INFO 6210 Database Design

Project Name: Online Railway Reservation System Database

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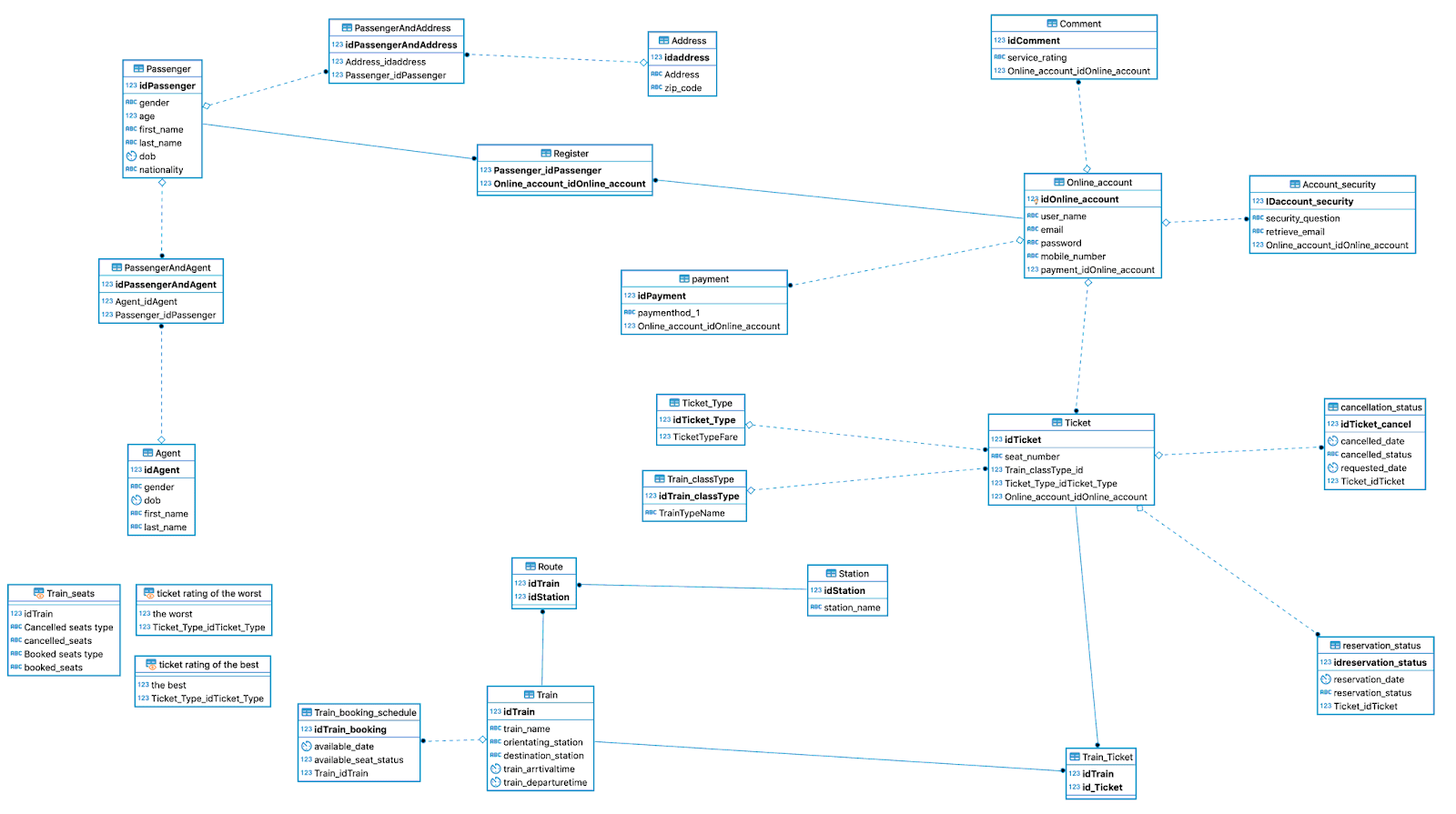
**Descriptions for Adjustments:**

* Under the Comment Entity, we added commentid as its own primary key, and online\_accountid becomes foregin key to that entity.
* Under the Payment Entity, we deleted attributes payment methods 2 and payment methods 3. Only keep one preferred payment method.
* For class\_type and ticket\_type entities, we were having repeating groups problems.
  + We deleted the original entity and created two entities to attach to Ticket entity: Train\_classtype and Ticket\_type
  + We used attribute TrainTypename and TicketTypename to display class types and ticket types.
  + Classtype and ticket\_type are FK in ticket entity. Classtype and ticket\_type are PK in their own entity.
* Because there are one to many relationships for ticket and reservation\_status, we added reservation\_Statusid as its primary key in reservation\_status table. The relationship is non-identifying, therefore, ticket\_id is the foreign key in reservation\_status table.
* At Agent entity, we changed the age into the date of birth for Agent, and we can use this information to get the agent age.
* Since there are many to many relationships for passenger and address, we created the associated entity named PassengerandAddress, which has its unique primary key (PassengerAndAddress\_id). The relationships are non-identifying, therefore, primary keys of passenger and address tables are foreign keys in PassengerAndAddress table.
* Since there are many-to-many relationships between Passenger and gent, we created an associate entity PassengerandAgent between Passenger and Agent. PassengerandAgent entity has its own unique primary key( PassengerandAgent\_id).The relationships are non-identifying, therefore, primary keys of passenger and Agent tables are foreign keys in PassengerAndAddress table
* We have Comment entity contains its own primary key (commentid), and (online\_accountid) is foreign key in comment entity. It is one-to-many non-identifying relationship between comment and Online\_account with option node at comment entity.
* Under the Account\_Security Entity, we deleted security\_q 2 and security\_q3 attributes and kept only one security\_question attribute.

**Business rules:**

1. The offline tickets sales will not appear at the database unless imported
2. Each online account may buy one or more tickets per time up to 10 tickets.
3. Each online account will have one mobile number
4. Each online account will have one user name
5. Each online account will have one email
6. Each online account may have zero or more rating service of comments
7. Each online account will have One Security Question
8. Each online account will have one retrieve email
9. Each online account may have zero or more emergency contact
10. Each online account will have one preferred Payment method.
11. Passenger must have one online account to purchase any ticket online.
12. Online Account can be able to purchase tickets if they are not passenger.
13. Each comments id will have one service rating (1-5).
14. Each Agent will have one date of birth.
15. Each Agent will have First name and last name.
16. Each Agent will have gender.
17. Each Passenger may have one online account.
18. Each Passenger may reach one Agent at the time.
19. Each Passenger may reach Agent multiple times.
20. Each Passenger will have one nationality.
21. Each passenger will have one date of birth.
22. Each Passenger will have one or more addresses.
23. Different Passenger may have the same address.
24. Each online account may have zero or more ticket cancellation. Meanwhile, the number of cancellations is less than or equals to the active number of tickets associated with this Passenger.
25. Each Passenger may buy zero or more ticket for self or for different passenger.
26. Each Passenger must have an online account to comment service rating.
27. Each Passenger must have an online account to access account security.
28. Each Ticket\_ID will have one class seat type name (A, B, C)
29. Each Ticket\_ID will have one ticket type name(1,2,3)
30. Each Ticket will have one variable reservation\_status
31. Each Ticket will not appear on the cacellation\_status table unless cancellation requested for the ticket
32. Ticket cancellation status will appear once the ticket is requested for cancellation
33. Each Ticket\_ID will be associated with one train
34. Each Ticket\_ID is unique
35. If a train is canceled due to unforeseen reasons, all tickets belong to that train will be canceled, and we will update the cancel date at the same time
36. Each train\_ID will have one or more arrival time
37. Each train\_ID will have one or more departure time
38. Each train will have three types of class seats
39. Each Route may have one or more Train ID
40. Each Route will have one or more Station ID
41. Each Train ID will have one originating and one destination
42. If a train has an orienting station, which must have a destination station, and vice versa.

**Final ERD**

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