IT-214 Group G2-T9

Beauty Salon Database Management System
Relational Schema + ER Dia. + Normalization Proofs

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MINIMAL FD SET

Customer	
Customer_ID	C_Name
Customer_ID	DOB
Customer_ID	Gender
Customer_ID	C_PIN
Customer_ID	C_Street
Customer_ID	C_City
Customer_ID	C_Email
Customer_ID	C_PhoneNo

Premium Customers	
{Customer_ID, M_name}	Membership_Validity

Membership	
M_name	Duration
M_name	M_Price
M_name	Discount_rate

Staff	
Staff_ID	S_name
Staff_ID	Availability
Staff_ID	Rating
Staff_ID	S_Salary
Staff_ID	Date_of_Joining
Staff_ID	S_Email
Staff_ID	S_PhoneNo
Staff_ID	SupervisorID
Staff_ID	Branch_ID

Product	
ProductID	P_name
ProductID	SellingPrice

ProductID	Stock
ProductID	BrandName
ProductID	Supplier_ID

Supplier	
Supplier_ID	Supp_Name
Supplier_ID	Supp_Email
Supplier_ID	Supp_PhoneNo

Service	
Service_ID	Ser_Price
Service_ID	Ser_Name
Service_ID	Category

Administrator	
A_ID	A_Name
A_ID	A_Email
A_ID	A_PhoneNo
A_ID	A_Salary
A_ID	A_Role
A_ID	Branch_ID

Branch

Branch_ID	B_Name
Branch_ID	B_Street
Branch_ID	B_City
Branch_ID	B_PIN

Used_At	
{ProductID, Branch_ID}	Used_Quantity

Supply	
{ProductID, Supplier_ID, Supplied_Date}	Supplied_Quantity
{ProductID, Supplier_ID, Supplied_Date}	Supplied_Rate

Books_Appointment	
{Customer_ID, Service_ID, Appointment_date, Branch_ID}	Bill_ID
{Customer_ID, Service_ID, Appointment_date, Branch_ID}	Appointment_Time

Purchase	
{Customer_ID, ProductID, Purchase_Date, Branch_ID}	Bill_ID
{Customer_ID, ProductID, Purchase_Date, Branch_ID}	Purchase_Quantity

Bill	
Bill_ID	Amount
Bill_ID	Discount
Bill_ID	Payable_amount
Bill_ID	Payment_mode

BCNF PROOF

- **Customer (Customer_ID, C_Name, DOB, Gender, C_PIN, C_Street, C_Email, C_PhoneNo)**
    - Customer_ID —-> {C_Name, DOB, Gender, C_PIN, C_Street, C_Email, C_PhoneNo}
    - Candidate Key - Customer_ID

    All FDs have left side = superkey. Hence, in BCNF

- **Premium Customers(Customer_ID, M_name, Membership_Validity)**
    - {Customer_ID, M_name} —-> {Membership_Validity}
    - Candidate Key - {Customer_ID, M_name}

    All FDs have left side = superkey. Hence, in BCNF

- **Membership (M_name, Duration, M_Price, Discount_rate)**

    - M_name—-> { Duration, M_Price, Discount_rate}

- ○ Candidate Key **-** M_name

  All FDs have left side = superkey. Hence, in BCNF

- **Staff (Staff_ID, S_name, Availability, Rating, S_Salary, Date_of_Joining, S_Email, S_PhoneNo, SupervisorID,BranchID)**

  - ○ Staff_ID—-> { S_name, Availability, Rating, S_Salary, Date_of_Joining, S_Email, S_PhoneNo, SupervisorID,BranchID}

  - ○ Candidate Key **-** Staff_ID

  All FDs have left side = superkey. Hence, in BCNF

- **Product (ProductID, P_name, SellingPrice, Stock, BrandName, Supplier_ID)**

  - ○ Product_ID —-> { P_name, SellingPrice, Stock, BrandName, Supplier_ID}

  - ○ Candidate Key **-** ProductID

  All FDs have left side = superkey. Hence, in BCNF

- **Supplier (Supplier_ID,Supp_Name, Supp_Email, Supp_PhoneNo)**

  - ○ Supplier_ID—-> {Supp_Name, Supp_Email, Supp_PhoneNo}

  - ○ Candidate Key **-** Supplier_ID

  All FDs have left side = superkey. Hence, in BCNF

- **Service (Service_ID, Ser_Price, Ser_Name,Category)**

  - ○ Service_ID —-> {Ser_Price, Ser_Name,Category}

  - ○ Candidate Key **-** Service_ID

  All FDs have left side = superkey. Hence, in BCNF

- **Administrator (A_ID, A_Name, A_Email, A_PhoneNo, A_Salary, A_Role, Branch_ID)**

    - A_ID —-> {A_Name, A_Email, A_PhoneNo, A_Salary, A_Role, Branch_ID}

    - Candidate Key - A_ID

        All FDs have left side = superkey. Hence, in BCNF

- **Branch (Branch_ID, B_Name, B_Street, B_City, B_PIN)**

    - Branch_ID—-> { B_Name, B_Street, B_City, B_PIN}

    - Candidate Key - Branch_ID

        All FDs have left side = superkey. Hence, in BCNF

- **Used_At (ProductID, Branch_ID, Used_Quantity)**

    - {ProductID, Branch_ID} —-> Used_Quantity

    - Candidate Key - ProductID, Branch_ID

        All FDs have left side = superkey. Hence, in BCNF

- **Supply (ProductID, Supplier_ID, Supplied_Date, Supplied_Quantity, Supplied_Rate)**

    - {ProductID, Supplier_ID, Supplied_Date} —->{Supplied_Quantity, Supplied_Rate}

    - Candidate Key - ProductID, Supplier_ID, Supplied_Date

        All FDs have left side = superkey. Hence, in BCNF

- **Books_Appointment (Customer_ID, Service_ID, Appointment_date, Branch_ID, Appointment_Time, Bill_ID)**

- ○ {Customer_ID, Service_ID, Appointment_date, Branch_ID} —->{ Appointment_Time, Bill_ID}

- ○ Candidate Key **-** Customer_ID, Service_ID, Appointment_date, Branch_ID

  All FDs have left side = superkey. Hence, in BCNF

- **Purchase (Customer_ID, ProductID, Purchase_Date, Branch_ID, Purchase_Quantity, Bill_ID)**

  - ○ {Customer_ID, ProductID, Purchase_Date, Branch_ID} —->{ Purchase_Quantity, Bill_ID}

  - ○ Candidate Key **-** Customer_ID, ProductID, Purchase_Date, Branch_ID

    All FDs have left side = superkey. Hence, in BCNF

- **Bill (Bill_ID, Amount, Discount, Payable_amount, Payment_mode)**

  - ○ Bill_ID —->{ Amount, Discount, Payable_amount, Payment_mode}

  - ○ Candidate Key **-** Bill_ID

    All FDs have left side = superkey. Hence, in BCNF

- ❖ **NOTE : Since all the above relations are in BCNF, they also satisfy the conditions of the lower normal forms, namely First Normal Form (1NF), Second Normal Form (2NF), and Third Normal Form (3NF).**

ER Diagram
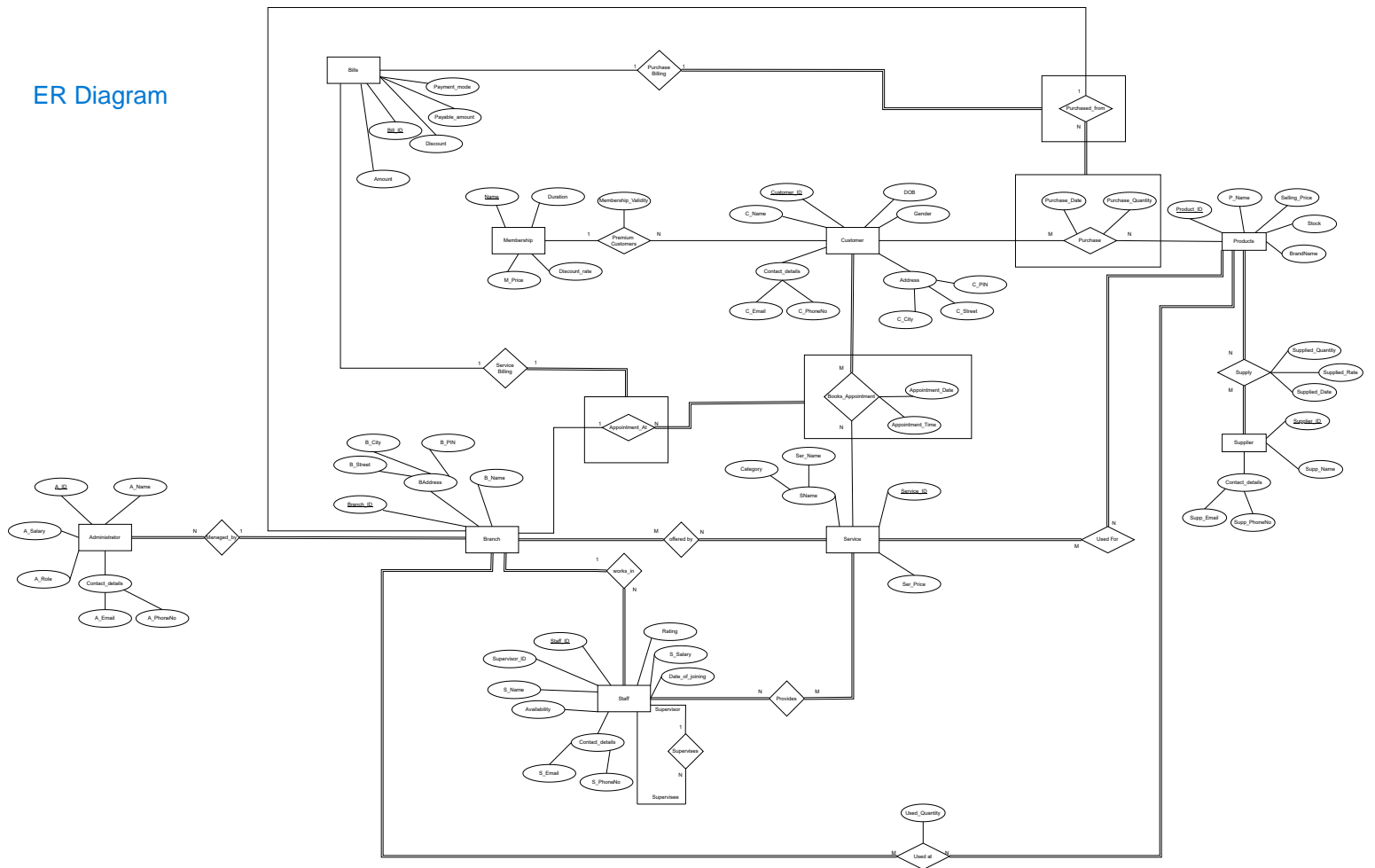
*Note : Rectangle around the relations representation has been used to show Aggregation for better visual.

Changes from the previous ER submission:

---->The aggregation relationships "Appointment_At" and "Purchased_From" have been added to the ER model to represent the branch association of a given service appointment or product purchase.
---->The participation of Bill has been relaxed to non-mandatory, as the same bill series is used for both service appointments and product purchases.

Relational Model

Offered by

PK,FK1	Branch_ID	INT
PK,FK2	Service_ID	INT

Bills

PK	Bill_ID	INT
	Amount	DECIMAL(10,2)
	Discount	DECIMAL(5,2)
	Payable_amount	DECIMAL(10,2)
	Payment_mode	VARCHAR(30)

Purchase

PK,FK1	Customer_ID	INT
PK,FK2	Product_ID	INT
PK,FK3	Branch_ID	INT
PK	Purchased_Date	DATE
	Purchased_Quantity	INT
FK	Bill_ID	INT

Supplier

PK	Supplier_ID	INT
	Supp_Name	VARCHAR(100)
	Supp_PhoneNo	VARCHAR(15)
	Supp_Email	VARCHAR(100)

Supply

PK,FK1	Supplier_ID	INT
PK,FK2	Product_ID	INT
PK	Supplied_Date	DATE
	Supplied_Rate	DECIMAL(10,2)
	Supplied_Quantity	INT

Provides

PK,FK1	Service_ID	INT
PK,FK2	Staff_ID	INT

Product

PK	Product_ID	INT
	P_name	VARCHAR(100)
	SellingPrice	DECIMAL(10,2)
	Stock	INT
	BrandName	VARCHAR(50)
FK	Supplier_ID	INT

Books_Appointment

PK,FK1	Customer_ID	INT
PK,FK2	Service_ID	INT
PK,FK3	Branch_ID	INT
PK	Appointment_Date	DATE
	Appointment_Time	TIME
FK	Bill_ID	INT

Services

PK	Service_ID	INT
	Ser_Price	DECIMAL(10,2)
	Ser_Name	VARCHAR(100)
	Category	VARCHAR(50)

Used For

PK,FK1	Service_ID	INT
PK,FK2	Product_ID	INT

Used At

PK,FK1	Product_ID	INT
PK,FK2	Branch_ID	INT
	Used_Quantity	INT

Branch

PK	Branch_ID	INT
	B_Name	VARCHAR(100)
	B_Street	VARCHAR(100)
	B_City	VARCHAR(50)
	B_PIN	VARCHAR(100)

Customer

PK	Customer_ID	INT
	C_Name	VARCHAR(100)
	C_PhoneNo	VARCHAR(15)
	C_Email	VARCHAR(100)
	DOB	DATE
	Gender	VARCHAR(15)
	C_PIN	VARCHAR(10)
	C_Street	VARCHAR(100)
	C_City	VARCHAR(50)

Premium Customers

PK,FK1	Customer_ID	INT
PK,FK2	M_name	VARCHAR(50)
	Membership_Validity	DATE

Membership

PK	M_name	VARCHAR(50)
	Duration	INT
	M_Price	DECIMAL(10,2)
	Discount_rate	DECIMAL(5,2)

Administrator

PK	A_ID	INT
FK	Branch_ID	INT
	A_Name	VARCHAR(100)
	A_PhoneNo	VARCHAR(15)
	A_Email	VARCHAR(100)
	A_Salary	DECIMAL(10,2)
	A_Role	VARCHAR(50)

Staff

PK	Staff_ID	INT
	S_name	VARCHAR(100)
	S_PhoneNo	VARCHAR(15)
	S_Email	VARCHAR(100)
	Availability	VARCHAR(50)
	Rating	INT
	S_Salary	DECIMAL(10,2)
	Date_of_Joining	DATE
FK	Supervisor_ID	INT
FK	Branch_ID	INT