Assignment for Module 11

The assignment for Module 11 involves problems for falsifying functional dependencies, converting ERDs to table designs, and applying the rules of normalization.

1. Requirements for Data Modeling Problems

1. You should identify insertion, update, and deletion anomalies in the sample rows of the big patient table shown in Table 1. You should identify one example of each type of anomaly. Each example should have sufficient specificity for the sample rows in the table. The combination of *VisitNo* and *ProvNo* is the only unique column(s) for the table.

Table 1: Sample Rows for the Big Patient Table

VisitNo	**VisitDate**	**PatNo**	**PatAge**	**PatCity**	**PatZip**	**ProvNo**	**ProvSpecialty**	**Diagnosis**
V10021	2/13/2021	P1	36	DENVER	80217	D1	INTERNIST	EAR INFECTION
V10021	2/13/2021	P1	36	DENVER	80217	D2	NURSE PRACTITIONER	INFLUENZA
V93030	2/20/2021	P3	17	ENGLEWOOD	80113	D2	NURSE PRACTITIONER	PREGNANCY
V82110	2/18/2021	P2	60	BOULDER	85932	D3	CARDIOLOGIST	MURMUR

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

ProvEmail → ProvNo

3. You should determine if the *Student*, *Lender*, and *Institution* tables are in BCNF. In the *Lender* table, *LenderName* is unique. In the *Institution* table, *InstName* is unique. In the *Student* table, *StdEmail* is unique. The primary key of each table is underlined. The primary key of each table is underlined. You should explain your decision and modify the table design by splitting tables or adding constraints if necessary.

   Student (StdNo, StdName, StdEmail, StdAddress, StdCity, StdState, StdZip)

   Lender(LenderNo, LenderName)

   Institution(InstNo, InstName, InstMascot)

4. For the big order database table in Table 3, you should list FDs with the column *OrdNo* as the determinant. For each FD, you should identify at least one pair of sample rows that falsify it or indicate that no falsification example exists for the FD. Remember that it takes two rows to falsify an FD in which the LHS is the same in both rows, but the RHS is different in both rows.

Table 3: Sample Rows for the Big Order Database Table

OrdNo	**ItemNo**	**QtyOrd**	**CustNo**	**CustBal**	**CustDisc**	**ItemPrice**	**OrdDate**
O1	I1	10	C1	100	0.10	10	1/15/2021
O1	I2	10	C1	100	0.10	20	1/15/2021
O2	I3	5	C2	200	0.05	30	1/16/2021
O2	I4	10	C2	200	0.05	40	1/16/2021
O3	I1	10	C1	100	0.10	10	1/17/2021

2. Submission Requirements

The submission requirements involve evidence that you applied normalization concepts correctly on each problem. Place solutions for each problem in the same document with clear labels for each problem.