Minimal FD Set

* PID 🡪 PhoneNumber
* PID 🡪 Address
* PID 🡪 Name
* PID 🡪 Email
* PID 🡪 BloodGroup
* PID 🡪 Age
* MhID 🡪 MedConditions
* MhID 🡪 PID
* MhID 🡪 Allergies
* AppID 🡪 Time
* AppID 🡪 Date
* AppID 🡪 Status
* AppID 🡪 PID
* AppID 🡪 StaffID
* StaffID 🡪 Name
* StaffID 🡪 Salary
* StaffID 🡪 Address
* StaffID 🡪 Type
* StaffID 🡪 PhoneNumber
* StaffID 🡪 LastPaymentDate
  + - * what about sub class?
* RepID 🡪 DateOfVisit
* RepID 🡪 PID
* RepID 🡪 Diagnosis
* RepID 🡪 Symptoms
* RepID 🡪 ConsultancyCharges
* {PresID} 🡪 MorningDosage
* {PresID} 🡪 AfternoonDosage
* {PresID} 🡪 EveningDosage
* {PresID} 🡪 Quantity
* {PresID} 🡪 Instructions
* a{PresID} 🡪 RepID
* MedID 🡪 MedName
* MedID 🡪 Rate
* MedID 🡪 StaffID
* {MedID, BatchNumber} 🡪 QtyAvailable
* {MedID, BatchNumber} 🡪 QtyOrdered
* {MedID, BatchNumber} 🡪 CostPrice
* {MedID, BatchNumber} 🡪 MfgDate
* {MedID, BatchNumber} 🡪ExpDate
* {MedID, BatchNumber} 🡪 StaffID
* InvNo 🡪 InvDate
* InvNo 🡪 TotalAmount
* InvNo 🡪 RepID
* InvNo 🡪 StaffID

**(3) Proof that relations are in BCNF**

**1. ‘Patient’ relation:**

• Attributes:

Patient {PID, PhoneNumber, Address, Name, Email, BloodGroup, Age}

• Functional dependencies:

PID 🡪 PhoneNumber

PID 🡪 Address

PID 🡪 Name

PID 🡪 Email

PID 🡪 BloodGroup

PID 🡪 Age

Let X = PID

X + = {PID, PhoneNumber, Address, Name, Email, BloodGroup, Age}

Thus, **Primary key = PID**

The left side of all the FDs in a minimal set of FDs for the relation ‘Patient’ is PID, which is the primary key of this relation, so **“Patient”** **is in BCNF.**

**2. ‘MedicalHistory’ relation:**

• Attributes:

MedicalHistory {PID, MedConditions, Allergies, MhID}

• Functional dependencies:

MhID 🡪 MedConditions

MhID 🡪 PID

MhID 🡪 Allergies

Let X = MhID

X + = {PID, MedConditions, Allergies, MhID}

Thus, **Primary key = MhID**

The left side of all the FDs in a minimal set of FDs for the relation ‘MedicalHistory’ is MhID, which is the primary key of this relation, so **“MedicalHistory”** **is in BCNF.**

**3. ‘Appointment’ relation:**

• Attributes:

Appointment {PID, Time, Date, Status, StaffID, AppID}

• Functional dependencies:

AppID 🡪 Time

AppID 🡪 Date

AppID 🡪 Status

AppID 🡪 PID

AppID 🡪 StaffID

Let X = AppID

X + = {PID, Time, Date, Status, StaffID, AppID}

Thus, **Primary key = AppID**

The left side of all the FDs in a minimal set of FDs for the relation ‘Appointment’ is AppID, which is the primary key of this relation, so **“Appointment”** **is in BCNF.**

**4. ‘Staff’ relation:**

• Attributes:

Staff { StaffID, Name, Salary, Address, Type}

• Functional dependencies:

StaffID 🡪 Name

StaffID 🡪 Salary

StaffID 🡪 Address

StaffID 🡪 Type

Let X = StaffID

X + = {StaffID, Name, Salary, Address, Type}

Thus, **Primary key = StaffID**

The left side of all the FDs in a minimal set of FDs for the relation ‘Staff’ is StaffID, which is the primary key of this relation, so **“Staff”** **is in BCNF.**

**5. ‘ClinicStaff’ relation:**

• Attributes:

ClinicStaff { StaffID, Role}

• Functional dependencies:

StaffID 🡪 Role

Let X = StaffID

X + = { StaffID, Role}

Thus, **Primary key = StaffID**

The left side of all the FDs in a minimal set of FDs for the relation ‘ClinicStaff’ is StaffID, which is the primary key of this relation, so **“ClinicStaff”** **is in BCNF.**

**6. ‘Report’ relation:**

• Attributes:

Report { RepID, DateOfVisit, PID, Diagnosis, Symptoms, ConsultancyCharges}

• Functional dependencies:

RepID 🡪 DateOfVisit

RepID 🡪 PID

RepID 🡪 Diagnosis

RepID 🡪 Symptoms

RepID 🡪 ConsultancyCharges

Let X = RepID

X + = { RepID, DateOfVisit, PID, Diagnosis, Symptoms, ConsultancyCharges}

Thus, **Primary key = RepID**

The left side of all the FDs in a minimal set of FDs for the relation ‘Report’ is RepID, which is the primary key of this relation, so **“Report”** **is in BCNF.**

**7. ‘Prescription’ relation:**

• Attributes:

Prescription { PresID, MedName, Quantity, MorningDosage, AfternoonDosage, EveningDosage, Instructions, RepID}

• Functional dependencies:

{PresID, MedName} 🡪 MorningDosage

{PresID, MedName} 🡪 AfternoonDosage

{PresID, MedName} 🡪 EveningDosage

{PresID, MedName} 🡪 Quantity

{PresID, MedName} 🡪 Instructions

{PresID, MedName} 🡪 RepID

Let X = {PresID, MedName}

X + = { PresID, MedName, Quantity, MorningDosage, AfternoonDosage, EveningDosage, Instructions, RepID}

Thus, **Primary key = {PresID, MedName}**

The left side of all the FDs in a minimal set of FDs for the relation ‘Prescription’ is {PresID, MedName}, which is the primary key of this relation, so **“Prescription”** **is in BCNF.**

**8. ‘MedicineDetails’ relation:**

• Attributes:

MedicineDetails { MedID, MedName, Rate}

• Functional dependencies:

MedID 🡪 MedName

MedID 🡪 Rate

Let X = MedID

X + = { MedID, MedName, Rate}

Thus, **Primary key = MedID**

The left side of all the FDs in a minimal set of FDs for the relation ‘MedicineDetails’ is MedID, which is the primary key of this relation, so **“MedicineDetails”** **is in BCNF.**

**9. ‘Inventory’ relation:**

• Attributes:

Inventory { MedID, BatchNumber, QtyAvailable, QtyOrdered, CostPrice, MfgDate, ExpDate , StaffID}

• Functional dependencies:

{MedID, BatchNumber} 🡪 QtyAvailable

{MedID, BatchNumber} 🡪 QtyOrdered

{MedID, BatchNumber} 🡪 CostPrice

{MedID, BatchNumber} 🡪 MfgDate

{MedID, BatchNumber} 🡪ExpDate

{MedID, BatchNumber} 🡪 StaffID

Let X = {MedID, BatchNumber}

X + = { MedID, BatchNumber, QtyAvailable, QtyOrdered, CostPrice, MfgDate, ExpDate , StaffID}

Thus, **Primary key = {MedID, BatchNumber}**

The left side of all the FDs in a minimal set of FDs for the relation ‘Inventory’is {MedID, BatchNumber}, which is the primary key of this relation, so **“Inventory”** **is in BCNF.**

**10. ‘Invoice’ relation:**

• Attributes:

Invoice { InvNo, InvDate, TotalAmount, RepID, StaffID}

• Functional dependencies:

InvNo 🡪 InvDate

InvNo 🡪 TotalAmount

InvNo 🡪 RepID

InvNo 🡪 StaffID

Let X = InvNo

X + = { RepID, DateOfVisit, PID, Diagnosis, Symptoms, ConsultancyCharges}

Thus, **Primary key = InvNo**

The left side of all the FDs in a minimal set of FDs for the relation ‘Invoice’ is InvNo, which is the primary key of this relation, so **“Invoice”** **is in BCNF.**