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IT667 - Database Management Systems

Lab Assignment 3 - Understanding Basics of Database Design

Create the following tables with the given columns and relevant datatypes:

Customers (Customer_ID, Name, Address, City, Region, Postal_Code, Country, Email_Address),

Products (Product_ID, Product_Name, Unit_Price, Units_In_Stock, Units_On_Order, Quantity_Per_Unit),

Suppliers (Supplier_ID, Company_Name, Contact_Person, Address, City, Region, Postal_Code, Country, Phone_Number) and

Orders (Order_ID, Salesperson, Order_Date, Product, Quantity, Price)

```
CREATE TABLE CUSTOMER(
    CUSTOMER_ID NUMERIC,
    CUSTOMER_NAME VARCHAR(50),
    CUSTOMER_ADRESS VARCHAR(50),
    CUSTOMER_CITY VARCHAR(50),
    CUSTOMER_REGION VARCHAR(50),
    CUSTOMER_POSTALCODE NUMERIC,
    CUSTOMER_COUNTRY VARCHAR(50),
    CUSTOMER_EMAIL VARCHAR(50),
    CONSTRAINT CUSTOMER_PK PRIMARY KEY (CUSTOMER_ID)
    );
```

```
CREATE TABLE PRODUCTS(
    PRODUCT_ID NUMERIC,
    PRODUCT_NAME VARCHAR(50),
    UNIT_PRICE NUMERIC,
    UNITS_IN_STOCK NUMERIC,
    UNITS_ON_ORDER NUMERIC,
    QUANTITY_PER_UNIT NUMERIC,
    SUPPLIER_ID NUMERIC,
    CONSTRAINT PRODUCTS_PK PRIMARY KEY (PRODUCT_ID)
    );

CREATE TABLE SUPPLIERS(
    SUPPLIER_ID NUMERIC,
    COMPANY_NAME VARCHAR(50),
    CONTACT_PERSON VARCHAR(50),
    SUPPLIERS_ADDRESS VARCHAR(50),
    SUPPLIERS_CITY VARCHAR(50),
    SUPPLIERS_REGION VARCHAR(50),
    POSTAL_CODE NUMERIC,
    COUNTRY VARCHAR(50),
    PHONE_NUMBER NUMERIC,
    CONSTRAINT SUPPLIERS_PK PRIMARY KEY (SUPPLIER_ID)
    );
```

```
CREATE TABLE ORDERS(
    ORDER_ID NUMERIC,
    SALES_PERSON VARCHAR(50),
    ORDER_DATE NUMERIC,
    PRODUCT VARCHAR(50),
    QUANTITY NUMERIC,
    PRICE NUMERIC,
    CONSTRAINT ORDERS_PK PRIMARY KEY (ORDER_ID)
    );
```

1. Define Super Key and Identify the set of Super Keys from the given tables.

ANSWER:

Super Key : Set of one or more attributes which taken collectively identifies uniquely an
entity in entity set. We can define a super key as a set of those keys that identify a row or a tuple uniquely.
Example - Emp_id , Emp_name , Emp_email

The set of Super keys from given table:

TABLE NAME	SET OF SUPER KEYS

CUSTOMER	1.(CUSTOMER_ID) 2(CUSTOMER_ID),(CUSTOMER_ADRESS) 3.(CUSTOMER_ID,CUSTOMER_NAME)
PRODUCTS	1.(PRODUCT_ID) 2.(PRODUCT_ID,PRODUCT_NAME) 3.(PRODUCT_IT ,UNIT_PRICE)
SUPPLIERS	1.(SUPPLIER_ID) 2.(SUPPLIER_ID,Company_Name) 3.(SUPPLIER _ID) 4.(SUPPLIER_ID,CONTACT_PERSON)
ORDERS	1.(ORDER_ID) 2.(ORDER_ID,SALESPERSON), 3 .(ORDER_ID,PRODUCT,ORDER_DATE)

2. Define Candidate Key and Identify the eligible Candidate Keys for the given tables.

ANSWER:

DEFINATION:

The minimum set of attribution that can uniquely identifies the tuple or table is called Candidate key.For example - CUSTOMER_ID , CUSTOMER_EMAIL in CUSTOMER table.

The eligible Candidate Keys for the given tables

TABLE NAME	CANDIDATE KEYS
CUSTOMER	(CUSTOMER_ID), (CUSTOMER_EMAIL)
PRODUCTS	(PRODUCT_ID),
SUPPLIERS	(SUPPLIER_ID),(PHONE_NUMBER)
ORDERS	(ORDER_ID)

3. What is a primary key? Identify the column from the given tables, which can be the primary key for that respective table.

DEFINATION: There can be more than one candidate key in the relation out of which one can be chosen as the primary key .For example STUD_ID ,STUD_PHONE are the candidate keys for relation STUDENT but STUD_NO can be chosen as the primary key(only one out of many candidates).

- It is a unique key .
- It can identify only one tuple at a time.
- It has no duplicate values , it has unique values.
- It cannot be null.

The primary keys for that respective table are:

TABLE NAME	PRIMARY KEY

CUSTOMER	(CUSTOMER_ID)
PRODUCTS	(PRODUCT_ID)
SUPPLIERS	(SUPPLIER_ID)
ORDERS	(ORDER_ID)

4. Modify the Products Table to identify from which supplier the particular product is received. Based on your modification, explain the concept of Foreign Key and elaborate your modification briefly.

INPUT:

```
ALTER TABLE PRODUCTS
ADD CONSTRAINT SUPPLIER_FK
FOREIGN KEY (SUPPLIER_ID)
REFERENCES SUPPLIERS(SUPPLIER_ID);
```

OUTPUT:

```
Table altered.
```

FOREIGN KEY - Foreign key in relational database is a field in one table ,that is used to refer **primary keys** of another table.

We have added **SUPPLIER_ID** attribute to the table **PRODUCTS** as foreign key with reference to **SUPPLIERS** table. **SUPPLIER_ID** is primary key of table **SUPPLIERS**.