Relations and Normalization

Relations

The final relations are listed below:

Customer

SSN	First Name	Last Name	Phone	Gender	Address	Date of Birth	Insurance ID

Primary Key: SSN

Foreign Key: Customer(Insurance ID) → Insurance(Insurance ID)

Insurance

Insurance ID	Company Name	Start Date	End Date	Co-Insurance

Primary Key: Insurance ID

Employee

ID	SSN	License	First Name	Last Name	Start Date	End Date	Role
Salary	Phone Number	Date of Birth					

Primary Key: ID

Prescription

Prescription ID	SSN	Doctor ID	Prescription Date

Primary Key: Prescription ID
Foreign Key: Prescription(SSN) → Customer(SSN)

Prescribed Drugs

Prescription ID	Drug Name	Prescribed Quantity	Refill Limit

Primary Key: Prescription ID, Drug Name
Foreign Key: Prescribed Drugs(Prescription ID) → Prescription(Prescription ID)

Order

Order ID	Prescription ID	EmployeeID	Order Date

Primary Key: Order ID
Foreign Key: Order(Prescription ID) → Prescription(Prescription ID), Order(Employee ID) → Employee(ID)

Ordered Drugs

Order ID	Drug Name	Batch Number	Quantity	Price

Primary Key: Order ID, Drug Name, Batch Number
Foreign Key: Ordered Drugs(Order ID) → Order(Order ID), Ordered Drugs(Drug Name, Batch Number) → Medicine(Drug Name, Batch Number)

Bill

Order ID	CustomerSSN	Total Amount	Customer Payment	Insurance Payment

Primary Key: Order ID, Customer SSN
Foreign Key: Bill(Order ID) → Order(Order ID), Bill(Customer SSN) → Customer(SSN)

Medicine

Drug Name	Batch Number	Medicine Type	Manufacturer	Quantity	Expiry Date	Price

Primary Key: Drug Name, Batch Number

Disposed Drugs

Drug Name	Batch Number	Quantity	Company

Primary Key: Drug Name, Batch Number
Foreign Key: Disposed Drugs(Drug Name, Batch Number) → Medicine(Drug Name, Batch Number)

Notification

ID	Message	Type

Primary Key: ID

Employee_Disposed Drugs

Employee ID	Drug Name	Batch Number	Disposal Date

Primary Key: Employee ID, Drug Name, Batch Number, Disposal Date
Foreign Key: Employee_Disposed Drugs(Employee ID) → Employee (Employee ID), Employee_Disposed Drugs(Drug Name, Batch Number) → Disposed Drugs(Drug Name, Batch Number)

Employee Notification

Employee ID	Notification ID

Primary: Employee ID, Notification ID
Foregin Key: Employee Notification(Employee ID) → Employee(ID), Employee Notification(Notification ID) → Notification(Notification ID)

Normalization

The following dependencies exist in our schema:

1. Insurance(Insurance ID, Company Name, Start Date, End Date, Co-Insurance)
Insurance ID → Company Name, Start Date, End Date, Co-Insurance

2. Customer(SSN, First Name, Last Name, Phone, Gender, Address, Dateof Birth, Insurance ID)
SSN → First Name, Last Name, Phone, Gender, Address, Date of Birth, Insurance ID

3. Prescription(Prescription ID, SSN, Doctor ID, Prescribed Date)
Prescription ID → SSN, Doctor ID, Prescribed Date

4. Prescribed_Drugs(Prescription ID, Drug Name, Prescribed Quantity, Refill Limit)
Prescription ID, Drug Name → Prescribed Quantity, Refill Limit

5. Order(Order ID, Prescriptio ID, Employee ID, Order Date)
Order ID → Prescriptio ID, Employee ID, Order Date

6. Ordered Drugs(Order ID, Dug Name, Batch Number, Ordered Quantity, Price)
Order ID, Dug Name, Batch Number → Ordered Quantity, Price

7. Bill(Order ID, CustomerSSN, Total Amount, Customer Payment, Insurance Payment)
Order ID, CustomerSSN → Total Amount, Customer Payment, Insurance Payment

8. Employee(Employee ID, SSN, First Name, Last Name, Start Date, End Date, Role, Salary, Phone Number, Date of Birth)
Employee ID → SSN, First Name, Last Name, Start Date, End Date, Role, Salary, Phone Number, Date of Birth

9. Employee_Notification(Employee ID, Notification ID)
All Keys.

10. Notification(Notification ID, Type, Message)
Notification ID → Type, Message

11. Employee_Disposed_Drugs(Employee ID, Drug Name, Batch Number, Disposal Date)
All Keys.

12. Disposed Drugs(Drug Name, Batch Number, Quantity, Company)
Drug Name, Batch Number → Quantity, Company

13. Medicine(Drug Name, Batch Number, Medicine Type, Manufacturer, Stock Quantity, Expiry Date, Price)
Drug Name, Batch Number → Medicine Type, Manufacturer, Stock Quantity, Expiry Date, Price

None of the above dependencies violate 3NF rules, so above relations are in 3NF.