

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)

Answer:

- The student table is not in BCNF because $\text{StdZip} \rightarrow \text{StdAddress}, \text{StdCity}, \text{StdState}$
- Split the Student table into 2 tables, with StdAddress, StdCity, StdState, StdZip as attributes, and StdZip as primary key in the new StudentZip table and foreign key in Student table.
- A UNIQUE constraint for StdEmail as $\text{StdEmail} \rightarrow \text{StdNo}$

Lender(LenderNo, LenderName)

- A UNIQUE constraint for LenderName as $\text{LenderName} \rightarrow \text{LenderNo}$

Institution(InstNo, InstName, InstMascot)

- A UNIQUE constraint for InstName as $\text{InstName} \rightarrow \text{InstNo}$