DATABASE MANAGEMENT SYSTEM

(IT-214)

Lab Group 6

Group No. 14

Car Bazaar

[Github]

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FDs and BCNF proof for different relations :

1) *Company* :
   - CompanyId→CompanyName
   - CompanyId→Country
   - CompanyId→Global_ rank

   Key: CompanyId

   About BCNF:

   So from the Projected FD set it can be seen that for every non-Trivial FD, the LHS of the Functional Dependency is the SuperKey of the Relation i.e.CompanyID. So this relation is in BCNF.

2) *Car*:
   - CarID → Car_Name
   - CarID → Car_Type
   - CarID → Model
   - CarID → CompanyID
   - CarID → Year
   - CarID → Transmission_Type
   - CarID → Seating_Capacity
   - CarID → Fuel_Capacity
   - CarID → Colour
   - CarID → Fuel_Type
   - CarID → Safety_Rating
   - CarID → Max_Speed
   - CarID → Mileage
   - CarID → Air_Bags
   - CarID → Sunroof

   Key: CarID

About BCNF:

So from the Projected FD set it can be seen that for every non-Trivial FD, the LHS of the Functional Dependency is the SuperKey of the Relation i.e.CarID. So this relation is in BCNF.

3) *AvailableCars*:

- MID→carID

Key: MID

About BCNF:

So from the Projected FD set it can be seen that for every non-Trivial FD, the LHS of the Functional Dependency is the SuperKey of the Relation i.e.MID. So this relation is in BCNF.

4) *New_Car*:

- MID→Nprice
- MID→SellerID
- MID→IsSold

Key: MID

About BCNF:

Here also, MID is the Superkey and all other attributes can be determined by the Superkey i.e.MID, So this Relation also satisfies BCNF.

5) *OldCar*:

- MID → SellerID
- MID → OPrice
- MID → KM_Driven
- MID → Time_Used
- MID → StateCode

- MID → RTOCode
- MID → SeriesCode
- MID → VehicleNumber
- MID → IsSold

Key: MID

About BCNF:

Here also, MID is the Superkey and all other attributes can be determined by the Superkey i.e.MID, So this Relation also satisfies BCNF.

6) *Market*:

- ItemID → IsCar

Key: ItemID

About BCNF:

So ItemID being Superkey it determines all other attributes of the relation and also there is no other Attribute which alone can determine any other Attribute. So this relation also satisfies BCNF.

7) *Accessory*:

- AID → SellerID
- AID → ADetailID
- AID → Price
- AID → InStock

Key: AID

About BCNF:

So using only AID we can determine other attributes and also AID is the Superkey, So this table also satisfies BCNF.

8) *Seller*:

- SellerID → Password
- SellerID → Seller_FName
- SellerID → Seller_LName
- SellerID → Gender
- SellerID → Seller_type
- SellerID → E-mail
- SellerID → Seller_Rating
- SellerID → District
- SellerID → City
- SellerID → State

Key: SellerID

About BCNF:

So from the Projected FD set it can be seen that for every non-Trivial FD, the LHS of the Functional Dependency is the SuperKey of the Relation i.e.SellerID. So this relation is in BCNF.

9) *SellerContact*:

{SellerId,ContactNo} is the Composite Key. Requirement of this relation is because, Seller can have 2 or more Contact numbers.

There are only 2 Trivial FDs:

- {SellerId,ContactNo} → SellerID
- {SellerId,ContactNo} → ContactNo

Key: {SellerId,ContactNo}

About BCNF:

There is no Non-Trivial FD, so this Relation is by default BCNF.

10) *User*:

- UserID → Password
- UserID → User_FName
- UserID → User_LName
- UserID → Gender
- UserID → Contact_No
- UserID → E-mail
- UserID → District
- UserID → City
- UserID → State

Key: UserID

About BCNF:

So from the Projected FD set it can be seen that for every non-Trivial FD, the LHS of the Functional Dependency is the SuperKey of the Relation i.e.UserID. So this relation is in BCNF.

11) *AccessoriesDetail*:

- ADetailID→ AName
- ADetailID→ Material
- ADetailID→ Manufacturer
- ADetailID→ Description

Key: ADetailsID

About BCNF:

Here ADetailID is the SuperKey, so we can determine all other attributes using it, and for any other attribute, none of them can alone determine any other attribute, So this Relation satisfies BCNF.

12) *Order*:

- OrderID→ItemId
- OrderID→UserId

- OrderID→Quantity
- OrderID→Date
- OrderID→Payment_type

Key: OrderID

About BCNF:

Here OrderID is the SuperKey, so we can determine all other attributes using it, and for any other attribute, none of them can alone determine any other attribute, So this relation satisfies BCNF.

13) *Service*:

- {MID,StartDate} → ServiceProviderID
- {MID,StartDate} →UserID
- {MID,StartDate} → End_Date
- {MID,StartDate} → Status
- {MID,StartDate} → Charges

Key:{MID,StartDate}

About BCNF:

All non-trivial FDs have a superkey{MID,StartDate} as their determinant, so this Relation also Satisfies all the BCNF Constraint, hence it is in BCNF.

14) *WishList*:

- {UserID, ItemID} → Date_Added

Key: {UserID,ItemID}

About BCNF:

There is only one non-trivial FD, and for that FD the determinant is the SuperKey itself, hence this relation is also in BCNF.

15) Review:

Here we have assumed that a user can give review to only the items he has bought and once he gives a review and wants to again give review, then his old Review will be updated.

- {ItemID,UserID} → Date
- {ItemID,UserID} → Rating
- {ItemID,UserID} → Comments

Key: {ItemID,UserID}

About BCNF:

All non-trivial FDs have a superkey{ItemID,UserID} as their determinant, so this Relation also Satisfies all the BCNF Constraint, hence it is in BCNF.

Minimal FD Set:

CompanyID → companyName
CompanyID → country
CompanyID → Global_rank

CarID → Car_Name
CarID → Car_Type
CarID → Model
CarID → CompanyID
CarID → Year
CarID → Transmission_Type
CarID → Seating_Capacity
CarID → Fuel_Capacity
CarID → Colour
CarID → Fuel_Type
CarID → Safety_Rating
CarID → Max_Speed
CarID → Mileage
CarID → Air_Bags
CarID → Sunroof

MID → carID

MID → Nprice

MID → SellerID
MID → IsSold
MID → OPrice
MID → KM_Driven
MID → Time_Used
MID → StateCode
MID → RTOCode
MID → SeriesCode
MID → VehicleNumber

ItemID → IsCar

ADetailID → AName
ADetailID → Material
ADetailID → Manufacturer
ADetailID → Description

AID → SellerID
AID → ADetailID
AID → Price
AID → InStock

SellerID → Password
SellerID → seller_FName
SellerID → seller_LName
SellerID → Gender
SellerID → seller_type
SellerID → E-mail
SellerID → seller_Rating
SellerID → District
SellerID → City
SellerID → State

UserID → Password
UserID → User_FName
UserID → User_LName
UserID → Gender
UserID → Contact_No
UserID → E-mail
UserID → District
UserID → City
UserID → State

OrderID → ItemID
OrderID → UserID
OrderID → Quantity
OrderID → Date
OrderID → Payment_type

{MID,StartDate}→ ServiceProviderID
{MID,StartDate} → UserID
{MID,StartDate}→ End_Date
{MID,StartDate} → Status
{MID,StartDate} → Charges

{UserID, ItemID} → Date_Added

{ItemID,UserID} → Comments
{ItemID,UserID} → Date
{ItemID,UserID} → Rating