MODULE 4 ASSIGNMENT 1

CREATING RELATIONS IN 3NF FROM AN ENTITY RELATIONSHIP DIAGRAM (ERD)

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1. **Identify all partial dependencies.**

   - The composite keys INV_NUMBER and LINE_NUMBER functionally determine the attributes LINE_UNITS and LINE_PRICE, but they are only determined by LINE_NUMBER. This may produce a partial dependency.

2. **Identify all transitive dependencies.**

   - CUS_CODE functionally determines the attributes CUS_AREACODE and CUS_CODE, but these can also be candidate keys. This may produce transitive dependencies to other customers. However, these will not cause insert/delete/update anomalies.
   - INV_NUMBER functionally determines the attribute CUS_DATE but CUS_DATE is also dependent on CUS_CODE. This may produce a transitive dependency.
   - V_CODE functionally determines V_AREACODE, V_PHONE, and V_CONTACT, but these can also be candidate keys. This may produce transitive dependencies with other VENDOR attributes.

3. **Create relations in 3NF that represent the given Crow's Foot ERD.**

   There are five entities that need to be represented by relations (CUSTOMER, INVOICE, LINE, PRODUCT, and VENDOR). There are four relationships that have different cardinalities.

   - The CUSTOMER entity has a zero-to-many relationship with INVOICE.
   - The INVOICE entity has a zero-to-many relationship with LINE.
   - The PRODUCT entity has a zero-to-many relationship with LINE.
   - The PRODUCT entity has a zero-to-many relationship with VENDOR.

4. **List the primary keys and the foreign keys associated with the given relations.**

   Below are the primary keys (PK) and foreign keys (FK) associated with each relation:

   CUSTOMER
   PK: CUS_CODE

   INVOICE
   PK: INV_NUMBER

   LINE
   PK: INV_NUMBER, LINE_NUMBER
   FK: INV_NUMBER, P_CODE

   PRODUCT
   PK: P_CODE
   FK: V_CODE

   VENDOR
   PK: V_CODE