

## Mapping of ERD to Relational Model:

### 1. Mapping of Strong Entity:

S.No.	Table Name	Attributes
1	User	<u>Email_id</u> , Password, Security_que, Secutiry_Ans, City, State, Pin_Code
2	User_Mobile	<u>Email_id</u> , Mobile
3	Passenger	<u>PNR</u> , Reservation_Status, Seat_No., Booked_by
4	Train	<u>Train_id</u> , Train_Name, Train_type, Available_class
5	Station	<u>Station_id</u> , Station_Name

### 2. Mapping of Weak Entity:

S.No.	Table Name	Attributes
1.	Train_Status	Train_id, Available_seats1, Available_seats2, Booked_seats1, Booked_seats2, Waiting_seats1, Waiting_seats2
2.	Route	Train_id, Stop_Number, Departure_Time, Arrival_time, Source_distance
3.	Train_Class	Train_id, Seat_class1, Seat_class2, Fare_class1, Fare_class2

### 3. Mapping of M:1 relationships:

Relation	Entities	Method	Connected By
Starts from	Train, Station	Foreign Key	Train_id, Station_id
Ends at	Train, Station	Foreign Key	Train_id, Station_id
Show Source	Passenger, Station	Foreign Key	PNR, Station_id
Show Destination	Passenger, Station	Foreign Key	PNR, Station_id
Has	Train, Route	Foreign Key	Train_id, Stop_number
Has	Train, Train_status	Foreign Key	Train_id, Available_dates

### 4. Mapping of M:N relationships:

Relation	Entities	Method	Connected By
Consists of	Station, Route	Foreign Key	Station_id, Stop_number (Route_Consist_of_Stations)

### 5. Mapping n-ary relationships:

Relation	Entities	Method	Connected By
Books	User, Passenger, Train_status	Cross-reference	Email_id, PNR, Available_seats

## Normalization:

<u>Relations already in 1NF</u>
User
Station
Train_Status
Route
Reservation
Route_Has_Station

Passenger and Train aren't in 1NF

- Passenger after 1NF

<u>PNR</u>	<u>Seat_Number</u>	Passenger_name	Age	Gender
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- Train after 1NF

<u>Train_Id</u>	Train_name	Train_type	Source_id	Destinatin_id
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<u>Relations in 2NF</u>
User
Station
Train_status
Route
Reservation
Route_Has_station
Train
Passenger

<u>Relations in 3NF</u>
User
Station
Train_status
Route
Reservation
Route_Has_station
Train
Passenger