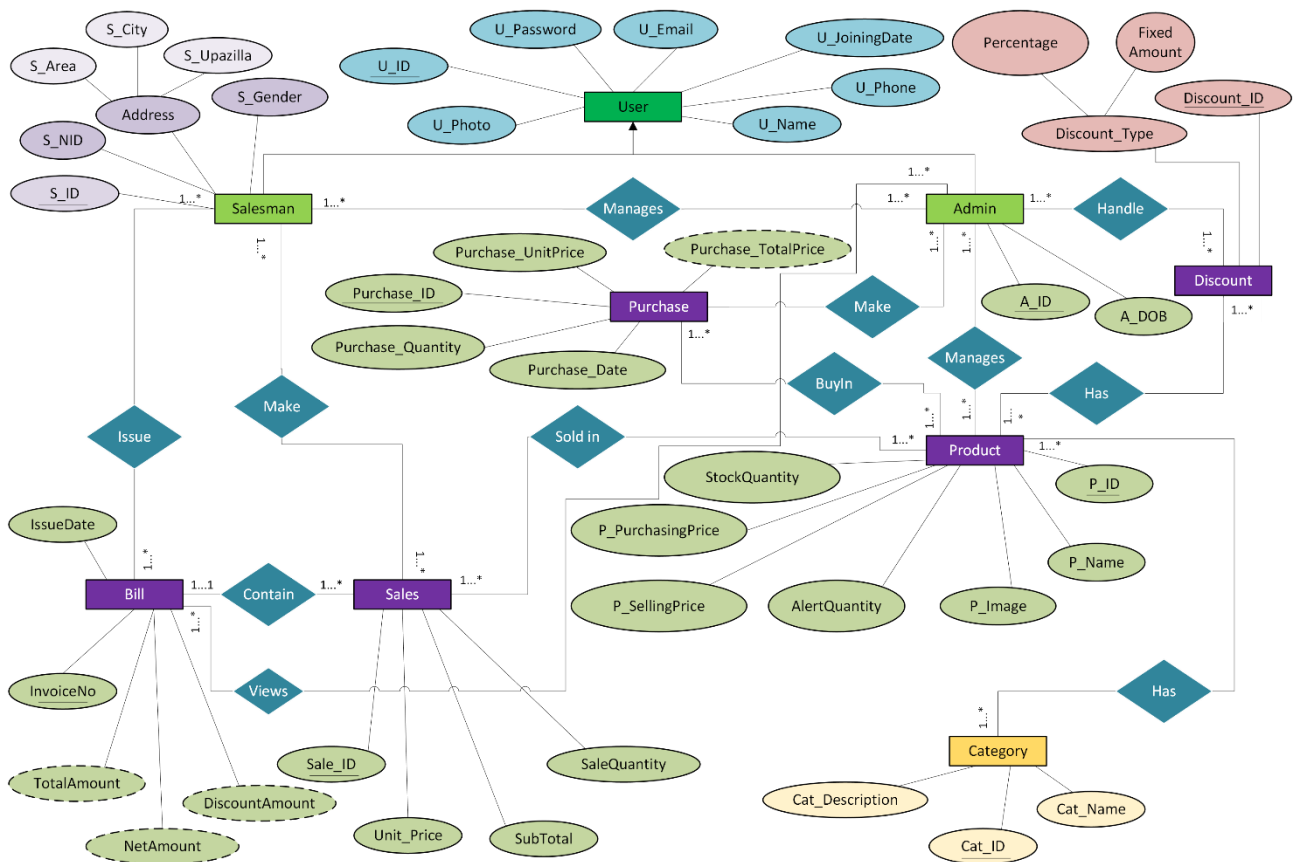# ER Diagram: Supershop Management System

Normalization

User / Admin / Salesman >> Occur Inheritance	
User:	U_ID, U_Password, U_Name, U_Email, U_Phone, U_Image, U_JoiningDate

Admin Manages Salesman: (m-m)	
1NF	I. A_ID, A_DOB, S_ID, S_NID, S_Gender, S_Area, S_Upazilla, S_City.
2NF	I. A_ID(PK + FK) ref 'User', A_DOB II. S_ID(PK + FK) ref 'User', S_NID, S_Gender, S_Area, S_Upazilla, S_City III. A_ID(PK), S_ID(FK)
3NF	No transitive dependency

Admin Handle Discount: (m-m)	
1NF	I. A_ID, A_DOB, Discount_ID, Percentage, FixedAmount
2NF	I. A_ID, A_DOB, II. Discount_ID, Percentage, FixedAmount. III. A_ID(PK), Discount_ID(FK).
3NF	No transitive dependency

Admin Manages Product: (m-m)	
1NF	I. A_ID, A_DOB, P_ID, P_Name, P_Image, P_PurchasingPrice, P_SellingPrice, P_StockQunatity, P_AlertQuantity
2NF	I. A_ID, A_DOB, II. P_ID, P_Name, P_Image, P_PurchasingPrice, P_SellingPrice, P_StockQunatity, P_AlertQuantity. III. A_ID(PK), P_ID(FK).
3NF	No transitive dependency

Admin Make Purchase: (m-m)	
1NF	I. A_ID, A_DOB, Purchase_ID, Purchase_Quantity, Purchase_UnitPrice, Purchase_TotalPrice, Purchase_Date.
2NF	I. A_ID(PK), A_DOB II. Purchsase_ID(PK), Purchase_Quantity, Purchase_UnitPrice, Purchase_TotalPrice, Purchase_Date.A_ID(PK), P_ID(FK). III. A_ID(PK), P_ID(FK).
3NF	No transitive dependency

Admin Views Bill: (m-m)		
1NF	I.	<u>A_ID</u>, A_DOB, <u>InvoiceNo</u>, IssueDate
2NF	I.	<u>A_ID</u>, A_DOB
	II.	<u>InvoiceNo(PK)</u>, IssueDate.
	III.	<u>A_ID</u>(PK), P_ID(FK).
3NF		No transitive dependency

Product Has Category: (m-m)		
1NF	I.	<u>P_ID</u>, P_Name, P_Image, P_PurchasingPrice, P_SellingPrice, P_StockQunatity, P_AlertQuantity, <u>Cat_ID</u>, Cat_Name, Cat_Description.
2NF	I.	<u>P_ID(PK)</u>, P_Name, P_Image, P_PurchasingPrice, P_SellingPrice, P_StockQunatity, P_AlertQuantity
	II.	<u>Cat_ID(PK)</u>, Cat_Name, Cat_Description.
	III.	<u>P_ID</u>(pk), Cat_ID(FK)
3NF		No transitive dependency

Product Has Discount: (m-m)		
1NF	I.	<u>P_ID</u>, P_Name, P_Image, P_PurchasingPrice, P_SellingPrice, P_StockQunatity, P_AlertQuantity, <u>Discount_ID</u>, Percentage, FixedAmount
2NF	I.	<u>P_ID(PK)</u>, P_Name, P_Image, P_PurchasingPrice, P_SellingPrice, P_StockQunatity, P_AlertQuantity.
	II.	<u>Discount_ID(PK)</u>, Percentage, FixedAmount .
	III.	<u>P_ID</u>(pk), Discount_ID(FK)
3NF		No transitive dependency

Product Buy In Purchase: (m-m)		
1NF	I.	<u>P_ID</u>, P_Name, P_Image, P_PurchasingPrice, P_SellingPrice, P_StockQunatity, P_AlertQuantity, <u>Purchsase_ID</u>, Purchase_Quantity, Purchase_UnitPrice, Purchase_TotalPrice, Purchase_Date.
2NF	I.	<u>P_ID(PK)</u>, P_Name, P_Image, P_PurchasingPrice, P_SellingPrice, P_StockQunatity, P_AlertQuantity.
	II.	<u>Purchsase_ID</u>, Purchase_Quantity, Purchase_UnitPrice, Purchase_TotalPrice, Purchase_Date.
	III.	<u>P_ID</u>(pk), Purchase_ID(FK)
3NF		No transitive dependency

Product Sold In Sale: (m-m)		
1NF	I.	<u>P_ID</u>, P_Name, P_Image, P_PurchasingPrice, P_SellingPrice, P_StockQunatity, P_AlertQuantity, <u>Sale_ID</u>, Unit_Price, Sale_Quantity, Sale_SubTotal.
2NF	I.	<u>P_ID(PK)</u>, P_Name, P_Image, P_PurchasingPrice, P_SellingPrice, P_StockQunatity, P_AlertQuantity.
	II.	<u>Sale_ID</u>(PK), Unit_Price, Sale_Quantity, Sale_SubTotal.
	III.	<u>P_ID</u>(pk), Sale_ID(FK)
3NF		No transitive dependency. Same as 2NF

Salesman Make Sales: (M-M)		
1NF	I.	S_ID, S_NID, S_Gender, S_Area, S_Upazilla, S_City, Sale_ID, Unit_Price, Sale_Quantity, Sale_SubTotal.
2NF	I.	S_ID(PK), S_NID, S_Gender, S_Area, S_Upazilla, S_City.
	II.	Sale_ID(PK), Unit_Price, Sale_Quantity, Sale_SubTotal.
	III.	S_ID(PK), Sale_ID(FK)
3NF		No transitive dependency. Same as 2NF

Salesman Issue Bill: (M-M)		
1NF	I.	S_ID, S_NID, S_Gender, S_Area, S_Upazilla, S_City, InvoiceNo(PK), IssueDate.
2NF	I.	S_ID(PK), S_NID, S_Gender, S_Area, S_Upazilla, S_City.
	II.	Sale_ID(PK), Unit_Price, Sale_Quantity, Sale_SubTotal.
	III.	S_ID(PK), InvoiceNO(FK).
3NF		No transitive dependency. Same as 2NF

Bill Contain Sale: (1-M)		
1NF	I.	InvoiceNo(PK), IssueDate, Sale_ID, Sale_Quantity, Unit_Price, SubTotal.
2NF	I.	InvoiceNo(PK), Sale_ID(FK), Sale_Quantity, Unit_Price, SubTotal.
	II.	InvoiceNo(PK), IssueDate
3NF		No transitive dependency. Same as 2NF

Finalization

1. A_ID(PK + FK) ref 'User', A_DOB
2. S_ID(PK + FK) ref 'User', S_NID, S_Gender, S_Area, S_Upazilla, S_City
3. A_ID(PK), S_ID(FK)
4. ~~A_ID(PK), A_DOB~~
5. Discount_ID(PK), Percentage, FixedAmount.
6. A_ID(PK), Discount_ID(FK).
7. ~~A_ID, A_DOB~~
8. P_ID(PK), P_Name, P_Image, P_PurchasingPrice, P_SellingPrice, P_StockQunatity, P_AlertQuantity.
9. A_ID(PK), P_ID(FK).
10. ~~A_ID(PK), A_DOB~~
11. Purchsase_ID(PK), Purchase_Quantity, Purchase_UnitPrice, Purchase_TotalPrice, Purchase_Date.A_ID(PK), P_ID(FK).
12. ~~A_ID(PK), P_ID(FK).~~
13. ~~A_ID, A_DOB~~
14. InvoiceNo(PK), IssueDate.
15. ~~A_ID(PK), P_ID(FK).~~
16. ~~P_ID(PK), P_Name, P_Image, P_PurchasingPrice, P_SellingPrice, P_StockQunatity, P_AlertQuantity~~
17. Cat_ID(PK), Cat_Name, Cat_Description.
18. P_ID(pk), Cat_ID(FK)
19. ~~P_ID(PK), P_Name, P_Image, P_PurchasingPrice, P_SellingPrice, P_StockQunatity, P_AlertQuantity.~~
20. ~~Discount_ID(PK), Percentage, FixedAmount .~~
21. P_ID(pk), Discount_ID(FK)
22. ~~P_ID(PK), P_Name, P_Image, P_PurchasingPrice, P_SellingPrice, P_StockQunatity, P_AlertQuantity.~~
23. ~~Purchase_ID, Purchase_Quantity, Purchase_UnitPrice, Purchase_TotalPrice, Purchase_Date.~~
24. P_ID(pk), Purchase_ID(FK)
25. ~~P_ID(PK), P_Name, P_Image, P_PurchasingPrice, P_SellingPrice, P_StockQunatity, P_AlertQuantity.~~
26. Sale_ID(PK), Unit_Price, Sale_Quantity, Sale_SubTotal.
27. P_ID(pk), Sale_ID(FK)
28. ~~S_ID(PK), S_NID, S_Gender, S_Area, S_Upazilla, S_City.~~
29. ~~Sale_ID(PK), Unit_Price, Sale_Quantity, Sale_SubTotal.~~
30. S_ID(PK), Sale_ID(FK)
31. ~~S_ID(PK), S_NID, S_Gender, S_Area, S_Upazilla, S_City.~~
32. ~~Sale_ID(PK), Unit_Price, Sale_Quantity, Sale_SubTotal.~~

33. ~~S_ID(PK), InvoiceNO(FK).~~
34. InvoiceNo(PK), Sale_ID(FK), Sale_Quantity, Unit_Price, SubTotal.
35. ~~InvoiceNo(PK), IssueDate~~

Final Table:

1. **Admin:** A_ID(PK + FK) ref 'User', A_DOB
2. **Salesman:** S_ID(PK + FK) ref 'User', S_NID, S_Gender, S_Area, S_Upazilla, S_City
3. **AdminSalesman:** A_ID(PK), S_ID(FK)
4. **Discount:** Discount_ID(PK), Percentage, FixedAmount.
5. **AdminDiscount:** A_ID(PK), Discount_ID(FK).
6. **Product:** P_ID(PK), P_Name, P_Image, P_PurchasingPrice, P_SellingPrice, P_StockQunatity, P_AlertQuantity.
7. **AdminProduct:** A_ID(PK), P_ID(FK).
8. **Purchase:** Purchase_ID(PK), Purchase_Quantity, Purchase_UnitPrice, Purchase_TotalPrice, Purchase_Date.
9. **Bill:** InvoiceNo(PK), IssueDate.
10. **Category:** Cat_ID(PK), Cat_Name, Cat_Description.
11. **ProductCategory:** P_ID(pk), Cat_ID(FK)
12. **ProductDiscount:** P_ID(pk), Discount_ID(FK)
13. **ProductPurchase:** P_ID(pk), Purchase_ID(FK)
14. **Sale:** Sale_ID(PK), Unit_Price, Sale_Quantity, Sale_SubTotal.
15. **ProductSale:** P_ID(pk), Sale_ID(FK)
16. **SalesmnSale:** S_ID(PK), Sale_ID(FK)
17. **SalesmanBill:** S_ID(PK), InvoiceNO(FK).
18. **BillSale:** InvoiceNo(PK), Sale_ID(FK), Sale_Quantity, Unit_Price, SubTotal.