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Restaurant-Franchise Management System

Normalization & Schema Refinement

Normal Forms:-

- 1) BCNF:-** First check the left side of all the FDs if they are one of the candidate keys then it is in BCNF form .
- 2) 3NF:-** If the BCNF condition fails, then for all FDs which violate the BCNF condition , check if the right side attribute is a key attribute or not. If it is a key attribute then it is in 3NF form.
- 3) 2NF:-** If the 3NF condition fails then check for all those FDs which violate the 3NF condition , check if their right hand side is completely dependent on the key or not. If it is completely dependent on the key then it is in 2NF form.
- 4) 1NF:-** If the 2NF condition fails then ensuring that all the attributes of the table are atomic will make it in 1NF form.

1) Employee:-

Functional Dependencies:-

EID→ branch_license_no

EID→First_name

EID→Middle_name
EID→Last_name
EID→Gender
EID→Monthly_salary
EID→Contact_no
EID→Aadhar_no
EID→City
EID→Locality
EID→PIN_code
EID→Job_position
EID→Joining_date
EID→company-employee
EID→work-status
EID→overall-performance
EID→promotion-eligibility

Aadhar_no→branch_license_no
Aadhar_no→First_name
Aadhar_no→Middle_name
Aadhar_no→Last_name
Aadhar_no→Gender
Aadhar_no→Monthly_salary
Aadhar_no→Contact_no
Aadhar_no→Aadhar_no
Aadhar_no→City
Aadhar_no→Locality
Aadhar_no→PIN_code
Aadhar_no→Job_position
Aadhar_no→Joining_date
Aadhar_no→company-employee
Aadhar_no→work-status
Aadhar_no→overall-performance
Aadhar_no→promotion-eligibility

Aadhar_no and EID are candidate keys

EID is a key as it determines all the attributes.

Relation is in BCNF form as all left side attributes of all FDs are key.

2) Branch:-

Functional Dependencies:-

Trading_license_no \rightarrow Rating

Trading_license_no \rightarrow Locality

Trading_license_no \rightarrow PIN_code

Trading_license_no \rightarrow City

Trading_license_no \rightarrow Region

Trading_license_no is key.

Relation is in BCNF form as all left side attributes of all FDs is a key.

3) Dependents:-

Functional Dependencies:-

{EID, First_name, last_name} \rightarrow Middle_name

{EID, First_name, last_name} \rightarrow gender

{EID, First_name, last_name} \rightarrow Relationship

{EID, First_name, last_name} is key.

Relation is in BCNF form as all left side attributes of all FDs is a key.

4) Company-owned branch:-

Functional Dependencies:-

trading_license_no → Revenue generated monthly

trading_license_no is key.

Relation is in BCNF form as all left side attributes of all FDs is a key

5) Advertisement:-

Functional Dependencies:-

Advertisement_code → branch_no

Advertisement_code → service_provider

Advertisement_code → Mode_of_Ad

Advertisement_code → monthly_charge

Advertisement_code is key.

Relation is in BCNF form as all left side attributes of all FDs is a key.

6) Branch Statistics:-

Functional Dependencies:-

{Trading_license_no, Year} → Most_selling_dish

{Trading_license_no, Year} → Expenditure_on_tax

{Trading_license_no, Year} is key.

Relation is in BCNF form as all left side attributes of all FDs is a key.

7) Supplier:-

Functional Dependencies:-

{supplier_name, supplier_locality, supplier_city} → office_pin_code

{supplier_name, supplier_locality, supplier_city} → Contact No

{supplier_name, supplier_locality, supplier_city} is key.

Relation is in BCNF form as all left side attributes of all FDs is a key.

8) Supplies:-

No functional dependencies are present in this table, the two attributes combinedly are forming the primary key, none of the two attributes is determining the other, so both are compulsory attributes.

{supplier_name, Supplier_locality, Supplier_city, raw_material_name} is the key.

Relation is in BCNF form as there are no FDs.

9) Supplied To:-

Functional Dependencies:-

{Branch No, supplier_name, Supplier_locality, Supplier_city, raw_material_name} → quantity bought

{Branch No, supplier_name, Supplier_locality, Supplier_city, raw_material_name} is the key.

Relation is in BCNF form as all left side attributes of all FDs is a key.

10) Raw Materials:-

Functional Dependencies:-

Material Name \rightarrow Material Type

Material Name is a key.

This table has only 2 attributes so it is in BCNF form.

11) Franchisee Company:-

Functional Dependencies:-

cin \rightarrow company_name ,

cin \rightarrow head_manager ,

cin \rightarrow head_office_locality ,

cin \rightarrow head_office_pin_code ,

cin \rightarrow head_office_city

Cin is a key.

Relation is in BCNF form as all left side attributes of all FDs is a key.

12) Franchisee-owned branch:-

Functional Dependencies:-

Trading_license_no \rightarrow cin

Trading_license_no \rightarrow royalty_fees

Trading_license_no is a key.

Relation is in BCNF form as all left side attributes of all FDs is a key.

13) Dish

Functional Dependencies:-

dish_name \rightarrow price

dish_name \rightarrow veg_or_nonveg

dish_name \rightarrow description

dish_name \rightarrow signature dish

dish_name \rightarrow speciality varchar(15),

dish_name \rightarrow region varchar(12),

dish_name is a key.

Relation is in BCNF form as all left side attributes of all FDs is a key.

14) Branch Servings

Attributes present are:- Branch_no, Dish Name

There are no FDs present in this table.

{Branch_no, Dish Name} is a key.

So the table is in BCNF form.

15) Contact details

There are two attributes present :- Office CIN , Contact Number

No FDs are present in this table.

{Office CIN , Contact Number} is a key

So this table is in BCNF form as there are no FDs present.

Conclusion

No change is required in any of the tables as they are already in BCNF form as mentioned above.

Reason:

All tables were already in BCNF forms ,So no changes were required in DDL.