**Gada Electronics Database**

**Minimal FD Set for each relation**

1. **Admin(Admin\_id,Name,Password):**

Fmin = {Admin\_id -> (Name, Password)}

1. **Employee(Employee\_id, E\_name, E\_gender, E\_salary, Branch\_id)**

Fmin = {Employee\_id -> (E\_name,E\_gender, E\_salary, Branch\_id)}

1. **Branch(Branch\_id, Address, Admin\_id)**

Fmin = {Branch\_id -> (Address, Admin\_id)}

1. **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)}

1. **Features(Item\_code, Feature)**

No FDs

So Fmin is empty.

1. **Sells(Item\_code, Branch\_id, Qty\_instock)**

Fmin = {(Item\_code, Branch\_id) -> (Qty\_instock)}

1. **Order\_details(Invoice\_no, Item\_code, Qty, Rate, Branch\_id)**

Fmin = {(Invoice\_no, Item\_code) -> (Qty, Rate, Branch\_id)}

1. **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)}

1. **Complaint(Complaint\_id, Invoice\_no, Complaint\_date)**

Fmin = {Complaint\_id -> (Invoice\_no, Complaint\_date)}

1. **Complaint\_details(Complaint\_id, Complaint\_details)**

No FDs

So Fmin is empty.

1. **Customer(Customer\_id, Password, Name, Address, Birth\_date, Gender)**

Fmin = { Customer\_id -> (Password, Name, Address, Birth\_date, Gender)}

1. **Customer\_mobile(Customer\_id, Mobile\_no)**

No FDs

So Fmin is empty.

1. **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.**