**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.

1. **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.