





<u>Table</u>	<u>Candidate Key/s</u>
Bank	Account No
User	Mobile Number
Branch Details	IFSCcode
Card	Card_No
Rewards	[CompanyName,Transaction_ID]
Transaction History	Transaction_Id
Can Check	[Mobile_No,Transaction_ID]
Contact Details	[FriendMobileNo,UserMobileNo]
Bills	Bill_No
Service Provider	Service_ID,Service_No
User Service	Mobile_No,Service_ID
Services	Service_ID
Hotels	[HotelName,State,City,RoomType,Capacity]
Travel	[Source,Destination,TravelType,Class,TypeNo]
Donations	OrganizationName
OTT	[PlatformName, VideoQuality, AudioQuality, No.ofDevices, Validity(months)]
Mobile	[ProviderName, TotalData(gb) ,MsgLimit ,CallsLimit,TalkTime ,is(gb/day)?, Validity(days)]
Broadband	[ProviderName, Speed(mbps), Validity(months)]

Proof of BCNF Form

Bank

Candidate key \rightarrow Account No

Account No \rightarrow UPI_ID

Account No \rightarrow Balance

Account No \rightarrow AccountType

Account No \rightarrow Mobile_No

Account No \rightarrow IFSCcode

\Rightarrow As left side of all functional dependencies in the relation is a candidate key, this relation is in BCNF

User

Candidate key \rightarrow Mobile No

Mobile No \rightarrow FirstName

Mobile No \rightarrow LastName

Mobile No \rightarrow DOB

Mobile No \rightarrow Email

Mobile No \rightarrow PrimaryAccountNo

Mobile No \rightarrow UPI_ID

\Rightarrow As left side of all functional dependencies in the relation is a candidate key, this relation is in BCNF

Branch Detail

Candidate key \rightarrow IFSCcode

IFSCcode \rightarrow BankName

\Rightarrow As left side of all functional dependencies in the relation is a candidate key, this relation is in BCNF

Card

Candidate key \rightarrow Card_No

Card_No \rightarrow CardType

Card_No \rightarrow CardHolderName

Card_No \rightarrow ExpiryDate

Card_No \rightarrow CVV

Card_No \rightarrow Account_No

Card_No \rightarrow Mobile_No

\Rightarrow As left side of all functional dependencies in the relation is a candidate key, this relation is in BCNF

Rewards

Candidate key \rightarrow [CompanyName, Transaction_ID]

CompanyName, Transaction_ID \rightarrow Category

CompanyName, Transaction_ID \rightarrow Discount

CompanyName, Transaction_ID \rightarrow CashbackRange

CompanyName, Transaction_ID \rightarrow Validity

\Rightarrow As left side of all functional dependencies in the relation is a candidate key, this relation is in BCNF

Transaction History

Candidate key \rightarrow Transaction_ID

Transaction_ID \rightarrow TransactionAmount

Transaction_ID \rightarrow Sender_ID

Transaction_ID \rightarrow Receiver_ID

Transaction_ID \rightarrow PaymentStatus

Transaction_ID \rightarrow Date

Transaction_ID \rightarrow Time

\Rightarrow As left side of all functional dependencies in the relation is a candidate key, this relation is in BCNF

Can Check

Candidate key \rightarrow Mobile_No, Transaction_ID

Mobile_No \rightarrow Transaction_ID

Transaction_ID \rightarrow Mobile_No

\Rightarrow As left side of all functional dependencies in the relation is a candidate key, this relation is in BCNF

Contact Details

Candidate key \rightarrow [FriendMobileNo, UserMobileNo]
[FriendMobileNo, UserMobileNo] \rightarrow FriendName

- \Rightarrow As left side of all functional dependencies in the relation is a candidate key, this relation is in BCNF

Bills

Candidate key \rightarrow Bill_No
Bill_No \rightarrow BillDate
Bill_No \rightarrow DueDate
Bill_No \rightarrow Service_No
Bill_No \rightarrow BillAmount

- \Rightarrow As left side of all functional dependencies in the relation is a candidate key, this relation is in BCNF

Service Provider

Candidate key \rightarrow Service_ID, Service_No

Service_ID \rightarrow ServiceType
Service_ID \rightarrow Service_No
Service_No \rightarrow Service_ID
Service_No \rightarrow ServiceType
Service_ID \rightarrow ProviderName
Service_No \rightarrow ProviderName
Service_ID \rightarrow City
Service_No \rightarrow City
Service_ID \rightarrow State
Service_No \rightarrow State

- \Rightarrow As left side of all functional dependencies in the relation is a candidate key, this relation is in BCNF

User Service

Candidate key \rightarrow Mobile_No, Service_ID

Mobile_No \rightarrow Service_ID
Service_ID \rightarrow Mobile_No

- \Rightarrow As left side of all functional dependencies in the relation is a candidate key, this relation is in BCNF

Services

Candidate key \rightarrow Service_ID

Service_ID \rightarrow ServiceName

Service_ID \rightarrow ServiceType

- \Rightarrow As left side of all functional dependencies in the relation is a candidate key, this relation is in BCNF

Hotels

Candidate key \rightarrow [HotelName, State, City, RoomType, Capacity]

HotelName, State, City, RoomType, Capacity \rightarrow Stars

HotelName, State, City, RoomType, Capacity \rightarrow UserRating

HotelName, State, City, RoomType, Capacity \rightarrow PricePerNight

HotelName, State, City, RoomType, Capacity \rightarrow User_ServiceID

- \Rightarrow As left side of all functional dependencies in the relation is a candidate key, this relation is in BCNF

Travel

Candidate key \rightarrow [Source, Destination, TravelType, Class, TypeNo]

[Source, Destination, TravelType, Class, TypeNo] \rightarrow Name

[Source, Destination, TravelType, Class, TypeNo] \rightarrow Price

[Source, Destination, TravelType, Class, TypeNo] \rightarrow User_ServiceID

- \Rightarrow As left side of all functional dependencies in the relation is a candidate key, this relation is in BCNF

Donations

Candidate key \rightarrow OrganizationName

OrganizationName \rightarrow OrganizationType

OrganizationName \rightarrow MinAmount

OrganizationName \rightarrow MaxAmount

OrganizationName \rightarrow User_ServiceID

- \Rightarrow As left side of all functional dependencies in the relation is a candidate key, this relation is in BCNF

OTT

Candidate key \rightarrow [PlatformName, VideoQuality, AudioQuality, No.ofDevices, Validity(months)]

[PlatformName, VideoQuality, AudioQuality, No.ofDevices, Validity(months)] \rightarrow Amount

[PlatformName, VideoQuality, AudioQuality, No.ofDevices, Validity(months)] \rightarrow User_ServiceID

⇒ As left side of all functional dependencies in the relation is a candidate key, this relation is in BCNF

Mobile

Candidate key → [ProviderName, TotalData(gb), MsgLimit, CallsLimit, TalkTime, is(gb/day)?, Validity(days)]

[ProviderName, TotalData(gb), MsgLimit, CallsLimit, TalkTime, is(gb/day)?, Validity(days)] → Amount

ProviderName, TotalData(gb), MsgLimit, CallsLimit, TalkTime, is(gb/day)?, Validity(days)] → User_ServiceID

⇒ As left side of all functional dependencies in the relation is a candidate key, this relation is in BCNF

Broadband

Candidate key → [ProviderName, Speed(mbps), Validity(months)]

[ProviderName, Speed(mbps), Validity(months)] → Amount

[ProviderName, Speed(mbps), Validity(months)] → User_ServiceID

⇒ As left side of all functional dependencies in the relation is a candidate key, this relation is in BCNF

Conclusion

All our relations are in BCNF

Therefore our complete schema is in BCNF