Name:Preksha Raj Shimoga Basavaraja

USC ID:7446436992

A)

Non-trivial functional dependencies:

- Product -> UnitOfMeasure
- Product -> DeptCode
- {Product, Supplier} -> Quantity, Cost, ImportDate

Normalization to 3NF:

Product_Bought
Composite Primary Key: Product and Supplier

Product	**Supplier**	ImportDate	Cost	Quantity

Product_Department
Primary Key: Product

Product	UnitOfMeasure	DeptCode

1NF- The given table is not in 1NF because it does not have primary keys Product And Supplier are notidentified .
2NF- The table is not in 2NF because the UnitOfMeasure, DeptCode depends only on Product instead of {Product,Supplier}.
The Quantity,Cost,ImportDate depends on Product and Supplier.
3NF- The table is not in 3NF because it is not in 1NF and 2NF there are no transitive dependencies listed.

B)

Non-trivial functional dependencies:

- Dept -> DeptName
- Product Code -> DeptCode
- ProductCode -> UnitOfMeasure
- {ProductCode,Date} -> Quantity, ListPrice

Normalization to 3NF:

Pro_Sold
Composite Primary Key: ProductCode and ImportDate

ProductCode	**Date**	Quantity	ListPrice

Pro_Dept
Primary Key: ProductCode

ProductCode	UnitOfMeasure	Dept

Department
Primary Key: Dept

Dept	DeptName

1NF- The given table is not in 1NF because it does not have primary keys ProductCode, Date are not identified.
2NF- The table was converted into 2NF by solving the partial dependencies. The UnitOfMeasure, Dept and DeptName depends only on ProductCode and not on Entire compoite primary key{ProductCode,Date}.
3NF- The table is not in 3NF because there are transitive dependencies involved DeptName depends on Dept which in turn depends on ProductCode.This is resolved by splitting the table into two.

C)

Non-trivial functional dependencies:

- CustId -> CustName
- CustId -> MembershipStatus
- MembershipStatus -> Discount
- RecieptId -> DateTime
- ReceiptId -> CustId
- {Quantity,ListPrice,Discount,ReceiptId} -> ActualPrice
- {RecieptId, ProductCode} -> Quantity

Normalization to 3NF:

Customer_Info
Primary Key: CustId

CustId	CustName	MembershipStatus

Mem_Discount
Primary Key: MembershipStatus

MembershipStatus	Discount

Quantity
Primary Key: ReceiptId

ReceiptId	DateTime	CustId

Actual_Price
Composite Primary Key: ReceiptId and ProductCode

ReceiptId	**ProductCode**	Quantity	ActualPrice

1NF- The given table is not in 1NF because it does not have primary keys ReceiptId, And ProductCode are not identified .
2NF- The table is not in 2NF because CustId, Custname, MembershipStatus, Discount and DateTime depends only on ReceiptId instead of {RecieptId, ProductCode}.

Quantity, ActualPrice depends on ProductCode and ReceiptId.

3NF- The table is not in 3NF because there is transitive dependencies are involved
Custname, MembershipStatus depends on CustomerId which is solve by splitting the Table.
Discount depends on MemebershipStatus which is solved by splitting the table into Two.
-ActualPrice is a derived attribute which depends on Quantity and Discount and ListPrice. ReceiptId.
ActualPrice depends on ListPrice which is derived from the previous table which in turn depends on ProductCode and ImportDate.
Discount can be obtained by linking the tables Customer_Info, Mem_Discount, Quantity, Actual_Price.