2. Apply the simple BCNF procedure to define BCNF tables using the FD list Table 2. Show the result of each step in your analysis. For the final result, you should show the tables, columns, primary key of each table, foreign keys, and unique constraints. You do not need to provide CREATE TABLE statements.

Table 2: FDs for the Big Patient Table

PatNo → PatAge
PatZip9 → PatCity
VisitNo → VisitDate
PatNo → PatZip9
ProvNo → ProvSpecialty
VisitNo → PatNo
VisitNo, ProvNo → Diagnosis
ProvNo → ProvEmail
ProvEmail → ProvNo

Step 1: Arrange the remaining FDs into groups by determinant

PatNo → PatAge, PatZip9

PatZip9 → PatCity

VisitNo → VisitDate, PatNo

ProvNo → ProvSpecialty, ProvEmail

VisitNo, ProvNo → Diagnosis

ProvEmail → ProvNo

Step 2: For each FD group, make a table with the determinant as the primary key. In the table list, the primary keys are underlined

Patient (PatNo, PatAge, PatZip9)

FOREIGN KEY (PatZip9) REFERENCES PatientZip

PatientZip (PatZip9, PatCity)

Visit(VisitNo, VisitDate, PatNo)

FOREIGN KEY (PatNo) REFERENCES Patient

Provider (ProvNo, ProvSpecialty, ProvEmail)

FOREIGN KEY (ProvEmail) REFERENCE Provider

Diagnosis(VisitNo, ProvNo, Diagnosis)

FOREIGN KEY (VisitNo) REFERENCES Visit

FOREIGN KEY (ProvNo) REFERENCES Provider

ProviderEmail (ProvEmail, ProvNo)

FOREIGN KEY (ProvNo) REFERENCES Provider

Step 3: Merge tables with the same columns and add UNIQUE constraints if necessary.

Patient (PatNo, PatAge, PatZip9)

FOREIGN KEY (PatZip9) REFERENCES PatientZip

PatientZip (PatZip9, PatCity)

Visit(VisitNo, VisitDate, PatNo)

FOREIGN KEY (PatNo) REFERENCES Patient

Provider (ProvNo, ProvSpecialty, ProvEmail)

FOREIGN KEY (ProvEmail) REFERENCE Provider

UNIQUE(ProvEmail)

Diagnosis(VisitNo, ProvNo, Diagnosis)

FOREIGN KEY (VisitNo) REFERENCES Visit

FOREIGN KEY (ProvNo) REFERENCES Provider