**FUNCTIONAL DEPENDENCIES AND NORMALIZATION**

**NOTE :** Below mentioned dependencies are not the only functional dependencies possible i.e by considering Reflexivity rule X→X dependency is possible and by using Decomposition Rule (if X→YZ then X→Y and X→Z) several other dependencies are possible for each table

**RESTAURANT :**

(Restaurant\_id) → (Name, Phone\_no, Address, PIN, Opening\_time, Closing\_time)

(Phone\_no) → (Name, Restaurant\_id, Address, PIN, Opening\_time, Closing\_time)

(Address, PIN) → (Name, Phone, Opening\_time, Closing\_time)

* Candidate keys are Restaurant\_id , Phone\_no , (Address, PIN)
* Primary key is Restaurant\_id
* All the non-prime attributes completely depend on candidate keys .Hence the relation is in 2NF.
* All the non-prime attributes are not transitively dependent on any key of the table. Hence the relation is in 3NF.
* All the determinants are candidate keys.Hence the table is in BCNF .

**RESTAURANT\_CUISINES :**

(Restaurant\_id,Cuisines) → (Restaurant\_id,Cuisines)

* Primary key is (Restaurant\_id,Cuisines)
* Since there are no non-prime attributes , table will be in 3NF .
* All the determinants are candidate keys.Hence the table is in BCNF.

**RESTAURANT\_RATING :**

(Customer\_id, Time\_stamp) → (Restaurant\_id, Order\_number, Rating, Review)

(Order\_number) → (Restaurant\_id, Customer\_id, Time\_stamp, Rating, Review)

* Candidate keys are (Customer\_id, Time\_stamp) , Order\_number
* Primary key is Order\_number
* All the non-prime attributes are completely dependent on candidate keys .Hence the relation is in 2NF.
* All the non-prime attributes are not transitively dependent on any key of the table. Hence the relation is in 3NF.
* All the determinants are candidate keys.Hence the table is in BCNF .

**CUSTOMERS :**

(Customer\_id) → (Username, Email\_id, Password, Phone\_no)

(Email\_id) → (Username, Customer\_id, Password, Phone\_no)

(Phone\_no) → (Username, Email\_id, Password, Customer\_id)

* Candidate key are Customer\_id , Phone\_no , Email\_id
* Primary key is Customer\_id
* All the non-prime attributes completely depend on candidate keys .Hence the relation is in 2NF.
* All the non-prime attributes are not transitively dependent on any key of the table. Hence the relation is in 3NF.
* All the determinants are candidate keys.Hence the table is in BCNF .

**DELIVERY\_BOY :**

(Delivery\_boy\_id) → (First\_Name,Last\_Name, Salary, Bike\_no, Email\_id)

(Bike\_no) → (First\_Name,Last\_Name, Salary, Delivery\_boy\_id, Email\_id)

(Email\_id) → (First\_Name,Last\_Name, Salary, Bike\_no, Delivery\_boy\_id)

* Candidate key are Delivery\_boy\_id , Bike\_no , Email\_id
* Primary key is Delivery\_boy\_id
* All the non-prime attributes completely depend on candidate keys .Hence the relation is in 2NF.
* All the non-prime attributes are not transitively dependent on any key of the table. Hence the relation is in 3NF.
* All the determinants are candidate keys.Hence the table is in BCNF .

**DELIVERY\_BOY\_RATING :**

(Order\_number) → (Time\_stamp, Delivery\_boy\_id, Rating, Review)

* Primary key is Order\_number
* All the non-prime attributes completely depend on candidate keys .Hence the relation is in 2NF.
* All the non-prime attributes are not transitively dependent on any key of the table. Hence the relation is in 3NF.
* All the determinants are candidate keys.Hence the table is in BCNF .

**DELIVERY\_BOY\_PHONE :**

(Deliver\_boy\_id,Phone\_no)→ (Deliver\_boy\_id,Phone\_no)

* Primary key is (Deliver\_boy\_id,Phone\_no)
* Since there are no non-prime attributes , table will be in 3NF .
* All the determinants are candidate keys.Hence the table is in BCNF .

**COUPONS :**

(Promo\_Code) → (Offer\_percentage, Minimum\_Order, Max\_Discount, Details)

* Primary key is Promo\_Code
* All the non-prime attributes completely depend on candidate keys .Hence the relation is in 2NF.
* All the non-prime attributes are not transitively dependent on any key of the table. Hence the relation is in 3NF.
* All the determinants are candidate keys.Hence the table is in BCNF .

**ITEMS :**

(Dish\_name) → (Type,Section)

* Primary key is Dish\_name
* All the non-prime attributes completely depend on candidate keys .Hence the relation is in 2NF.
* All the non-prime attributes are not transitively dependent on any key of the table. Hence the relation is in 3NF.
* All the determinants are candidate keys.Hence the table is in BCNF .

**ORDERS :**

(Order\_number) → ( Restaurant\_id, Customer\_id, Delivery\_boy\_id, Delivery\_Charge , Tax, Promo\_Code, Payment\_name, Transaction\_id, Total, Description, Address, Pin )

* Primary key is Order Number
* All the non-prime attributes completely depend on candidate keys .Hence the relation is in 2NF.
* All the non-prime attributes are not transitively dependent on any key of the table. Hence the relation is in 3NF.
* All the determinants are candidate keys.Hence the table is in BCNF .

**LOCATION :**

(Pin) → (Locality , City , State)

* Primary key is Pin
* All the non-prime attributes completely depend on candidate keys .Hence the relation is in 2NF.
* All the non-prime attributes are not transitively dependent on any key of the table. Hence the relation is in 3NF.
* All the determinants are candidate keys.Hence the table is in BCNF .

**ORDERED\_ITEMS :**

(Order\_number, Dish\_name) → (Quantity)

* Primary key is (Order\_number, Dish\_name)
* All the non-prime attributes completely depend on candidate keys .Hence the relation is in 2NF.
* All the non-prime attributes are not transitively dependent on any key of the table. Hence the relation is in 3NF.
* All the determinants are candidate keys.Hence the table is in BCNF .

**ITEMS\_RATING :**

(Order\_number, Dish\_name) → (Time\_stamp, Rating, Review)

* Primary key is (Order\_number, Dish\_name)
* All the non-prime attributes completely depend on candidate keys .Hence the relation is in 2NF.
* All the non-prime attributes are not transitively dependent on any key of the table. Hence the relation is in 3NF.
* All the determinants are candidate keys.Hence the table is in BCNF .

**MENU :**

(Restaurant\_id, Dish\_name) → (Cost , Available)

* Primary key is (Restaurant\_id, Dish\_name)
* All the non-prime attributes completely depend on candidate keys .Hence the relation is in 2NF.
* All the non-prime attributes are not transitively dependent on any key of the table. Hence the relation is in 3NF.
* All the determinants are candidate keys.Hence the table is in BCNF.

**OFFERS\_AVAILABLE :**

(Restaurant\_id, Promo\_Code) → (Restaurant\_id, Promo\_Code)

* Since there are no non-prime attributes , table will be in 3NF .
* All the determinants are candidate keys.Hence the table is in BCNF .

**PAYMENT METHODS :**

(Name) → (Type)

* Primary key is Name
* All the non-prime attributes completely depend on candidate keys .Hence the relation is in 2NF.
* All the non-prime attributes are not transitively dependent on any key of the table. Hence the relation is in 3NF.
* All the determinants are candidate keys.Hence the table is in BCNF .

**HAS :**

(Customer\_id,Payment\_name) → (Customer\_id,Payment\_name)

* Since there are no non-prime attributes , table will be in 3NF .
* All the determinants are candidate keys.Hence the table is in BCNF .

**ORDER\_STATUS :**

(Order\_number,Time\_stamp) → (Order\_number,Time\_stamp)

* Primary key is (Order\_number,Time\_stamp)
* Since there are no non-prime attributes , table will be in 3NF .
* All the determinants are candidate keys.Hence the table is in BCNF .