

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_VValidity

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
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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  $\rightarrow$  {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\_VValidity)**

- {Customer\_ID, M\_name}  $\rightarrow$  {Membership\_VValidity}
- 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  $\rightarrow$  {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)**

- $A\_ID \rightarrow \{A\_Name, A\_Email, A\_PhoneNo, A\_Salary, A\_Role, Branch\_ID\}$
- Candidate Key - A\_ID

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

- **Branch (Branch\_ID, B\_Name, B\_Street, B\_City, B\_PIN)**

- $Branch\_ID \rightarrow \{B\_Name, B\_Street, B\_City, B\_PIN\}$
- Candidate Key - Branch\_ID

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

- **Used\_At (ProductID, Branch\_ID, Used\_Quantity)**

- $\{ProductID, Branch\_ID\} \rightarrow Used\_Quantity$
- Candidate Key - ProductID, Branch\_ID

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

- **Supply (ProductID, Supplier\_ID, Supplied\_Date, Supplied\_Quantity, Supplied\_Rate)**

- $\{ProductID, Supplier\_ID, Supplied\_Date\} \rightarrow \{Supplied\_Quantity, Supplied\_Rate\}$
- 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}  $\rightarrow$  {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}  $\rightarrow$  {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  $\rightarrow$  { 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).**