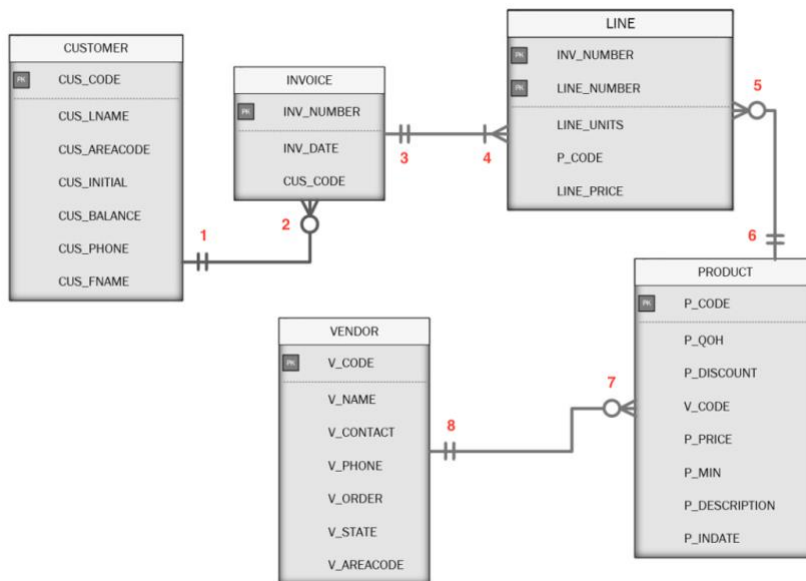


Gurjus Singh

MSDS 420 – DATABASE SYSTEMS

EXERCISE 2: ER DIAGRAMS



1. Based on the Crow's Foot ERD below: a) discuss the entities (5 points) for each entity, b) discuss the attributes (5 points), c) the relationship cardinalities (5 points) and d) the primary and foreign keys (5 points).

ANSWER:

A.) The entities in the diagram include:

- CUSTOMER
- INVOICE
- LINE
- VENDOR
- PRODUCT

B.) The attributes for CUSTOMER are:

- CUS_CODE

- CUS_LNAME
- CUS_AREACODE
- CUS_INITIAL
- CUS_BALANCE
- CUS_PHONE
- CUS_FNAME

The attributes for INVOICE are:

- INV_NUMBER
- INV_DATE
- CUS_CODE

The attributes for LINE are:

- INV_NAME
- LINE_NUMBER
- LINE_UNITS
- P_CODE
- LINE_PRICE

The attributes for VENDOR are:

- V_CODE
- V_NAME
- V_CONTACT
- V_PHONE
- V_ORDER
- V_STATE
- V_AREACODE

The attributes for PRODUCT are:

- P_CODE
- P_QQH
- P_DISCOUNT
- V_CODE
- P_PRICE
- P_MIN
- P_DESCRIPTION

- P_INDATE

C.) The relationship between CUSTOMER entity and INVOICE entity is a one to many where INVOICE has optional participation and there is a one and only one relationship between INVOICE and CUSTOMER.

The relationship between INVOICE entity and LINE entity is a one to many where each entity has mandatory participation and there is a one and only one relationship between LINE and INVOICE.

The relationship between LINE entity and PRODUCT entity is a many to many where LINE has optional participation and there is a one and only relationship between LINE and PRODUCT.

The relationship between VENDOR entity and PRODUCT entity is a many to many where PRODUCT has optional participation and there is one and only one relationship between PRODUCT and VENDOR.

D.) CUSTOMER entity has CUS_CODE as its primary key, and no foreign keys

INVOICE entity has INV_NUMBER as its primary key and CUS_CODE as its foreign key.

LINE entity has two primary keys in INV_NUMBER and LINE_NUMBER which make up a composite key, and INV_NUMBER is also a foreign key since it is a primary/candidate key of the INVOICE entity.

VENDOR entity has one primary key in V_CODE and no foreign keys.

PRODUCT entity has one primary key P_CODE and V_CODE as its foreign key.

2.) Write the business rules that are reflected in the following Crow's Foot ERD (10 points).
An example of a business rule in the given ERD: ***Every customer can have many invoices.***

ANSWER:

A CUSTOMER has zero or more INVOICES. An INVOICE belongs to one and only CUSTOMER.

An INVOICE has one or more LINES. A LINE belongs to one and only one INVOICE.

Zero or more LINES contain details on one and only one PRODUCT. A PRODUCT entity is contained in zero or more LINES.

A VENDOR sells zero or more PRODUCTS. A PRODUCT is sold by one and only one VENDOR.