Lab 10
Functional Dependencies and Constraints

202012053 – 202012054 – 202012055 – 202012056 – 202018027 - 202018028

1) City

- Functional Dependencies
  - CityID → Name

- Normal Form → BCNF
- Primary key → CityID
- Foreign key → none
- Candidate key → CityID
- Referential → WareHouse
- Domain:
  - CityID char(10) PRIMARY KEY,
  - Name varchar(20) not null

- As the CityID is the Candidate key here and all other attributes can be derived from it, the table is in BCNF.

2) Supplier

- Functional Dependencies
  - SupplierID → {Name, Contact, Address}

SupplierID →Name
SupplierID → Contact
SupplierID → Address

- Normal Form → BCNF
- Primary key → SupplierID
- Foreign key → none
- Candidate key → SupplierID
- Referential → Stock, SuppliedBy
- Domain
  - SupplierID char(10),
  - Name varchar(50) not null,
  - Contact char(10) unique not null CHECK (contact not like '%[^0→9]%'),
  - Address Text,
- As the SupplierID is the Candidate key here and all other attributes can be derived from it, the table is in BCNF.

3. Stock

- Functional Dependencies
  - {ItemID, WarehouseID, SupplierID} → {Quantity}

- Normal Form → BCNF
- Primary key → SupplierID, ItemID, WarehouseID
- Foreign key → SupplierID, ItemID, WarehouseID

- Candidate key → SupplierID, ItemID, WarehouseID
- Referential → none
- Domain
  - ItemID char(10),
  - WarehouseID char(10),
  - SupplierID char(10),
  - Quantity integer

- As the SupplierID, ItemID and WarehouseID combined are the Candidate key here and all other attributes can be derived from them, the table is in BCNF.

4) Warehouse

- Fumctional Dependencies
  - {WarehouseID} → {ManagerID, CityID, Name, TotalCapacity, UsedCapacity}

WarehouseID → ManagerID
WarehouseID → CityID
WarehouseID → Name
WarehouseID → TotalCapacity
WarehouseID → UsedCapacity

- Normal Form → BCNF
- Primary key → WarehouseID
- Foreign key → CityID
- Candidate key → WarehouseID
- Referential → Employee, Stock
- Domain
  - WarehouseID char(10),
  - ManagerID char(10),
  - CityID char(10) ,
  - Name char(30),
  - Total_Capacity numeric,
  - Used_Capacity numeric

- As the WarehouseID is the Candidate key here and all other attributes can be derived from it, the table is in BCNF.

5) Item

- Functional Dependencies
  - ItemID → {CategoryID, Name, Cost}

ItemID → CategoryID
ItemID → Name
ItemID → Cost

- Normal Form → BCNF
- Primary key → ItemID
- Foreign key → CategoryID

- Candidate key → ItemID
- Referential → OrderContains, Stock
- Domain
  - ItemID char(10),
  - CategoryID char(10),
  - Name varchar(20),
  - Cost integer

- As the ItemID is the Candidate key here and all other attributes can be derived from it, the table is in BCNF.

6) Item_Category

- Functional Dependencies
  - CategoryID → {Name, Description}

CategoryID → Name
CategoryID → Description

- Normal Form → BCNF
- Primary key → CategoryID
- Foreign key → None
- Candidate key → CategoryID
- Referential → Item
- Domain
  - CategoryID char(10),
  - Name varchar(20),
  - Description text

- As the CategoryID is the Candidate key here and all other attributes can be derived from it, the table is in BCNF.

7) SuppliedBy

- Functional Dependencies
  - {ItemID, OrderID} → SupplierID

- Normal Form → BCNF
- Primary key → ItemID, OrderID
- Foreign key → SupplierID
- Candidate key → ItemID, OrderID
- Referential → none
- Domain
  - SupplierID char(10),
  - ItemID char(10),
  - OrderID char(10)

- As the ItemID and OrderID combined are the Candidate key here and all other attributes can be derived from them, the table is in BCNF.

8) OrderContains

- Functional Dependencies: None
- Normal Form → BCNF
- Primary key → ItemID, OrderID
- Foreign key → ItemID, OrderID
- Candidate key → ItemID, OrderID
- Referential → SuppliedBy
- Domain
  - OrderID char(10,
  - ItemID char(10)

- As the ItemID and OrderID combined are the Candidate key here and all other attributes can be derived from them, the table is in BCNF.

9) Orders

- Functional Dependencies
  - {OrderID} → {TransportID, CustomerID, Order_Placed_Date, Order_Delivery_Date}

OrderID → TransportID
OrderID → CustomerID
OrderID → Order_Placed_Date
OrderID → Order_Delivery_Date

- Normal Form → BCNF
- Primary key → OrderID
- Foreign key → TransportID, CustomerID
- Candidate key → OrderID
- Referential → Payment, OrderContains
- Domain
  - OrderID char(10),
  - TransportID char(10),
  - CustomerID char(10),
  - Order_Placed_date date,
  - Order_delivery_date date

- As the OrderID is the Candidate key here and all other attributes can be derived from it, the table is in BCNF.

10) Customer

- Functional Dependencies
  - {CustomerID} → {Name, ContactNo, Address, City}

CustomerID → Name
CustomerID → ContactNo
CustomerID → Address
CustomerID → City

- Normal Form → BCNF
- Primary key → CustomerID
- Foreign key → None

- Candidate key → CustomerID
- Referential → Order
- Domain
  - CustomerID char(10),
  - Name varchar(20),
  - Contact char(10),
  - Address text,
  - City char(20)

- As the CustomerID is the Candidate key here and all other attributes can be derived from it, the table is in BCNF.

11) Transport

- Functional Dependencies
  - {TransportID} → {EmpID, VehicleID, Date}

TransportID → EmpID
TransportID → VehicleI
TransportID → Date

- Normal Form → BCNF
- Primary key → TransportID
- Foreign key → EmpID, VehicleID
- Candidate key → TransportID
- Referential → Order
- Domain
  - TransportID char(10),
  - Emp_ID char(10),
  - VehicleID char(10),
  - Date date

- As the TransportID is the Candidate key here and all other attributes can be derived from it, the table is in BCNF.

12) Employee

- Functional Dependencies
  - {Emp_ID} → {WarehouseID, Name, Salary, ContactNo}

Emp_ID → WarehouseID
Emp_ID → Name
Emp_ID → Salary
Emp_ID → ContactNo

- Normal Form → BCNF
- Primary key → EmpID
- Foreign key → WarehouseID
- Candidate key → EmpID
- Referential → Transport, Warehouse
- Domain

- Emp_ID char(10),
- WarehouseID char(10) ,
- Name char(20),
- Salary numeric,
- Contact char(10)

- As the EmpID is the Candidate key here and all other attributes can be derived from it, the table is in BCNF.

13) Payment

- Functional Dependencies
  - {OrderID} → {Account_No, Total_Cost}

OrderID → Account_No
OrderID → Total_Cost

- Normal Form → BCNF
- Primary key → OrderID
- Foreign key → OrderID
- Candidate key → OrderID
- Referential → Transport, Warehouse
- Domain
  - OrderID char(10),
  - Account_No char(14),
  - Total_Cost integer
- As the ordered is the Candidate key here and all other attributes can be derived from it, the table is in BCNF.

14) Vehicle

- Functional Dependencies
  - {VehicleID} → {Model}

- Normal Form → BCNF
- Primary key → VehicleID
- Foreign key → NONE
- Candidate key → VehicleID
- Referential → Transport
- Domain
  - VehicleID char(10),
  - Model varchar(20)
- As the VehicleID is the Candidate key here and all other attributes can be derived from it, the table is in BCNF.