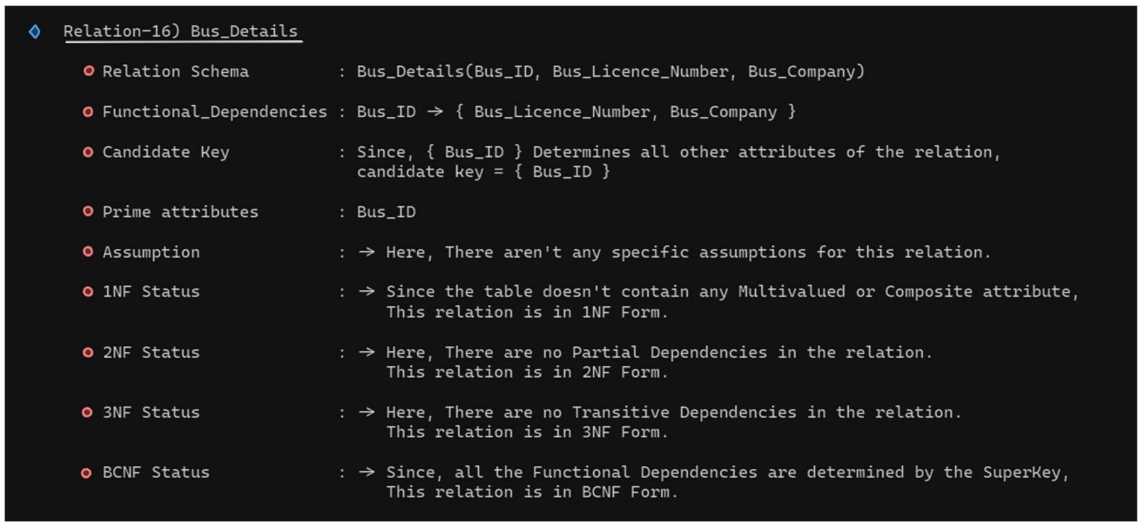
- This relation holds the details of the Trains which are registered in the transportation section of this system.
- Here, the extra details for the Trains are also provided for the filtering options for the customers.

15) Train_Class_Price Relation :



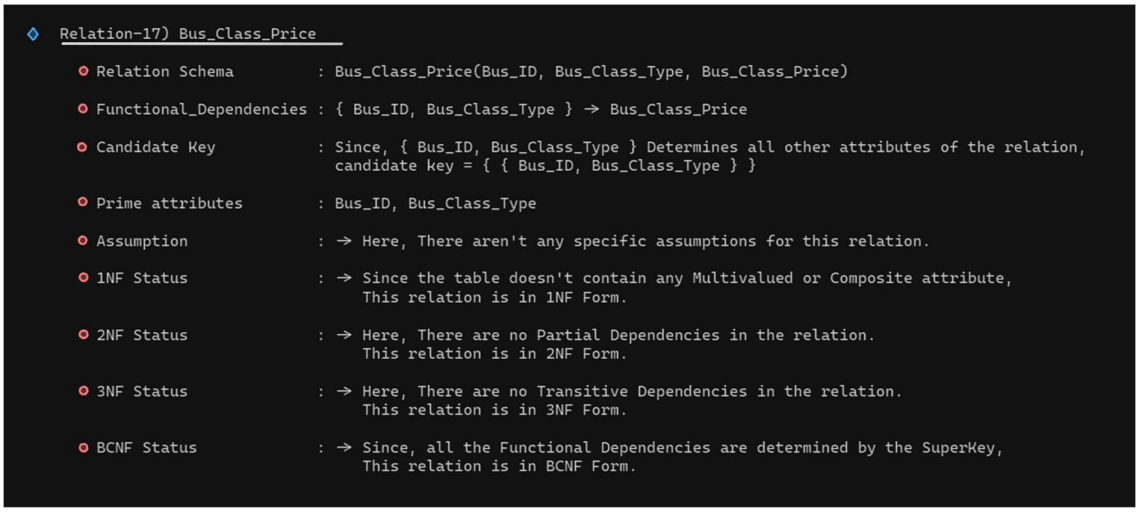
- This relation holds the details of the Train's available class and its corresponding prices.
- This will help the system to efficiently give out the results of the preferences asked by customer.

16) Bus_Details Relation :



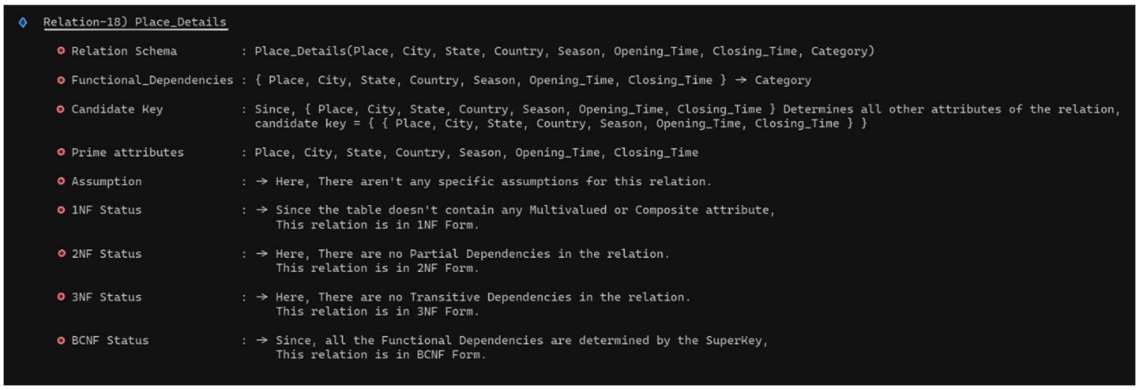
- This relation holds the details of the Buses which are registered in the transportation section of this system.
- Here, the extra details for the Buses are also provided for the filtering options for the customers.

17) Bus_Class_Price Relation :



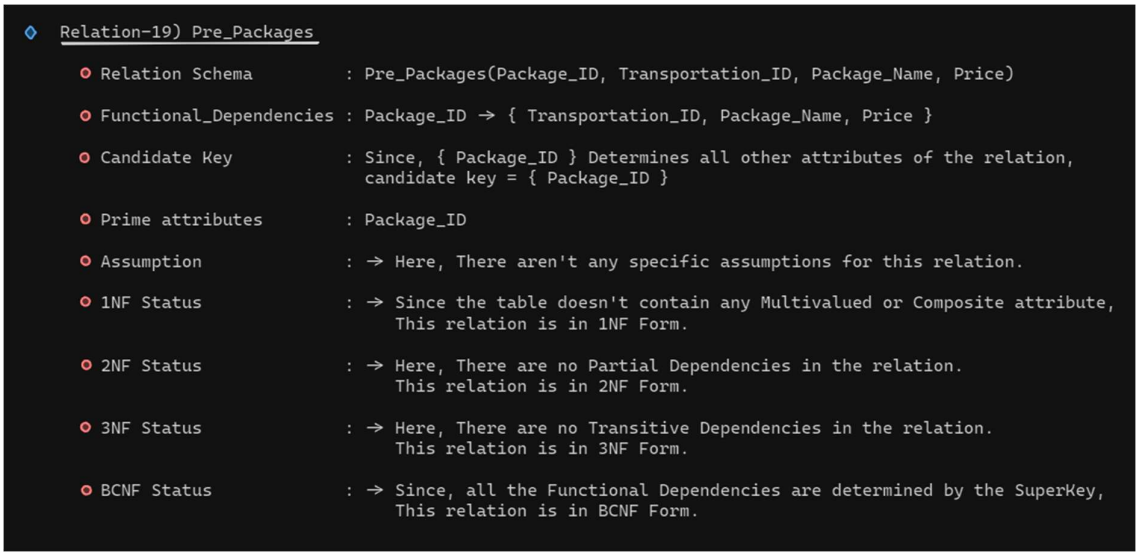
- This relation holds the details of the Bus's available class and its corresponding prices.
- This will help the system to efficiently give out the results of the preferences asked by customer.

18) Place_Details Relation :



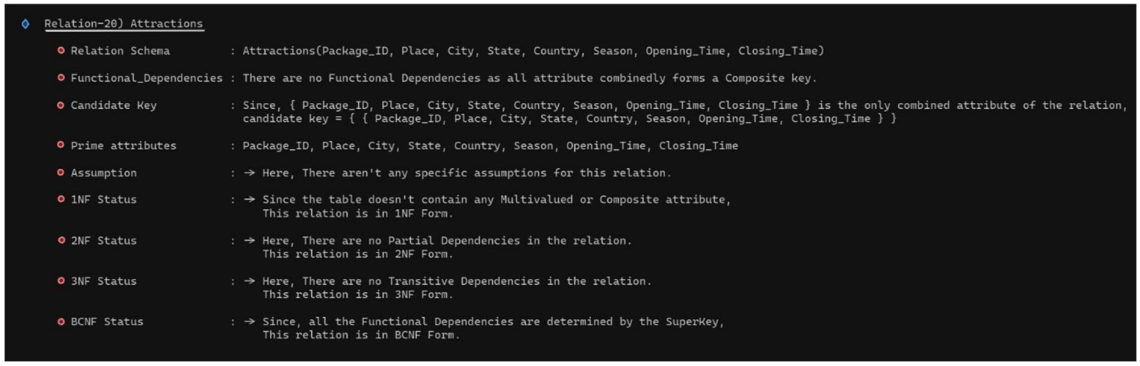
- This relation holds the details of the Places of the world which are the famous tourists attractions.
- It Contains all the possible places which are centre for attractions and this will serve as a source for Defining the Trip Package by choosing the Place for this relation.

19) Pre_Packages Relation :



- This relation holds the details of the Pre-Defined packages where the reach of the Tourism Agency stretches.
- Hence, it will act as a source for the Defining the Trip Packages offered by the Agency.

20) Attractions Relation :



- This relation holds the details of the actual trip package details along with its place assignment and filtering options.
- This will provide the customer, their desired trip destination.

21) Registrations Relation :

```
Relation-21) Registration

  Relation Schema         : Registration(Registration_ID)

  Functional_Dependencies : There are no Functional Dependencies as the relation has only one attribute.

  Candidate Key           : Since, { Registration_ID } is the only attribute of the relation,
                            candidate key = { Registration_ID }

  Prime attributes        : Registration_ID

  Assumption              : -> Here, There aren't any specific assumptions for this relation.

  1NF Status              : -> Since the table doesn't contain any Multivalued or Composite attribute,
                               This relation is in 1NF Form.

  2NF Status              : -> Here, There are no Partial Dependencies in the relation.
                               This relation is in 2NF Form.

  3NF Status              : -> Here, There are no Transitive Dependencies in the relation.
                               This relation is in 3NF Form.

  BCNF Status             : -> Since, all the Functional Dependencies are determined by the SuperKey,
                               This relation is in BCNF Form.
```

- This relation holds the details for the Trip Registrations made by the customers.
- This will act as the source for providing the registration_ID's to facilitate the Registered_In relation for further use.

22) Registered_IN Relation :

```
Relation-22) Registered_IN

  Relation Schema         : Registered_IN(Package_ID, Login_ID, Registration_Id, Mode_Of_Payment, Currency, Ratings, Review_Status, Review)

  Functional_Dependencies : { Package_ID, Login_ID, Registration_ID } -> { Mode_Of_Payment, Currency, Ratings, Review_Status, Review }

  Candidate Key           : Since, { Package_ID, Login_ID, Registration_ID } Determines all other attributes of the relation,
                            candidate key = { { Package_ID, Login_ID, Registration_ID } }

  Prime attributes        : Package_ID, Login_ID, Registration_ID

  Assumption              : -> Here, There aren't any specific assumptions for this relation.

  1NF Status              : -> Since the table doesn't contain any Multivalued or Composite attribute,
                               This relation is in 1NF Form.

  2NF Status              : -> Here, There are no Partial Dependencies in the relation.
                               This relation is in 2NF Form.

  3NF Status              : -> Here, There are no Transitive Dependencies in the relation.
                               This relation is in 3NF Form.

  BCNF Status             : -> Since, all the Functional Dependencies are determined by the SuperKey,
                               This relation is in BCNF Form.
```

- This relation will hold the details about the customer's registration in a trip.
- Here, a customer can book the same trip with same companions multiple times, and so to differentiate each trip, we assign a registration_ID, which will help in segregating the trips.