Gada Electronics Database

Minimal FD Set for each relation

1. **Admin(Admin_id,Name,Password):**

   Fmin = {Admin_id -> (Name, Password)}

2. **Employee(Employee_id, E_name, E_gender, E_salary, Branch_id)**

   Fmin = {Employee_id -> (E_name,E_gender, E_salary, Branch_id)}

3. **Branch(Branch_id, Address, Admin_id)**

   Fmin = {Branch_id -> (Address, Admin_id)}

4. **Items(Item_code, Item_name, Brand_name, GSP, MRP, Cost_price, Warranty, Rating)**

   Fmin = {Item_code -> (Item_name, Brand_name, GSP, MRP, Cost_price, Warranty, Rating)}

5. **Features(Item_code, Feature)**

   No FDs
   So Fmin is empty.

6. **Sells(Item_code, Branch_id, Qty_instock)**

   Fmin = {(Item_code, Branch_id) -> (Qty_instock)}

7. **Order_details(Invoice_no, Item_code, Qty, Rate, Branch_id)**

   Fmin = {(Invoice_no, Item_code) -> (Qty, Rate, Branch_id)}

8. **Orders(Invoice_no, Invdate, Status, Payment_date, Payment_method, Total_amount, Customer_id)**

Fmin = {Invoice_no -> (Invdate, Status, Payment_date, Payment_method, Total_amount, Customer_id)}

9. **Complaint(Complaint_id, Invoice_no, Complaint_date)**

Fmin = {Complaint_id -> (Invoice_no, Complaint_date)}

10. **Complaint_details(Complaint_id, Complaint_details)**

No FDs
So Fmin is empty.

11. **Customer(Customer_id, Password, Name, Address, Birth_date, Gender)**

Fmin = { Customer_id -> (Password, Name, Address, Birth_date, Gender)}

12. **Customer_mobile(Customer_id, Mobile_no)**

No FDs
So Fmin is empty.

13. **Customer_email(Customer_id, Email_id)**

No FDs
So Fmin is empty.

Proof that relations are in BCNF

A relation R is in BCNF if,
For every FD A → B that holds on relation R, A is its super-key.

This requirement is true for every relation of our Gada Electronics database. So all relations are in BCNF.

In case of Features, Complaint_details, Customer_mobile, Customer_email Relations.

These are all attribute Key Relations. That is why in BCNF.

Consider an Employee relation.

F = {Employee_id -> (E_name,E_gender, E_salary, Branch_id)}

Here,
closure of Employee_id = {Employee_id, E_name,E_gender, E_salary, Branch_id}

It contains all Attributes of Employee relation. So, Employee_id is a key.

It satisfies the requirement of BCNF => Employee is in BCNF.

Similarly for other relations.

So, all the relations are in BCNF.