Airport Management System

Group ID: T205

Group members:

NAME	STUDENT ID
Sahil Chaudhari	202201171
Yash Rathod	202201524
Sunil Rathva	202201477
David Lochan Baro	202201132

PROOF OF NORMALIZATION

1. FLIGHTS RELATION

Flights(FlightID, fdate, Departure_time, Ticketprice, AircraftID, Flight_From, Flight_To, Arrival_time)

Key: FlightId

FKs: AircraftID

Fds:

FlightID -> fdate
FlightID -> Departure_time
FlightID -> Arrival_time
FlightID -> Ticketprice
FlightID -> AircraftID
FlightID -> Flight_from
FlightID -> Flight_to

Candidate key: FlightId

BCNF Proof :

For every dependencies of minimal FD set, Each determinant of relation is a candidate key.
Hence the relation is BCNF.

2. AIRLINES RELATION

Airlines (AirlineID, Airlinename, Website_url, Operating_country, Headquarters, email, Phone_no)

Key: AirlineId

FKs: NO

Fds:

AirlineID -> Airlinename
Airlinename -> website_url
website_url -> Email
Email -> Phone_no
Phone_no -> AirlineID
AirlineID -> Operating_country

Candidate key: {AirlineID, Airlinename, Email, Phone_no, website_url}

BCNF Proof :

For every dependencies of minimal FD set, Each determinant of relation is a candidate key.
Hence the relation is BCNF.

3. AIRCRAFT RELATION

(AircraftID, Manufacture_date, capacity, Model, AirlineID, Manufacturer_name)

Key: AircraftID

FKs: AirlineID, Manufacturer_name

Fds:

AircraftID -> Manufacture_date
AircraftID -> Manufacturer_name
AircraftID -> Capacity
AircraftID -> Model
AircraftID -> AirlineID

Candidate key: AircraftID

BCNF Proof :

For every dependencies of minimal FD set, Each determinant of relation is a candidate key.
Hence the relation is BCNF.

4. BOOKING RELATION

(BookingID, BookingDate, Ticket_cost, FlightID,Payment_type)

Key: BookingID

FKs: FlightID

Fds:

BookingID -> Bookingdate
BookingID -> Ticket_cost
BookingID -> FlightID
BookingID -> Payment_type

Candidate key: BookingID

BCNF Proof :

For every dependencies of minimal FD set, Each determinant of relation is a candidate key.
Hence the relation is BCNF.

5. PASSENGER RELATION

(PassengerID, Gender, Age, Name, Phone_no, Nationality, Email)

Key: PassengerID

FKs: NO

Fds:

PassengerID -> Phone_no
Phone_no -> Email
Email -> Gender
Email-> PassengerID
Email -> Age
Email -> Nationality

Candidate key: {PAssengerID, Phone_no, Email}

BCNF Proof :

For every dependencies of minimal FD set, Each determinant of relation is a candidate key.
Hence the relation is BCNF.

6. BAGGAGES RELATION

(BaggageID, Type, Dimention, Weight, PassengerID)

Key: BaggageID

FKs: PassengerID

Fds:

BaggagesID -> Type
BaggagesID -> Weight
BaggagesID -> Dimention
BaggagesID -> PassengerID

Candidate key: BaggagesID

BCNF Proof :

For every dependencies of minimal FD set, Each determinant of relation is a candidate key.
Hence the relation is BCNF.

7. AIRPORTS RELATION

(AirportID, Airport_name, City, Capacity)

Key: AirportID

FKs: NO

Fds:

AirportID -> Airport_name
AirportID -> City
AirportID -> Capacity

Candidate Key: AirportID

BCNF Proof :

For every dependencies of minimal FD set, Each determinant of relation is a candidate key.
Hence the relation is BCNF.

8. STATE RELATION

Key: City

FKs: NO

FDs:

City -> State

Candidate Key: City

BCNF Proof :

For every dependencies of minimal FD set, Each determinant of relation is a candidate key.

Hence the relation is BCNF.

9. Country Relation

Key: State

FKs: NO

Fds:
State -> Country

Candidate Key: State

BCNF Proof :

For every dependencies of minimal FD set, Each determinant of relation is a candidate key.
Hence the relation is BCNF.

10. Employee Relation

Key: EmployeeID

FKs: AirportID

Fds:
EmployeeID -> Phone_no
Phone_no -> Email
Email ->EmployeeID
EmployeeID -> AirportID
EmployeeID -> Name
EmployeeID -> Dob
EmployeeID -> Joining_date
EmployeeID -> Salary
EmployeeID -> Gender

Candidate Key: {EmployeeID, Phone_no, Email}

BCNF Proof :

For every dependencies of minimal FD set, Each determinant of relation is a candidate key.
Hence the relation is BCNF.

11. Manufacturer Relation

Key: Manufacturer_name

FKs: NO

Fds:

Manufacturer_name -> Country

Candidate Key: Manufacturer_name

BCNF Proof :

For every dependencies of minimal FD set, Each determinant of relation is a candidate key.
Hence the relation is BCNF.

12. Maintenance Relation

Key: RecordID

FKs: AircraftID

Fds:

RecordID -> Task_performed
RecordID -> Notes
RecordID -> Date_of_maintenance
RecordID -> AircraftID

Candidate Key: RecordID

BCNF Proof :

For every dependencies of minimal FD set, Each determinant of relation is a candidate key.
Hence the relation is BCNF.

13. Vehicle Relation

Key: VID

FKs: AirportID

Fds:

VID -> V-type
VID -> AirportID

Candidate Key: VID

BCNF Proof :

For every dependencies of minimal FD set, Each determinant of relation is a candidate key.
Hence the relation is BCNF.

14. Includes Relation

Key: {PassengerID , BookingID}

FKs: PassengerID, BookingID

Fds:

{PassengerID , BookingID} -> Seat_no

Candidate Key: {PassengerID , BookingID}

BCNF Proof :

For every dependencies of minimal FD set, Each determinant of relation is a candidate key.
Hence the relation is BCNF.

15. Scheduled Relation

Key: { FlightID , AirportID }

FKs: FlightID , AirportID

Fds:

{ FlightID , AirportID } -> Time
{ FlightID , AirportID } -> Flight_type

Candidate Key: { FlightID , AirportID }

BCNF Proof :

For every dependencies of minimal FD set, Each determinant of relation is a candidate key.
Hence the relation is BCNF.

16. MAINTENANCE_CREW RELATION

Key: EmployeeID

FKs: EmployeeID

Fds:

EmployeeID -> Specialization
EmployeeID -> Task

Candidate Key: EmployeeID

BCNF Proof :

For every dependencies of minimal FD set, Each determinant of relation is a candidate key.
Hence the relation is BCNF.

17. CLEANING_STAFF RELATION

Key: EmployeeID

FKs: EmployeeID

Fds:
EmployeeID -> Area

Candidate Key: EmployeeID

BCNF Proof :

For every dependencies of minimal FD set, Each determinant of relation is a candidate key.
Hence the relation is BCNF.

18. DRIVER RELATION

Key: EmployeeID

FKs: EmployeeID , VID
Fds:
EmployeeID -> Area
EmployeeID -> VID

Candidate Key: EmployeeID

BCNF Proof :

For every dependencies of minimal FD set, Each determinant of relation is a candidate key.
Hence the relation is BCNF.