20S1 CZ2007 Project: Lab 3 Submission

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Relational schema

***We will only present non-trivial FDs

Relation #1

Shops (ShopName)
FDs: None
Key(s): {ShopName}
Primary key: {ShopName}

The relation is in 3NF.

Relation #2

Products (ProductID, Maker, Category, ProductName)
FDs: ProductID -> Maker, Category, ProductName
Key(s): {ProductID}
Primary key: {ProductID}

The relation is in 3NF.

Relation #3

ProductsInShop (ProductID, ShopName, Price, Stock)
FDs: ProductID, ShopName -> Price, Stock
Key(s): {ProductID, ShopName}
Primary key: {ProductID, ShopName}

The relation is in 3NF.

Relation #4

Records (ProductID, ShopName, StartDate, EndDate, Price)
FDs:

ProductID, ShopName, StartDate -> EndDate, Price
ProductID, ShopName, EndDate -> StartDate, Price

Key(s): {ProductID, ShopName, StartDate}, {ProductID, ShopName, EndDate}
Primary key: {ProductID, ShopName, StartDate}

Assumption:

1. Each product will have a unique endDate as the no two or more price changes can end on the same date for the same product.

R(ABCDE)
FDs: ABC -> DE, ABD -> CE
Key(s): {ABC}, {ABD}

ABC -> DE (ABC contains ABC)
ABD -> CE (ABD contains ABD)

The relation is in 3NF.

Relation #5

ProductsInOrder(ProductID, ShopName, OrderID, Quantity, DeliveryDate, Status, Price)
FDs: ProductID, ShopName, OrderID -> Quantity, DeliveryDate, Status, Price
Key(s): {ProductID, ShopName, OrderID}
Primary key: {ProductID, ShopName, OrderID}

The relation is in 3NF.

Relation #6

Orders(OrderID, UserID, TotalCost, DateTime, ShippingAddress)
FDs:

OrderID -> UserID, TotalCost, DateTime, ShippingAddress
UserID and DateTime -> OrderID, TotalCost, ShippingAddress

Key(s): OrderID, {UserID, DateTime}
Primary key: {OrderID}

Assumption:

1. UserID alone cannot determine ShippingAddress since the same user may choose to ship to different addresses (Example: friend's house, office, etc..).
2. UserID and DateTime can determine the other attributes, assuming that the same user can only place one order at any one time.
3. A user can only submit a single order at any one time, which means that DateTime will always be unique for each UserID.

R(ABCDE)
FDs: A -> BCDE, BD -> ACE
Keys: {A}, {BD}

A -> BCDE (A contains A)

BD -> ACE (BD contains BD)

The relation is in 3NF.

Relation #7

Users(UserID, Name)
FDs: UserID -> Name
Key(s): {UserID}
Primary key: UserID

The relation is in 3NF.

Relation #8

Rates(UserID, ProductID, Rating, Comment, DateTime)
FDs:
UserID, ProductID -> Rating, Comment, DateTime
UserID, DateTime -> Rating, Comment, ProductID
Key(s): {UserID, ProductID}, {UserID, DateTime}
Primary key: {UserID, ProductID}

Assumption:

1. A user can only add or modify a rating or comment at any one time, which means that DateTime will always be unique for each UserID.

R(ABCDE)
FDs: AB -> CDE, AE -> BCD
Keys: {AB}, {AE}

AB -> CDE (AB contains AB)
AE -> BCD (AE contains AE)

The relation is in 3NF.

Relation #9

Complaints(ComplaintID, Status, FiledDateTime, AddressedDateTime, Text, UserID, EmployeeID)
FDs:
ComplaintID -> Status, FiledDateTime, AddressedDateTime, Text, UserID, EmployeeID
UserID, FiledDateTime -> ComplaintID, Status, AddressedDateTime, Text, EmployeeID

Key(s): {ComplaintID}, {UserID, FiledDateTime}
Primary key: {ComplaintID}

Assumption:

1. A user can only file a complaint at any one time, which means that DateTime will always be unique for each UserID.

R(ABCDEFG)
FDs: A -> BCDEFG, CF -> ABDEG
Keys: {A}, {CF}

A -> BCDEFG (A contains A)
CF -> ABDEG (CF contains CF)

The relation is in 3NF.

Relation #10

ComplaintsOnOrder(ComplaintID, OrderID)
FDs: ComplaintID -> OrderID
Key(s): {ComplaintID}
Primary key: {ComplaintID}

The relation is in 3NF.

Relation #11

ComplaintsOnShop(ComplaintID, ShopName)
FDs: ComplaintID -> ShopName
Key(s): {ComplaintID}
Primary key: {ComplaintID}

The relation is in 3NF.

Relation #12

Employees(EmployeeID, MonthlySalary, Name)
FDs: EmployeeID -> MonthlySalary, Name
Key(s): {EmployeeID}
Primary key: {EmployeeID}

The relation is in 3NF.