Name	City	Age	Phone Number
Ashraf	mumbai	22	9.24E+08
Vishal	asda	22	9.24E+08
Sanjeev	pune	22	9.24E+08
Venakt	kotai	22	9.24E+08
Venakt	kotai	22	9.24E+08

Order Details

OrderID	ProductID	Quantity
123	35X	1
143	35X	3

Customer Detaisl

Cutomer ID	Order ID	Customer Name
24	123	Kunal

Student Detaisl

Student ID	Student Name	Email
2	Hariom	

{StudentID, Student Name} -> StudnetID

X & Y

Stutend ID	Student Name

Order Details

OrderID	ProductID	Quantity
123	35X	1
143	35X	3

ProductID	Product Name
35X	Cornflakes

A->B B->C

EmployeeID	DepartmentID
13	CSE

DepartmentID	Department Name
CSE	Computer Science

Student ID	Stdent Name	Course Id	Course Name
1	Ram	C1	DBMS
2	Anil	C2	Computer Networs
3	Kunal	C1	DBMS
4	Alekya	C1	DBMS
5	Sanjeev		
NULL		C3	OOPS

Student ID	Student Name
1	Ram
2	Anil
3	Kunal

Student Id	Course ID
1	C1
2	C2
3	C1

CustomerID	Name
101	John Smith

1NF Violation: The OrderID and ProductID columns contain

CustomerID	Name
101	John Smith
101	John Smith

OrderID	ProductID
O1	P1
O1	P2
O2	P3

order date is dependet on order id
product name and price is dpednet on produc
customer name is dependetn on customer id

OrderID	CustomerID	OrderDate
O1	101	15/01/23
O2	102	20/02/23

CustomerID	CustomerName
101	John Smith

102	Jane Doe	

OrderID	ProductID	Quantity
O1	P1	2
O1	P2	1
O2	P3	1

ProductID	ProductName	Price
P1	Laptop	1000
P2	Mouse	20
P3	Keyboard	75

EmployeeID	Name	DepartmentID
1	John Smith	10
2	Jane Doe	20
3	Bob Johnson	10

Employee Id -Primary Key

Employee ID -> DepartMEntID-> Departname Name, LOcation

DepartmentID	DepartmentName	Location
10	Sales	New York
20	Marketing	Los Angeles
10	Sales	New York

EmployeeID	Name	DepartmentID
1	John Smith	10
2	Jane Doe	20
3	Bob Johnson	10

EmployeeID	Name
101	John Smith
102	Jane Doe
103	Bob Johnson

3NF Violation:

ProductID	ProductName
1	Laptop
2	Mouse
3	Keyboard
4	T-Shirt

Primary Key - Product ID

CategoryID	CategoryName
101	Electronics
202	Clothing

CourseID	InstructorID	
CS101		1
MATH202		2
CS101		3

Cohort	Email
	11
	11
	11
	11
	11

Product Name
Cornflakes
Cornflakes

Cohort ID

A->C

Factulty Id	Faculty Name	Salary	
F1	John	50k	
F2	Dhiraj	40k	
F1	John	30k	50k
F1	John	30k	50k

F3 Gurman

Faculty Id	FNAME	Salary
F1	John	50k
F2	Dhiraj	40k

Course Id	Course Name
C1	DBMS
C2	Computer Networs

Course ID	Faluty ID
C1	F1
C2	F2

OrderID	**ProductID**	**ProductName**	**Quantity**
O1, O2	P1, P2	Laptop, Mouse	2, 1

multiple values in a single cell, violating the atomicity requirement of 1NF.

OrderID	**ProductID**	**ProductName**	**Quantity**
O1	P1	Laptop	2
O2	P2	Mouse	1

CustomerID	**CustomerName**	**OrderDate**	**ProductNam**	**Quantity**
101	John Smith	15/01/23	Laptop	2
101	John Smith	15/01/23	Mouse	1
102	Jane Doe	20/02/23	Keyboard	1

:t id

2NF Violation:

Primary Key: {OrderID, ProductID}

CustomerName is dependent on CustomerID, which is only part of t

OrderDate is dependent on OrderID, which is only part of the prima

ProductName and Price are dependent on ProductID, which is only
2NF Normalization Reason: To remove partial dependencies, e

DepartmentName	Location
Sales	New York
Marketing	Los Angeles
Sales	New York

Salary	DepartmentID	DepartmentName	Location
50000	10	Sales	New York
60000	20	Marketing	Los Angeles
55000	10	Sales	New York

CategoryID
101
101
101
202

InstructorName
Prof. Smith
Dr. Jones
Prof. Smith

Price
1000
20
75

:he primary key.
ary key.

ensuring that non-key attributes depend on the entire primary key, not just a part of it. Thi

s reduces redundancy (e.g., CustomerName repeating for the same customer) and avoid

s update anomalies.