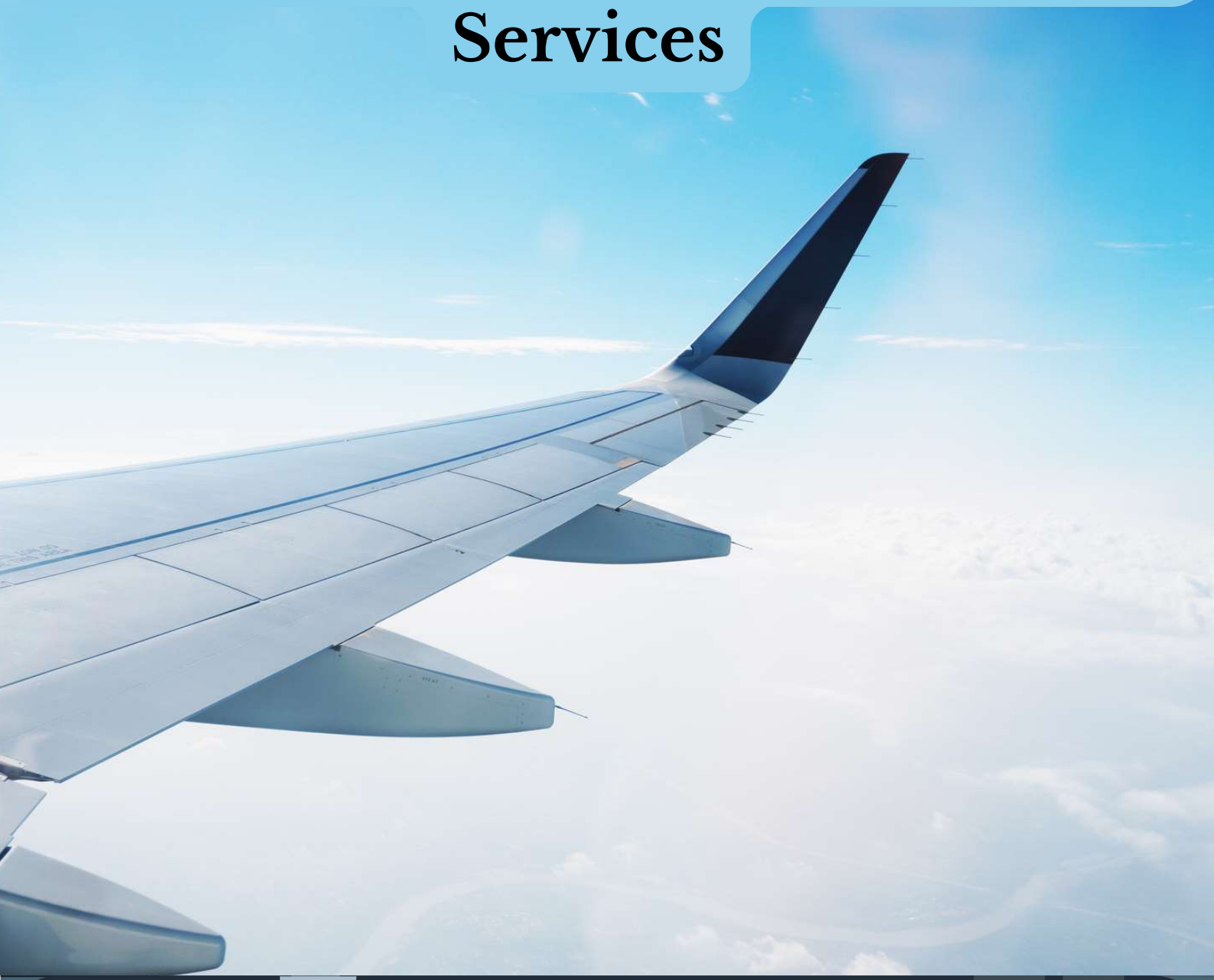
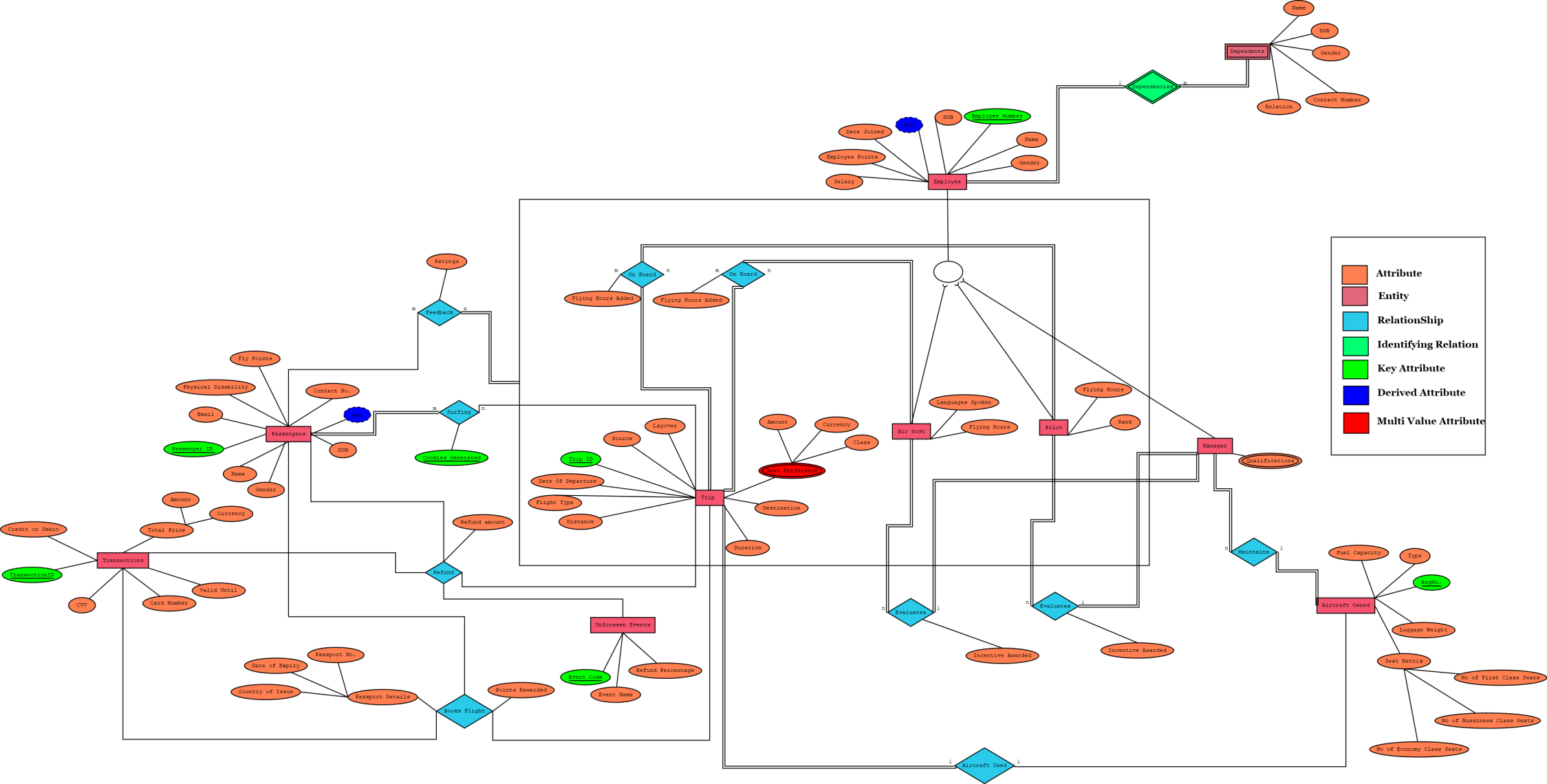
IT214 - DBMS GROUP PROJECT

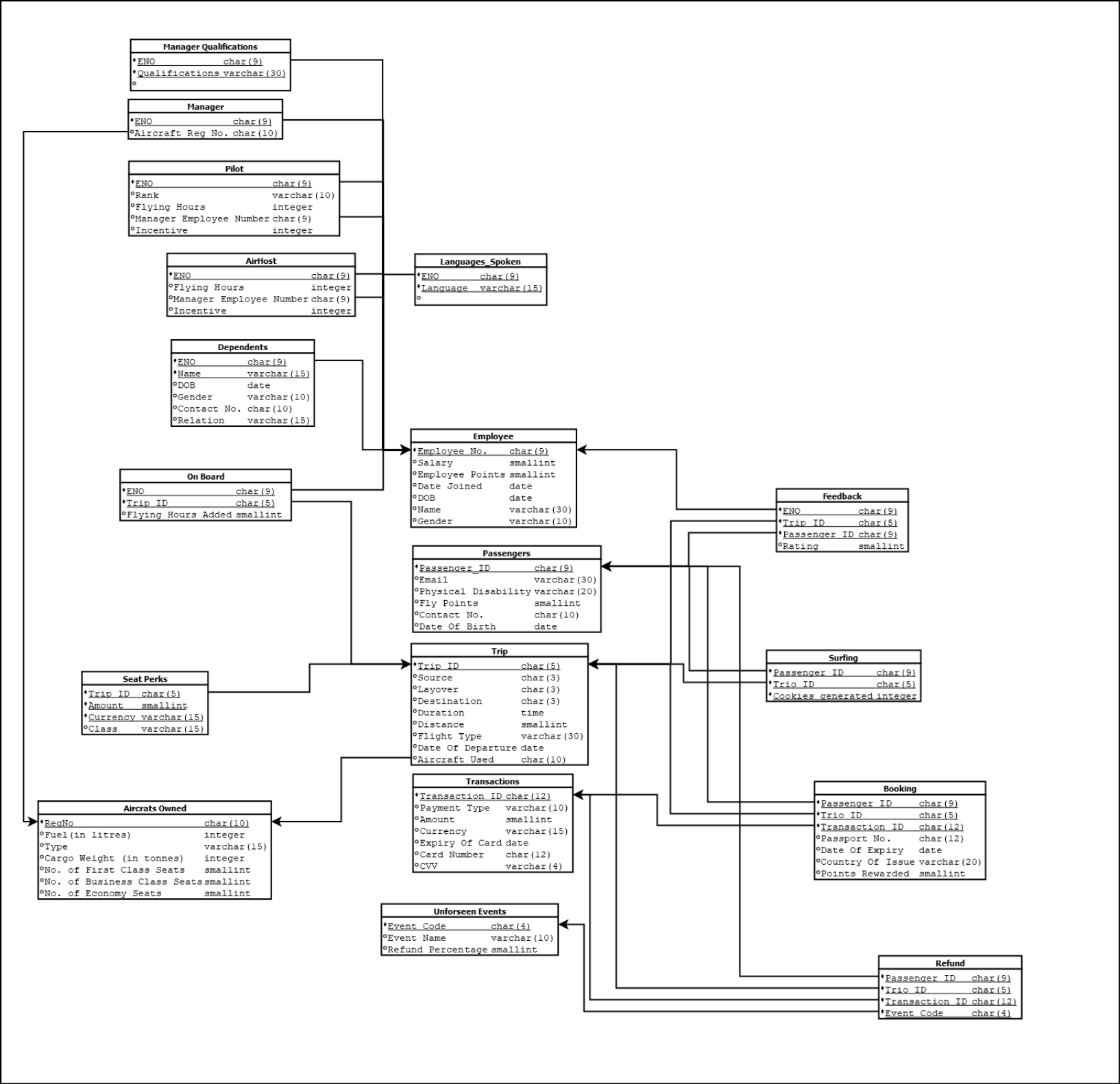
Project Title: AeroQuest Airline Services



Group Members

- 202201421 – Kkavy Dave
- 202201453 – Dev Vyas
- 202201458 – Srushti Makwana
- 202201460 – Shreya Patel


Name
DOB
Gender
Dependents
Relation
Contact Number
Dependencies
Date Joined
Age
DOB
Employee Number
Name
Employee Points
Gender
Salary
Employee
Ratings
Feedback
On Board
Flying Hours Added
On Board
Flying Hours Added
Fly Points
Physical Disability
Contact No.
Email
Passengers
Passenger ID
DOB
Name
Gender
Surfing
Cookies Generated
Source
Layover
Trip ID
Date Of Departure
Flight Type
Distance
Trip
Amount
Currency
Class
Seat Preference
Destination
Duration
Air host
Languages Spoken
Flying Hours
Pilot
Flying Hours
Rank
Manager
Qualifications
Amount
Currency
Total Price
Credit or Debit
TransactionID
Transactions
CVV
Card Number
Valid Until
Refund amount
Refund
Unforseen Events
Event Code
Event Name
Refund Percentage
Passport No.
Date of Expiry
Country of Issue
Passport Details
Books Flight
Points Rewarded
Evaluates
Incentive Awarded
Evaluates
Incentive Awarded
Maintains
Fuel Capacity
Type
RegNo.
Aircraft Owned
Luggage Weight
Seat Matrix
No of First Class Seats
No of Bussiness Class Seats
No of Economy Class Seats
Aircraft Used
Attribute
Entity
RelationShip
Identifying Relation
Key Attribute
Derived Attribute
Multi Value Attribute


Manager Qualifications
ENO char(9)
Qualifications varchar(30)
Manager
ENO char(9)
Aircraft Reg No. char(10)
Pilot
ENO char(9)
Rank varchar(10)
Flying Hours integer
Manager Employee Number char(9)
Incentive integer
AirHost
ENO char(9)
Flying Hours integer
Manager Employee Number char(9)
Incentive integer
Languages_Spoken
ENO char(9)
Language varchar(15)
Dependents
ENO char(9)
Name varchar(15)
DOB date
Gender varchar(10)
Contact No. char(10)
Relation varchar(15)
Employee
Employee No. char(9)
Salary smallint
Employee Points smallint
Date Joined date
DOB date
Name varchar(30)
Gender varchar(10)
On Board
ENO char(9)
Trip ID char(5)
Flying Hours Added smallint
Feedback
ENO char(9)
Trip ID char(5)
Passenger ID char(9)
Rating smallint
Passengers
Passenger_ID char(9)
Email varchar(30)
Physical Disability varchar(20)
Fly Points smallint
Contact No. char(10)
Date Of Birth date
Trip
Trip ID char(5)
Source char(3)
Layover char(3)
Destination char(3)
Duration time
Distance smallint
Flight Type varchar(30)
Date Of Departure date
Aircraft Used char(10)
Surfing
Passenger ID char(9)
Trio ID char(5)
Cookies generated integer
Seat Perks
Trip ID char(5)
Amount smallint
Currency varchar(15)
Class varchar(15)
Transactions
Transaction ID char(12)
Payment Type varchar(10)
Amount smallint
Currency varchar(15)
Expiry Of Card date
Card Number char(12)
CVV varchar(4)
Booking
Passenger ID char(9)
Trio ID char(5)
Transaction ID char(12)
Passport No. char(12)
Date Of Expiry date
Country Of Issue varchar(20)
Points Rewarded smallint
Aircrats Owned
RegNo char(10)
Fuel(in litres) integer
Type varchar(15)
Cargo Weight (in tonnes) integer
No. of First Class Seats smallint
No. of Business Class Seats smallint
No. of Economy Seats smallint
Unforseen Events
Event Code char(4)
Event Name varchar(10)
Refund Percentage smallint
Refund
Passenger ID char(9)
Trio ID char(5)
Transaction ID char(12)
Event Code char(4)

Functional Dependencies and their BCNF Reasoning along with their Minimal FD Set

<table>
<tr><td colspan="2">Table Name: Trip</td></tr>
<tr><td>Functional Dependencies
Trip ID -> Source
Trip ID -> Layover
Trip ID -> Destination
Trip ID -> Duration
Trip ID -> Distance
Trip ID -> Flight Type
Trip ID -> Date of Departure
Trip ID -> Aircraft Used
Trip ID -> Fuel (in liters)
Trip ID -> Type
Trip ID -> Cargo Weight (in tons)
Trip ID -> No. of First Class Seats
Trip ID -> No. of Business Class seats
Trip ID -> No. of Economy Class Seats</td><td rowspan="3">Key – Trip ID

Closure of the Trip ID gives us the entire relation and helps us determine all the attributes, hence is chosen</td></tr>
<tr><td>Minimal FD Set
Trip ID -> Source
Trip ID -> Layover
Trip ID -> Destination
Trip ID -> Duration
Trip ID -> Distance
Trip ID -> Flight Type
Trip ID -> Date of Departure
Trip ID -> Aircraft Used</td></tr>
<tr><td>BCNF
For all functional dependencies the determinant is the super key of the relation hence the given relation is in BCNF</td></tr>
</table>

<table>
<tr><td colspan="2">Table Name: Surfing</td></tr>
<tr><td>Functional Dependencies
No Functional Dependencies</td><td rowspan="3">Key - {Passenger ID, Trip ID, Cookies Generated}

Closure of the {Passenger ID, Trip ID, Cookies Generated} gives us the entire relation and helps us determine all the attributes, hence is chosen</td></tr>
<tr><td>Minimal FD Set
The minimal set is the same as above, as it does not contain any inferred dependencies. It is already in canonical form.</td></tr>
<tr><td>BCNF
As it does not have any FD’s it is already a BCNF.</td></tr>
</table>

<table>
<tr><td colspan="2">Table Name: Booking</td></tr>
<tr><td>Functional Dependencies
{Passenger ID, Trip ID, Transaction ID} -> Passport No.
{Passenger ID, Trip ID, Transaction ID} -> Date of Expiry
{Passenger ID, Trip ID, Transaction ID} -> Country of Issue
{Passenger ID, Trip ID, Transaction ID} -> Points Rewarded</td><td rowspan="3">Key - {Passenger ID, Trip ID, Transaction ID}

Closure of the {Passenger ID, Trip ID, Transaction ID} gives us the entire relation and helps us determine all the attributes, hence is chosen</td></tr>
<tr><td>Minimal FD Set
The minimal set is the same as above, as it does not contain any inferred dependencies. It is already in canonical form.</td></tr>
<tr><td>BCNF
For all functional dependencies the determinant is the super key of the relation hence the given relation is in BCNF</td></tr>
</table>

<table>
<tr><th colspan="2">Table Name: Transactions</th></tr>
<tr><td>Functional Dependencies
Transaction ID -> Payment Type
Transaction ID -> Amount
Transaction ID -> Currency
Transaction ID -> Expiry of Card date
Transaction ID -> Card Number
Transaction ID -> CVV</td><td rowspan="3">Key – Transaction ID

Closure of the Transaction ID gives us the entire relation and helps us determine all the attributes, hence is chosen</td></tr>
<tr><td>Minimal FD Set
The minimal set is the same as above, as it does not contain any inferred dependencies. It is already in canonical form.</td></tr>
<tr><td>BCNF
For all functional dependencies the determinant is the super key of the relation hence the given relation is in BCNF</td></tr>
</table>

<table>
<tr><th colspan="2">Table Name: Refund</th></tr>
<tr><td>Functional Dependencies
No FDs</td><td rowspan="3">Key - {Passenger ID, Trip ID, Transaction ID, Event Code}

Closure of the {Passenger ID, Trip ID, Transaction ID, Event Code} gives us the entire relation and helps us determine all the attributes, hence is chosen</td></tr>
<tr><td>Minimal FD Set
The minimal set is the same as above, as it does not contain any inferred dependencies. It is already in canonical form.</td></tr>
<tr><td>BCNF
As it does not contain any FDs, it is already in BCNF.</td></tr>
</table>

<table>
<tr><td colspan="2">Table Name: Passengers</td></tr>
<tr><td>Functional Dependencies
Passenger ID -> Email
Passenger ID -> Physical Disability
Passenger ID -> Fly Points
Passenger ID -> Contact No.
Passenger ID -> Date of Birth</td><td rowspan="3">Key – Passenger ID

Closure of the Passenger ID gives us the entire relation and helps us determine all the attributes, hence is chosen</td></tr>
<tr><td>Minimal FD Set
The minimal set is the same as above, as it does not contain any inferred dependencies. It is already in canonical form.</td></tr>
<tr><td>BCNF
For all functional dependencies the determinant is the super key of the relation hence the given relation is in BCNF</td></tr>
</table>

<table>
<tr><td colspan="2">Table Name: Employee</td></tr>
<tr><td>Functional Dependencies
Employee No. -> Salary
Employee No. -> Employee Points
Employee No. -> Date Joined
Employee No. -> DOB
Employee No. -> Name
Employee No. -> Gender</td><td rowspan="3">Key - Employee No

Closure of the Employee No gives us the entire relation and helps us determine all the attributes, hence is chosen</td></tr>
<tr><td>Minimal FD Set
The minimal set is the same as above, as it does not contain any inferred dependencies. It is already in canonical form.</td></tr>
<tr><td>BCNF
For all functional dependencies the determinant is the super key of the relation hence the given relation is in BCNF</td></tr>
</table>

<table>
<tr><th colspan="2">Table Name: Dependents</th></tr>
<tr><td>Functional Dependencies
{ENO, Name} -> DOB
{ENO, Name} -> Gender
{ENO, Name} -> Contact No.
{ENO, Name} -> Relation</td><td rowspan="3">Key - {ENO, Name}

Closure of the {ENO, Name} gives us the entire relation and helps us determine all the attributes, hence is chosen</td></tr>
<tr><td>Minimal FD Set
The minimal set is the same as above, as it does not contain any inferred dependencies. It is already in canonical form.</td></tr>
<tr><td>BCNF
For all functional dependencies the determinant is the super key of the relation hence the given relation is in BCNF</td></tr>
</table>

<table>
<tr><th colspan="2">Table Name: On Board</th></tr>
<tr><td>Functional Dependencies
{ENO, Trip ID} -> Flying Hours Added</td><td rowspan="3">Key - {ENO, Trip ID}

Closure of the {ENO, Trip ID} gives us the entire relation and helps us determine all the attributes, hence is chosen</td></tr>
<tr><td>Minimal FD Set
The minimal set is the same as above, as it does not contain any inferred dependencies. It is already in canonical form.</td></tr>
<tr><td>BCNF
For all functional dependencies the determinant is the super key of the relation hence the given relation is in BCNF</td></tr>
</table>

<table>
<tr><td colspan="2">Table Name: Air Host</td></tr>
<tr><td>Functional Dependencies
ENO -> Flying Hours
ENO -> Manager Employee Number
ENO -> Incentive
ENO -> Salary
ENO -> Employee Points
ENO -> Date Joined
ENO -> DOB
ENO -> Name
ENO -> Gender
ENO -> Mgr_Aircraft Reg No
ENO -> Mgr_Aircraft Fuel (in litres)
ENO -> Mgr_Aircraft Type
ENO -> Mgr_Aircraft Cargo Weight (in tonnes)
ENO -> Mgr_Aircraft No. of First-Class Seats
ENO -> Mgr_Aircraft No. of Business Seats
ENO -> Mgr_Aircraft No. of Economy Seats
ENO -> Mgr_Qualifications</td><td rowspan="3">Key – ENO

Closure of the ENO gives us the entire relation and helps us determine all the attributes, hence is chosen</td></tr>
<tr><td>Minimal FD Set
ENO -> Flying Hours
ENO -> Manager Employee Number
ENO -> Incentive</td></tr>
<tr><td>BCNF
For all functional dependencies the determinant is the super key of the relation hence the given relation is in BCNF</td></tr>
</table>

<table>
<tr><td colspan="2">Table Name: Pilot</td></tr>
<tr><td>Functional Dependencies
ENO -> Rank
ENO -> Manager Employee Number
ENO -> Incentive
ENO -> Salary
ENO -> Employee Points
ENO -> Date Joined
ENO -> DOB
ENO -> Name
ENO -> Gender
ENO -> Mgr_Aircraft Reg No
ENO -> Mgr_Aircraft Fuel (in litres)
ENO -> Mgr_Aircraft Type
ENO -> Mgr_Aircraft Cargo Weight (in tonnes)
ENO -> Mgr_Aircraft No. of First-Class Seats
ENO -> Mgr_Aircraft No. of Business Seats
ENO -> Mgr_Aircraft No. of Economy Seats
ENO -> Mgr_Qualifications</td><td rowspan="3">Key - ENO

Closure of the ENO gives us the entire relation and helps us determine all the attributes, hence is chosen</td></tr>
<tr><td>Minimal FD Set
ENO -> Rank
ENO -> Flying Hours
ENO -> Manager Employee Number
ENO -> Incentive</td></tr>
<tr><td>BCNF
For all functional dependencies the determinant is the super key of the relation hence the given relation is in BCNF</td></tr>
</table>

<table>
<tr><td colspan="2">Table Name: Manager</td></tr>
<tr><td>Functional Dependencies
ENO -> Aircraft Reg No
ENO -> Fuel (in litres)
ENO -> Type
ENO -> Cargo Weight (in tonnes)
ENO -> No. of First-Class Seats
ENO -> No. of Business Seats
ENO -> No. of Economy Seats</td><td rowspan="3">Key - ENO

Closure of the ENO gives us the entire relation and helps us determine all the attributes, hence is chosen</td></tr>
<tr><td>Minimal FD Set
ENO -> Aircraft Reg No</td></tr>
<tr><td>BCNF
For all functional dependencies the determinant is the super key of the relation hence the given relation is in BCNF</td></tr>
</table>

<table>
<tr><td colspan="2">Table Name: Manager Qualifications</td></tr>
<tr><td>No functional dependency</td><td rowspan="3">Key - {ENO, Qualifications}

Closure of the {ENO, Qualifications} gives us the entire relation and helps us determine all the attributes, hence is chosen</td></tr>
<tr><td>Minimal FD Set
The minimal set is the same as above, as it does not contain any inferred dependencies. It is already in canonical form.</td></tr>
<tr><td>BCNF
As it does not have any FD’s it is already a BCNF.</td></tr>
</table>

<table>
<tr><td colspan="2">Table Name: Language Spoken</td></tr>
<tr><td>No functional dependency</td><td rowspan="3">Key - {ENO, Language}

Closure of the {ENO, Language} gives us the entire relation and helps us determine all the attributes, hence is chosen</td></tr>
<tr><td>Minimal FD Set
The minimal set is the same as above, as it does not contain any inferred dependencies. It is already in canonical form.</td></tr>
<tr><td>BCNF
As it does not have any FD’s it is already a BCNF.</td></tr>
</table>

<table>
<tr><td colspan="2">Table Name : Feedback</td></tr>
<tr><td>{ENO, Trip ID, Passenger ID} -> Rating</td><td rowspan="3">Key – {ENO, Trip ID, Passenger ID}

Closure of the {ENO, Trip ID, Passenger ID} gives us the entire relation and helps us determine all the attributes, hence is chosen</td></tr>
<tr><td>Minimal FD Set
The minimal set is the same as above, as it does not contain any inferred dependencies. It is already in canonical form.</td></tr>
<tr><td>BCNF
For all functional dependencies the determinant is the super key of the relation hence the given relation is in BCNF</td></tr>
</table>

<table>
<tr><td colspan="2">Table Name : Aircrafts Owned</td></tr>
<tr><td>Functional Dependencies
RegNo -> Fuel (in litres)
RegNo -> Type
RegNo -> Cargo Weight (in tonnes)
RegNo -> No. of First-Class Seats
RegNo -> No. of Business Seats
RegNo -> No. of Economy Seats</td><td rowspan="3">Key – RegNo

Closure of the RegNo gives us the entire relation and helps us determine all the attributes, hence is chosen</td></tr>
<tr><td>Minimal FD Set
The minimal set is the same as above, as it does not contain any inferred dependencies. It is already in canonical form.</td></tr>
<tr><td>BCNF
For all functional dependencies the determinant is the super key of the relation hence the given relation is in BCNF</td></tr>
</table>

<table>
<tr><td colspan="2">Table Name : Seat Perks</td></tr>
<tr><td>Functional Dependencies
{Trip ID, Amount, Currency} -> Class</td><td rowspan="3">Key - {Trip ID, Amount, Currency}

Closure of the {Trip ID, Amount, Currency} gives us the entire relation and helps us determine all the attributes, hence is chosen</td></tr>
<tr><td>Minimal FD Set
The minimal set is the same as above, as it does not contain any inferred dependencies. It is already in canonical form.</td></tr>
<tr><td>BCNF
For all functional dependencies the determinant is the super key of the relation hence the given relation is in BCNF</td></tr>
</table>

<table>
<tr><td colspan="2">Table Name : Unforeseen Events</td></tr>
<tr><td>Functional Dependencies
Event Code -> Event Name
Event Code -> Refund Percentage</td><td rowspan="3">Key - Event Code

Closure of the Event Code gives us the entire relation and helps us determine all the attributes, hence is chosen</td></tr>
<tr><td>Minimal FD Set
The minimal set is the same as above, as it does not contain any inferred dependencies. It is already in canonical form.</td></tr>
<tr><td>BCNF
For all functional dependencies the determinant is the super key of the relation hence the given relation is in BCNF</td></tr>
</table>