From the diagram, we can identify the following entities and their attributes:









**Ticket**: Ticket\_Number (PK), Ticket\_Status, Ticket\_Price, and Seat\_Number

**Passenger**: National \_ID (PK), First\_Name, Last\_Name, Phone\_Number, and Gender

**Transaction**: Transaction\_ID (PK), Date, and Total\_Amount

**Payment\_Type**: Payment\_Code (PK), Payment\_Method, and Payment\_Type

Normalization:

Operate by

**UNF:**

Operate by(Driver\_Id, First\_Name, Last\_Name, License\_Number, Experience\_Year, Bus\_Number, Type, Model, Capacity)

**1NF:**

There is no multivalued attribute. Relation is already in 1NF.

1. Driver\_Id, First\_Name, Last\_Name, License\_Number, Experience\_Year,

Bus\_Number, Type, Model, Capacity

**2NF:**

1. Driver\_Id, First\_Name, Last\_Name, License\_Number, Experience\_Year
2. Bus\_Number, Type, Model, Capacity

**3NF:**

Name is transitive attribute.

1. Driver\_Id, License\_Number, Experience\_Year
2. First\_Name, Last\_Name
3. Bus\_Number, Type, Model, Capacity

**Table Creation:**

1. Driver\_Id, License\_Number, Experience\_Year, Bus\_Number, N\_Id
2. N\_Id, First\_Name, Last\_Name
3. Bus\_Number, Type, Model, Capacity

Follows:

**UNF:**

Follows( Bus\_Number, Type, Model, Capacity, Route\_Id , Start\_Location, End\_Location, Distance, Departure\_Time)

**1NF:**

There is no multivalued attribute. Relation is already in 1NF.

1. Bus\_Number, Type, Model, Capacity, Route\_Id , Start\_Location, End\_Location, Distance, Departure\_Time

**2NF:**

1. Bus\_Number, Type, Model, Capacity
2. Route\_Id , Start\_Location, End\_Location, Distance, Departure\_Time

**3NF:**

Destination is transitive attribute.

1. Bus\_Number, Type, Model, Capacity
2. Route\_Id , Distance, Departure\_Time
3. Start\_Location, End\_Location

**Table Creation:**

1. Bus\_Number, Type, Model, Capacity,
2. Route\_Id , Distance, Departure\_Time, Bus\_Number, L\_Id
3. L\_Id, Start\_Location, End\_Location

Conducts

**UNF:**

Conducts( Bus\_Number, Type, Model, Capacity, Supervisor\_Id, First\_Name, Last\_Name, Experience\_Year)

**1NF:**

There is no multivalued attribute. Relation is already in 1NF.

1. Bus\_Number, Type, Model, Capacity, Supervisor\_Id, First\_Name, Last\_Name, Experience\_Year

**2NF:**

1. Bus\_Number, Type, Model, Capacity
2. Supervisor\_Id, First\_Name, Last\_Name, Experience\_Year

**3NF:**

Name is Transitive attribute.

1. Bus\_Number, Type, Model, Capacity
2. Supervisor\_Id, Experience\_Year
3. First\_Name, Last\_Name

**Table Creation:**

1. Bus\_Number, Type, Model, Capacity
2. Supervisor\_Id, Experience\_Year, Bus\_Number, N\_Id
3. N\_Id, First\_Name, Last\_Name.

Assign

**UNF:**

Assign (Bus\_Number, Type, Model, Capacity, Ticket\_Number, Ticket\_Status, Ticket\_Price, Seat\_Number)

**1NF:**

There is no multivalued attribute. Relation is already in 1NF.

1. Bus\_Number, Type, Model, Capacity, Ticket\_Number, Ticket\_Status, Ticket\_Price, Seat\_Number

**2NF:**

1. Bus\_Number, Type, Model, Capacity
2. Ticket\_Number, Ticket\_Status, Ticket\_Price, Seat\_Number

**3NF:**

There is no transitive attribute. Relation is already in 3NF.

1. Bus\_Number, Type, Model, Capacity
2. Ticket\_Number, Ticket\_Status, Ticket\_Price, Seat\_Number

**Table Creation:**

1. Bus\_Number, Type, Model, Capacity
2. Ticket\_Number, Ticket\_Status, Ticket\_Price, Seat\_Number, Bus\_Number

Buy

**UNF:**

Buy(Ticket\_Number, Ticket\_Status, Ticket\_Price, Seat\_Number, National\_Id, First\_Name, Last\_Name, Gender, Phone\_Number)

**1NF:**

Phone\_Number is multivalued attribute.

1. Ticket\_Number, Ticket\_Status, Ticket\_Price, Seat\_Number, National\_Id, First\_Name, Last\_Name, Gender, Phone\_Number

**2NF:**

1. Ticket\_Number, Ticket\_Status, Ticket\_Price, Seat\_Number
2. National\_Id, First\_Name, Last\_Name, Gender, Phone\_Number

**3NF:**

Name is transitive attribute.

1. Ticket\_Number, Ticket\_Status, Ticket\_Price, Seat\_Number
2. National\_Id, Gender, Phone\_Number
3. First\_Name, Last\_Name

**Table Creation:**

1. Ticket\_Number, Ticket\_Status, Ticket\_Price, Seat\_Number, National\_Id, N\_Id
2. National\_Id, Gender, Phone\_Number
3. N\_Id, First\_Name, Last\_Name

Makes

**UNF:**

Makes(National\_Id, First\_Name, Last\_Name, Gender, Phone\_Number, Transaction\_Id, Date, Total\_Amount)

**1NF:**

Phone\_Number is multivalued attribute.

1. National\_Id, First\_Name, Last\_Name, Gender, Phone\_Number, Transaction\_Id, Date, Total\_Amount

**2NF:**

1. National\_Id, First\_Name, Last\_Name, Gender, Phone\_Number
2. Transaction\_Id, Date, Total\_Amount

**3NF:**

Name is transitive attribute.

1. National\_Id, Gender, Phone\_Number
2. First\_Name, Last\_Name,
3. Transaction\_Id, Date, Total\_Amount

**Table Creation:**

1. National\_Id, Gender, Phone\_Number
2. N\_Id, First\_Name, Last\_Name
3. Transaction\_Id, Date, Total\_Amount, National\_Id, N\_Id

Contains

**UNF:**

Contains( Ticket\_Number, Ticket\_Status, Ticket\_Price, Seat\_Number, Transaction\_Id, Date, Total\_Amount.)

**1NF:**

There is no multivalued attribute. Relation is already in 1NF.

1. Ticket\_Number, Ticket\_Status, Ticket\_Price, Seat\_Number, Transaction\_Id, Date, Total\_Amount

**2NF:**

1. Ticket\_Number, Ticket\_Status, Ticket\_Price, Seat\_Number
2. Transaction\_Id, Date, Total\_Amount

**3NF:**

There is no transitive attribute.

1. Ticket\_Number, Ticket\_Status, Ticket\_Price, Seat\_Number
2. Transaction\_Id, Date, Total\_Amount

**Table Creation:**

1. Ticket\_Number, Ticket\_Status, Ticket\_Price, Seat\_Number, Transaction\_Id
2. Transaction\_Id, Date, Total\_Amount

Uses

**UNF:**

Uses(Transaction\_Id, Date, Total\_Amount, Payment\_Code, Payment\_Method, Payment\_Type)

**1NF:**

There is no multivalued attribute. Relation is already in 1NF.

1. Transaction\_Id, Date, Total\_Amount, Payment\_Code, Payment\_Method, Payment\_Type

**2NF:**

1. Transaction\_Id, Date, Total\_Amount
2. Payment\_Code, Payment\_Method, Payment\_Type

**3NF:**

There is no transitive attribute. Relation is already in 3NF.

1. Transaction\_Id, Date, Total\_Amount
2. Payment\_Code, Payment\_Method, Payment\_Type

**Table Creation:**

1. Transaction\_Id, Date, Total\_Amount
2. Payment\_Code, Payment\_Method, Payment\_Type, Transaction\_Id

Issues

**UNF:**

Issues(Supervisor\_Id, First\_Name, Last\_Name, Experience\_Year, Ticket\_Number, Ticket\_Status, Ticket\_Price, Seat\_Number)

**1NF:**

There is no multivalued attribute. Relation is already in 1NF.

1. Supervisor\_Id, First\_Name, Last\_Name, Experience\_Year, Ticket\_Number, Ticket\_Status, Ticket\_Price, Seat\_Number.

**2NF:**

1. Supervisor\_Id, First\_Name, Last\_Name, Experience\_Year
2. Ticket\_Number, Ticket\_Status, Ticket\_Price, Seat\_Number

**3NF:**

Name is transitive attribute.

1. Supervisor\_Id, Experience\_Year
2. First\_Name, Last\_Name
3. Ticket\_Number, Ticket\_Status, Ticket\_Price, Seat\_Number

**Table Creation:**

1. Supervisor\_Id, Experience\_Year.
2. N\_Id, First\_Name, Last\_Name.
3. Ticket\_Number, Ticket\_Status, Ticket\_Price, Seat\_Number, Supervisor\_Id, N\_Id

**Temporary Tables:**

1. Driver\_Id, License\_Number, Experience\_Year, Bus\_Number, N\_Id
2. N\_Id, First\_Name, Last\_Name
3. Bus\_Number, Type, Model, Capacity
4. ~~Bus\_Number, Type, Model, Capacity~~
5. Route\_Id , Distance, Departure\_Time, Bus\_Number, L\_Id
6. L\_Id, Start\_Location, End\_Location
7. ~~Bus\_Number, Type, Model, Capacity~~
8. Supervisor\_Id, Experience\_Year, Bus\_Number, N\_Id
9. ~~N\_Id, First\_Name, Last\_Name.~~
10. ~~Bus\_Number, Type, Model, Capacity~~
11. Ticket\_Number, Ticket\_Status, Ticket\_Price, Seat\_Number, Bus\_Number
12. Ticket\_Number, Ticket\_Status, Ticket\_Price, Seat\_Number, National\_Id, N\_Id
13. National\_Id, Gender, Phone\_Number
14. ~~National\_Id, Gender, Phone\_Number~~
15. ~~N\_Id, First\_Name, Last\_Name~~
16. Transaction\_Id, Date, Total\_Amount, National\_Id, N\_Id
17. Ticket\_Number, Ticket\_Status, Ticket\_Price, Seat\_Number, Transaction\_Id
18. Transaction\_Id, Date, Total\_Amount
19. ~~Transaction\_Id, Date, Total\_Amount~~
20. Payment\_Code, Payment\_Method, Payment\_Type, Transaction\_Id
21. Supervisor\_Id, Experience\_Year
22. ~~N\_Id, First\_Name, Last\_Name~~
23. Ticket\_Number, Ticket\_Status, Ticket\_Price, Seat\_Number, Supervisor\_Id, N\_Id

**Final Tables:**

1. Driver\_Id, License\_Number, Experience\_Year, Bus\_Number, N\_Id
2. N\_Id, First\_Name, Last\_Name
3. Bus\_Number, Type, Model, Capacity
4. Route\_Id , Distance, Departure\_Time, Bus\_Number, L\_Id
5. L\_Id, Start\_Location, End\_Location
6. Supervisor\_Id, Experience\_Year, Bus\_Number, N\_Id
7. Ticket\_Number, Ticket\_Status, Ticket\_Price, Seat\_Number, Bus\_Number
8. Ticket\_Number, Ticket\_Status, Ticket\_Price, Seat\_Number, National\_Id, N\_Id
9. National\_Id, Gender, Phone\_Number
10. Transaction\_Id, Date, Total\_Amount, National\_Id, N\_Id
11. Ticket\_Number, Ticket\_Status, Ticket\_Price, Seat\_Number, Transaction\_Id
12. Transaction\_Id, Date, Total\_Amount
13. Payment\_Code, Payment\_Method, Payment\_Type, Transaction\_Id
14. Supervisor\_Id, Experience\_Year
15. Ticket\_Number, Ticket\_Status, Ticket\_Price, Seat\_Number, Supervisor\_Id, N\_Id