

Task 1

1. **Primary key:** ProductID and SupplierID

2. NEW RELATION

(ProductID, ProductName, Price, SupplierID,
SupplierName, Factory, City, State,
RepresentativePhone, ManagerPhone)

Partial key: ProductID \rightarrow ProductName

SupplierID \rightarrow SupplierName, RepresentativePhone, Factory

T1 (ProductID, ~~ProductName~~, Price, SupplierID,
~~SupplierName~~, ~~Factory~~, City, State,
~~RepresentativePhone~~, ManagerPhone)

T2 (ProductID,
ProductName)

T3 (SupplierID, SupplierName,
RepresentativePhone, Factory)

3.

Transitive Dependencies:

Factory \rightarrow City, State, ManagerPhone

T1 (ProductID, Price, SupplierID, ~~City~~, ~~State~~, ~~ManagerPhone~~)

T2 (ProductID, ProductName)

T3 (SupplierID, SupplierName, RepresentativePhone, Factory)

T4 (Factory, City, State, ManagerPhone)

Task 2

New Customer Relation

CUSTOMER(CustomerID, Name, DateOfBirth, ReferrerID, ~~PaymentMethods~~)

4.

Payment Methods stores multiple payment methods for each customer (may contain a list of multiple payment method)

In order to satisfy 1NF, I remove the Payment Method in original relation and establish a new one (T2)

T2 (CustomerID, PaymentMethods)

5. The redundancy would be in the repeated Customer-ID for each payment method.

For example:

CustID	Payment Method
C01	Visa
C01	Mastercard
C01	Discover
C02	PayPal

C01 has 3 different methods, then the custID will appear 3 times

6.

CUSTOMER(CustomerID, Name, Date of Birth, ReferrerID)

T2 (CustomerID, Payment Methods)

→ Satisfy 3NF. No partial dependencies
No transitive dependencies

TASK 3

FACTORY (Factory, City, State, ManagerPhone)

SUPPLIER (SupplierID, Factory, SupplierName, RepresentativePhone)

REVIEW (ProductID, Number, Rating, Text)

PRODUCTID (ProductID, ProductName)

PRODUCT (ProductID, Price, SupplierID)

LINEITEM (Quantity, ProductID, OrderNumber)

PAYMENT (CustomerID, PaymentMethods)

ORDERS (CustomerID, OrderNumber, OrderDate)

CUSTOMER (CustomerID, Name, Date of Birth, ReferrerID)

ADDRESS (CustomerID, Address)

