**Group No:** 7

TA: Kashyap Nirmal (202011031)

## Group members:

* Riya Dineshkumar Soni (202012025)
* Kakkan Anurag Kishor (202012026)
* Gandhi Viral Ashok (202012027)
* Sukhadia Rutvi Kumarpal (202012028)
* Shah Siddhant Alkeshbhai (202018013)
* Shah Nihar Shaileshbhai (202018014)

**Tourism Management System**

**Functional Dependencies, Constraints**

**And Normal Forms**

1)

Table:

**User** **(UserAadharNo, Fname, Lname, Email, Phone, Gender, Age)**

Functional Dependencies:

UserAadharNo → Fname

UserAadharNo → Lname

UserAadharNo → Email

UserAadharNo → Phone

UserAadharNo → Gender

UserAadharNo → Age

Email → UserAadharNo

Email → Fname

Email → Lname

Email → Phone

Email → Gender

Email → Age

Phone → UserAadharNo

Phone → Fname

Phone → Lname

Phone → Email

Phone → Gender

Phone → Age

Closure sets:

{UserAadharNo}+ = {UserAadharNo, Fname, Lname, Email, Phone, Gender, Age}

{Email}+ = {UserAadharNo, Fname, Lname, Email, Phone, Gender, Age}

{Phone}+ = {UserAadharNo, Fname, Lname, Email, Phone, Gender, Age}

Constraints:

a) Primary Key: UserAadharNo

b) Foreign Key: None

c) Referential: None

d) Candidate Key: {UserAadharNo, Email, Phone}

d) Domain:

UserAadharNo: BIGSERIAL PRIMARY KEY   
Fname: VARCHAR(10) NOT NULL,  
Lname: VARCHAR(10) NOT NULL,  
Email: VARCHAR(20) NOT NULL,  
Phone: Numeric(10) NOT NULL,  
IsActive: BOOLEAN DEFAULT TRUE,  
Gender: CHAR(1) CHECK (GENDER IN('M','F','O')),  
AGE: int

• Here, as we have {UserAadharNo, Email, Phone} as candidate key which defines all the attributes, so our relation is in BCNF Form.

2)

Table:

COPASSENGER **(UserAadharNo, CoPassID, Fname, Lname, Email, Phone, Gender, Age)**

Functional Dependencies:

{UserAadharNo, CoPassID} → Fname

{UserAadharNo, CoPassID} → Lname

{UserAadharNo, CoPassID} → Email

{UserAadharNo, CoPassID} → Phone

{UserAadharNo, CoPassID} → Gender

{UserAadharNo, CoPassID} → Age

Constraints:

a) Primary Key: (UserAadharNo, CoPassID)

b) Foreign Key: UserAadharNo

c) Referential: User Table

d) Candidate Key: {UserAadharNo, CoPassID}

e) Domain:

UserAadharNo: BIGSERIAL NOT NULL   
CoPassID: int NOT NULL  
Fname: VARCHAR(10) NOT NULL,  
Lname: VARCHAR(10) NOT NULL  
Email: VARCHAR(20)  
Phone: DECIMAL(12,0)  
Gender: CHAR(1) CHECK (GENDER IN('M','F','O'))  
AGE: int

• Here, as we have (UserAadharNo, CoPassID) as candidate key which defines all the attributes, so our relation is in BCNF Form.

3)

Table:

**Tourist\_spots** **(spotid, Name, season, ratings, address, pincode)**

Functional Dependencies:

spotid → Name

spotid → season

spotid → ratings

spotid → address

spotid → pincode

Closure sets:

{spotid} + = {Name, season, ratings, address, pincode}

Constraints:

a) Primary Key: spotid

b) Foreign Key: PINCODE

c) Referential: LOCATION

c) Candidate Key: spotid

d) Domain:

SPOTID: INT PRIMARY KEY GENERATED ALWAYS AS IDENTITY  
Name: VARCHAR (20) NOT NULL  
SEASON: VARCHAR (10)   
RATINGS: FLOAT CHECK (RATINGS>=0 AND RATINGS<=5)   
ADDRESS: VARCHAR (100)   
PINCODE: Numeric (6)

• Here, as we have spotid as candidate key which defines all the attributes, so our relation is in BCNF Form.

4)

Table:

**Guide** **(GuideAadharNo, fname, lname, email, phone, gender, age, address, pincode)**

Functional Dependencies:

GuideAadharNo→ fname

GuideAadharNo→ lname

GuideAadharNo→ email

GuideAadharNo→ phone

GuideAadharNo→ gender

GuideAadharNo→ age

GuideAadharNo→ address

GuideAadharNo→ pincode

email → GuideAadharNo

email → fname

email → lname

email → phone

email → gender

email → age

email → address

email → pincode

phone → GuideAadharNo

phone → fname

phone → lname

phone → email

phone → gender

phone → age

phone → address

phone → pincode

Closure sets:

{GuideAadharNo}+ = {GuideAadharNo, fname, lname, email, phone, gender, age, address, pincode}

{email}+ = {GuideAadharNo, fname, lname, email, phone, gender, age, address, pincode}

{Phone}+ = {GuideAadharNo, fname, lname, email, phone, gender, age, address, pincode}

Constraints:

e) Primary Key: GuideAadharNo

f) Foreign Key: PINCODE

g) Referential: LOCATION

d) Candidate Key: (GuideAadharNo, email, phone)

h) Domain:

GuideAadharNo: BIGSERIAL PRIMARY KEY   
Fname: VARCHAR(10) NOT NULL  
Lname: VARCHAR(10) NOT NULL  
Email: VARCHAR(20)  
Phone: Numeric(10) NOT NULL  
Gender: CHAR(1) CHECK (GENDER IN('M','F','O'))  
AGE: int  
ADDRESS: VARCHAR(100)  
PINCODE: Numeric(6)

• Here, as we have (GuideAadharNo, email, phone) as candidate key which defines all the attributes, so our relation is in BCNF Form.

5)

Table:

**Location (pincode, city, state)**

Functional Dependencies:

pincode → city

pincode → state

{pincode }+ = {pincode , city , state }

Constraints:

a) Primary Key: PINCODE

b) Foreign Key: None

c) Referential: None

d) Candidate Key: Pincode

e) Domain:

PINCODE Numeric (6) PRIMARY KEY  
CITY VARCHAR (30)

• Here, as we have Pincode as candidate key which defines all the attributes, so our relation is in BCNF Form.

6)

Table:

**Hotel (hotelid, Name, phone, foodtype, ratings, address, isactive, pincode)**

Functional Dependencies:

hotelid → Name

hotelid → phone

hotelid → foodtype

hotelid → ratings

hotelid → address

hotelid → isactive

hotelid → pincode

phone → hotelid

phone → Name

phone → foodtype

phone → ratings

phone → address

phone → isactive

phone → pincode

Closure Sets:

{hotelid }+ = {hotelid, Name, phone, foodtype, ratings, address, isactive, pincode}

{phone }+ = {hotelid, Name, phone, foodtype, ratings, address, isactive, pincode}

Constraints:

a) Primary Key: (hotelid)

b) Foreign Key: (PINCODE)

c) Referential: LOCATION

d) Candidate Key: (hotelid, phone)

d) Domain:

HOTELID: int PRIMARY KEY   
Name: VARCHAR(50) NOT NULL15)  
PHONE: Numeric(10)  
FOODTYPE: VARCHAR(20) CHECK (FOODTYPE IN('VEG','NON-VEG','BOTH'))  
RATINGS: float CHECK (RATINGS>=0 AND RATINGS<=5)  
ADDRESS: VARCHAR(100)  
IsActive: BOOLEAN DEFAULT TRUE  
PINCODE: Numeric(6)

• Here, as we have (hotelid, phone) as candidate key which defines all the attributes, so our relation is in BCNF Form.

7)

Table:

**Hotel\_services** **(hotelid, services)**

Functional Dependencies:

{hotelid, services} → hotelid

{hotelid, services} → services

Closure Sets:

{hotelid, services}+ = {hotelid, services}

Constraints:

a) Primary Key: (HOTELID, SERVICES)

b) Foreign Key: (HOTELID)

c) Referential: Hotel

d) Candidate Key: (hotelid, services)

e) Domain:

HOTELID: int NOT NULL   
SERVICES: VARCHAR (50) NOT NULL

• Here, as we have (hotelid, services) as candidate key which defines all the attributes, so our relation is in BCNF Form.

8)

Table:

**Room (hotelid, room\_no, Type, beds, capacity, rate, status)**

Functional Dependencies:

{hotelid, room\_no} → hotelid

{hotelid, room\_no} → room\_no

{hotelid, room\_no} → Type

{hotelid, room\_no} → beds

{hotelid, room\_no} → capacity

{hotelid, room\_no} → rate

{hotelid, room\_no} → status

Closure Sets:

{hotelid, room\_no}+ = {hotelid, room\_no, Type, beds, capacity, rate, status}

Constraints:

a) Primary Key: (hotelid, room\_no)

b) Foreign Key: (HOTELID)

c) Referential: HOTEL

d) Candidate Key: (hotelid, room\_no)

d) Domain:

HOTELID: int NOT NULL   
ROOM\_NO: DECIMAL(3,0) NOT NULL  
Type: VARCHAR(6) CHECK( "Type" IN('AC','NON-AC','HEATER'))  
BEDS: int CHECK(BEDS>0)  
CAPACITY: int CHECK(CAPACITY>0)  
RATE : FLOAT  
STATUS: VARCHAR(15) CHECK (STATUS IN('AVAILABLE','NOT-AVAILABLE','BOOKED'))

• Here, as we have (hotelid, room\_no) as candidate key which defines all the attributes, so our relation is in BCNF Form.

9)

Table:

**Room\_facilities (hotelid, roomno, facility)**

Functional Dependencies:

{hotelid, roomno, facility} → hotelid

{hotelid, roomno, facility} → roomno

{hotelid, roomno, facility} → facility

Closure Sets:

{hotelid, roomno, facility}+ = {hotelid, roomno, facility}

Constraints:

a) Primary Key: (hotelid, roomno, facility)

b) Foreign Key: (HOTELID, ROOM\_NO)

c) Referential: ROOM

d) Candidate Key: (hotelid, roomno, facility)

e) Domain:

HOTELID: int NOT NULL  
ROOM\_NO: int NOT NULL  
FACILITY: VARCHAR (50) NOT NULL

• Here, as we have (hotelid, roomno, facility) as candidate key which defines all the attributes, so our relation is in BCNF Form.

10)

Table:

**Restaurant** **(rid, Name, phone, foodtype, ratings, address, pincode)**

Functional Dependencies:

rid → Name

rid → phone

rid → foodtype

rid → ratings

rid → address

rid → pincode

phone → rid

phone → Name

phone → foodtype

phone → ratings

phone → address

phone → pincode

Closure Sets:

{rid}+ = {rid, Name, phone, foodtype, ratings, address, pincode}

{phone}+ = {rid, Name, phone, foodtype, ratings, address, pincode}

Constraints:

a) Primary Key: rid

b) Foreign Key: PINCODE

c) Referential: LOCATION

d) Candidate Key: (rid, phone)

d) Domain:

RID: INT PRIMARY KEY   
Name: VARCHAR(50) NOT NULL  
PHONE: Numeric(10)  
FOODTYPE: VARCHAR(20) CHECK (FOODTYPE IN('VEG','NON-VEG','BOTH')  
RATINGS: float CHECK (RATINGS>=0 AND RATINGS<=5)  
ADDRESS: VARCHAR(100)  
PINCODE: Numeric(6)

* Here, as we have (rid, phone) as candidate key which defines all the attributes, so our relation is in BCNF Form.

11)

Table:

**Restaurant\_cuisines (rid, cuisines)**

Functional Dependencies:

rid, cuisines → rid

rid, cuisines → cuisines

Closure Sets:

{rid, cuisines}+ = {rid, cuisines}

Constraints:

a) Primary Key: (rid, cuisines)

b) Foreign Key: rid

c) Referential: RESTAURANT

d) Candidate Key: (rid, cuisines)

e) Domain:

RID: int NOT NULL

CUISINES: VARCHAR(20)

• Here, as we have (rid, cuisines) as candidate key which defines all the attributes, so our relation is in BCNF Form.

12)

Table:

**Package** **(PackageID, Title, Duration, No\_Of\_people, Amount)**

Functional Dependencies:

PackageID → Title

PackageID → Duration

PackageID → No\_Of\_People

PackageID → Amount

Closure Sets:

{PackageID }+ = {Title, Duration , No\_Of\_People, Amount}

Constraints:

a) Primary Key: PackageID

b) Foreign Key: -

c) Referential: -

d) Candidate Key: PackageID

e) Domain:

PACKAGEID: INT PRIMARY KEY   
TITLE: VARCHAR (15) NOT NULL  
DURATION: INT  
NO\_OF\_PEOPLE: INT  
IsActive: BOOLEAN DEFAULT TRUE  
AMOUNT: float

• Here, as we have PackageID as candidate key which defines all the attributes, so our relation is in BCNF Form.

13)

Table:

**Package\_includes\_spots** **(packageid, spotid)**

Functional Dependencies:

packageid, spotid → packageid

packageid, spotid → spotid

Closure Sets:

{packageid, spotid }+ = {packageid, spotid}

Constraints:

a) Primary Key: (PACKAGEID, SPOTID)

b) Foreign Key: (PACKAGEID, SPOTID)

c) Referential: (PACKAGE, TOURIST\_SPOTS)

d) Candidate Key: (PACKAGEID, SPOTID)

d) Domain:

PACKAGEID: INT NOT NULL   
SPOTID: INT NOT NULL

• Here, as we have (PACKAGEID, SPOTID) as candidate key which defines all the attributes, so our relation is in BCNF Form.

14)

Table:

**Package\_includes\_guides** **(packageid, GuideAadharNo)**

Functional Dependencies:

{packageid, GuideAadharNo } → packageid

{packageid, GuideAadharNo } → GuideAadharNo

Closure Sets:

{packageid, GuideAadharNo }+ = {packageid, GuideAadharNo}

Constraints:

a) Primary Key: (PACKAGEID, GuideAadharNo)

b) Foreign Key: (PACKAGEID, GuideAadharNo)

c) Referential: Package, Guide

d) Candidate Key: (PACKAGEID, GuideAadharNo)

d) Domain:

PACKAGEID int NOT NULL   
GuideAadharNo BIGSERIAL NOT NULL

• Here, as we have (PACKAGEID, GuideAadharNo) as candidate key which defines all the attributes, so our relation is in BCNF Form.

15)

Table:

**Package\_includes\_hotels (packageid, hotelid, roomno)**

Functional Dependencies:

{packageid, hotelid, roomno} → packageid

{packageid, hotelid, roomno} → hotelid

{packageid, hotelid, roomno} → roomno

Closure Sets:

{packageid, hotelid, roomno}+ = {packageid, hotelid, roomno}

Constraints:

a) Primary Key: (packageid, hotelid, roomno)

b) Foreign Key: (HOTELID, ROOM\_NO)

c) Referential: ROOM

d) Candidate Key: (packageid, hotelid, roomno)

e) Domain:

PACKAGEID: int NOT NULL  
HOTELID: int NOT NULL  
ROOM\_NO: int NOT NULL

• Here, as we have (packageid, hotelid, roomno) as candidate key which defines all the attributes, so our relation is in BCNF Form.

16)

Table:

**Booking (BID, UserAdhar\_No, BookingDate, TripStartDate, TripEndDate, Amount)**

Functional Dependencies:

BID → UserAdhar\_No

BID → BookingDate

BID → TripStartDate

BID → TripEndDate

BID → Amount

Closure Sets:

{BID}+ = {BID, UserAdhar\_No, BookingDate, TripStartDate, TripEndDate, Amount}

Constraints:

a) Primary Key: {Bid}

b) Foreign Key: UserAdhar\_No

c) Candidate Key: {Bid}

d) Referential: User Table

e) Domain:

BID: Int UNIQUE,

UserAdhar\_No: BIGSERIAL NOT NULL,

BookingDate: TIMESTAMP DEFAULT CURRENT\_TIMESTAMP

TripStartDate: Date NOT NULL,

TripEndDate: Date NOT NULL,

Amount: FLOAT,

• Here, as we have {Bid} as candidate key which defines all the attributes, so our relation is also in BCNF Form.

17)

Table:

**Booking\_for\_package** **(BID, PackageID)**

Functional Dependencies:

BID → PackageID

Closure Sets:

{BID}+ = {BID, PackageID}

Constraints:

a) Primary Key: BID

b) Foreign Key: (BID, PACKAGEID)

c) Referential: BOOKING Table, PACKAGE Table,

d) Candidate Key: BID

e) Domain:

BID: INT Primary Key

PACKAGEID: INT NOT NULL

• Here, as we have BID as candidate key which defines all the attributes, so our relation is in BCNF Form.

18)

Table:

**Booking\_CoPassenger (BID, UserAadharNo, CoPassID)**

Functional Dependencies:

BID → UserAadharNo

BID → CoPassID

Closure Sets:

{BID}+ = {BID, UserAadharNo, CoPassID}

Constraints:

a) Primary Key: (BID)

b) Foreign Key: (BID, UserAadharNo, CoPassID)

c) Referential: Booking, COPASSENGER

d) Candidate Key: BID

e) Domain:

BID: int NOT NULL   
UserAadharNo: BIGSERIAL NOT NULL  
CoPassID: int NOT NULL

• Here, as we have BID as candidate key which defines all the attributes, so our relation is in BCNF Form.

19)

Table:

**Booking\_for\_hotel (bid, hotelid, roomno)**

Functional Dependencies:

{bid, hotelid, roomno} → bid

{bid, hotelid, roomno} → hotelid

{bid, hotelid, roomno} → roomno

Closure Sets:

{bid, hotelid, roomno}+ = {bid, hotelid, roomno}

Constraints:

a) Primary Key: (bid, hotelid, roomno)

b) Foreign Key: (BID, HOTELID, ROOM\_NO)

c) Referential: Booking, ROOM

d) Candidate Key: (bid, hotelid, roomno)

e) Domain:

BID: int NOT NULL  
HOTELID: int NOT NULL  
ROOM\_NO: int NOT NULL

• Here, as we have (bid, hotelid, roomno) as candidate key which defines all the attributes, so our relation is in BCNF Form.