Assignment 11

Problem 1

Insertion anomaly: To insert a new row with ProvNo. D4, we need to know the exact value of VisitNo. (Because the combination of ProvNo and VisitNo is unique.)

Update anomaly: To update a row with ProvNo D2. Two rows (2 & 3) are updated together. Which is not required.

Delete anomaly: If we delete a row with ProvNo D3, we lose data about PatNo P2, and lose data about VisitNo V82110.

Problem 2

Step 1: Grouping FD’s

PatNo PatAge, PatZip9

PatZip9 PatCity

VisitNo VisitDate, PatNo

ProvNo ProvSpeciality, ProvEmail

ProvEmail ProvNo

VisitNo, ProvNo Diagnosis

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.

Plot (PatNo, PatAge, PatZip9)

FOREIGN KEY (PatZip9) REFERENCES Plotmail

Plotmal (PatZip9, PatCity)

Visit (VisitNo, VisitDate, PatNo)

FOREIGN KEY (PatNo) REFERENCES Plot

Provider (ProvNo, ProvSpeciality, ProvEmail)

FOREIGN KEY (ProvEmail) REFERENCES Providermail

Providermail (ProvEmail, ProvNo)

FOREIGN KEY (ProvNo) REFERNECES Provider

Number (VisitNo, ProvNo, Diagnosis)

FOREIGN KEY (VisitNo) REFERENCES Visit

FOREIGN KEY (ProvNo) REFERENCES Provider

Step 3: Merge Tables and columns. The Provider and Providermail are merged. UINQUE constraint is attached to ProvEmail.

Plot (PatNo, PatAge, PatZip9)

FOREIGN KEY (PatZip9) REFERENCES Plotmail

Plotmal (PatZip9, PatCity)

Visit (VisitNo, VisitDate, PatNo)

FOREIGN KEY (PatNo) REFERENCES Plot

Provider (ProvNo, ProvSpeciality, ProvEmail)

UNIQUE (ProvEmail)

FOREIGN KEY (ProvEmail) REFERENCES Providermail

Number (VisitNo, ProvNo, Diagnosis)

FOREIGN KEY (VisitNo) REFERENCES Visit

FOREIGN KEY (ProvNo) REFERENCES Provider

Problem 3

Lender table follows BCNF rules. LenderNo is unique and gives values for LenderName.

Institution table also foolws BCNF rules, no need for splitting.

Student table doesnot follow BCNF because, StdZip StdCity, StdState. So, we need to split the Student table into two tables

Student (StdNo, StdName, StdEmail, StdAddress) and

Address (StdZip, StdCity, StdState).

Problem 4

FD’s with OrderNo as the determinant.

OrdNo ItemNo (1,2) (3,4)

OrdNo QtyOrd (3,4)

OrdNo CustNo No falsification

OrdNo CustBal No falsification

OrdNo CustDisc No falsification

OrdNo ItemPrice (1,2) (3,4)

OrdNo OrdDate No falsification