

Problem 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 \rightarrow PatAge
PatZip9 \rightarrow PatCity
VisitNo \rightarrow VisitDate
PatNo \rightarrow PatZip9
ProvNo \rightarrow ProvSpecialty
VisitNo \rightarrow PatNo
VisitNo, ProvNo \rightarrow Diagnosis
ProvNo \rightarrow ProvEmail
ProvEmail \rightarrow ProvNo

Solution:

List of FDs:

- PatNo \rightarrow PatAge, PatZip
- PatZip \rightarrow PatCity
- VisitNo \rightarrow PatNo, VisitDate
- ProvNo \rightarrow ProvSpecialty, ProvEmail
- ProvNo, VisitNo \rightarrow Diagnosis

BCNF Tables:

Table 1 (PatNo, PatAge, PatZip)

Foreign Key (PatZip) References Table1.1

Table 1.1 (PatZip, PatCity)

Table 2 (VisitNo, PatNo, VisitDate)

Foreign Key (PatNo) References Table 1

Table 3 (ProvNo, ProvSpecialty, ProvEmail)

Unique (ProvEmail)

Table 4 (ProvNo, VisitNo, Diagnosis)

Foreign Key (ProvNo) References Table 3

Foreign Key (VisitNo) References Table 2