

Solutions to Extra Problems for Module 3

1. Write a CREATE TABLE statement for the *Customer* table. Choose data types appropriate using standard SQL data types where possible. Note that the *CustBal* column contains numeric data. The currency symbols are not stored in the database. The *CustFirstName* and *CustLastName* columns are required (not null).
2. Write a CREATE TABLE statement for the *Employee* table. Choose data types appropriate using standard SQL data types where possible. The *EmpFirstName*, *EmpLastName*, and *EmpEMail* columns are required (not null).
3. Write a CREATE TABLE statement for the *OrderTbl* table. Choose data types appropriate using standard SQL data types where possible. The *OrdDate* column is required (not null).
4. Identify the foreign keys and 1-M relationships among the *Customer*, *Employee*, and *OrderTbl* tables. For each relationship, identify the parent table and the child table.
5. Extend your CREATE TABLE statement from problem (3) with referential integrity constraints.
6. From examination of the sample data and your common understanding of order entry businesses, are null values allowed for the foreign keys in the *OrderTbl* table? Why or why not? Extend the CREATE TABLE statement in problem (5) to enforce the null value constraints if any.
7. Extend your CREATE TABLE statement for the *Employee* table (problem 2) with a unique constraint for *EmpEMail*. Use a named constraint clause for the unique constraint.
8. In the data type for *OrdDate* from problem 3, what would the data type be in Oracle and PostgreSQL if the column stores both date and time values such as 10-Jul-2022 11:55AM?

The CREATE TABLE statement solutions uses standard SQL data types supported by PostgreSQL and Oracle except where noted.

1.

Oracle and PostgreSQL

```
CREATE TABLE Customer
( CustNo      CHAR(8),
  CustFirstName VARCHAR(20) CONSTRAINT CustFirstNameRequired NOT NULL,
  CustLastName VARCHAR(30) CONSTRAINT CustLastNameRequired NOT NULL,
  CustCity     VARCHAR(30),
  CustState    CHAR(2),
  CustZip      CHAR(10),
  CustBal      DECIMAL(12,2),
  CONSTRAINT PKCustomer PRIMARY KEY (CustNo) );
```

2.

Oracle and PostgreSQL

```
CREATE TABLE Employee
( EmpNo      CHAR(8),
  EmpFirstName VARCHAR(20) CONSTRAINT EmpFirstNameRequired NOT NULL,
  EmpLastName VARCHAR(30) CONSTRAINT EmpLastNameRequired NOT NULL,
  EmpPhone    CHAR(15),
  EmpEmail    VARCHAR2(50) CONSTRAINT EmpEmailRequired NOT NULL,
  CONSTRAINT PKEmployee PRIMARY KEY (EmpNo) );
```

3.

Oracle

```
CREATE TABLE OrderTbl
( OrdNo      CHAR(8),
  OrdDate     DATE CONSTRAINT OrdDateRequired NOT NULL,
  CustNo      CHAR(8),
  EmpNo       CHAR(8),
  CONSTRAINT PKOrderTbl PRIMARY KEY (OrdNo) );
```

PostgreSQL

```
CREATE TABLE OrderTbl
( OrdNo      CHAR(8),
  OrdDate     DATE CONSTRAINT OrdDateRequired NOT NULL,
  CustNo      CHAR(8),
  EmpNo       CHAR(8),
  CONSTRAINT PKOrderTbl PRIMARY KEY (OrdNo) );
```

4.

There are two 1-M relationships: (1) Customer (CustNo PK) – OrderTbl (CustNo FK) and (2) Employee (EmpNo PK) – OrderTbl (EmpNo FK).

5.

The CREATE TABLE statement has been extended with foreign keys for *CustNo* and *EmpNo*.

Oracle

```
CREATE TABLE OrderTbl
( OrdNo      CHAR(8),
  OrdDate    DATE CONSTRAINT OrdDateRequired NOT NULL,
  CustNo     CHAR(8),
  EmpNo      CHAR(8),
  CONSTRAINT PKOrderTbl PRIMARY KEY (OrdNo) ,
  CONSTRAINT FK_CustNo FOREIGN KEY (CustNo) REFERENCES Customer,
  CONSTRAINT FK_EmpNo FOREIGN KEY (EmpNo) REFERENCES Employee
);
```

```
CREATE TABLE OrderTbl
( OrdNo      CHAR(8),
  OrdDate    DATE NOT NULL,
  CustNo     CHAR(8),
  EmpNo      CHAR(8),
  CONSTRAINT PKOrderTbl PRIMARY KEY (OrdNo) ,
  CONSTRAINT FK_CustNo FOREIGN KEY (CustNo) REFERENCES Customer (CustNo),
  CONSTRAINT FK_EmpNo FOREIGN KEY (EmpNo) REFERENCES Employee (EmpNo)
);
```

6.

Null values are not allowed for *CustNo*. The sample data shows that each order has a related customer. In addition, common practice indicates that an order requires a customer. Fraud could result if orders are stored without a related customer. Null values are allowed for the *EmpNo* column. The sample data shows rows without an *EmpNo* value. The null values may correspond to internet orders where no employee takes the order.

```
CREATE TABLE OrderTbl
( OrdNo      CHAR(8),
  OrdDate    DATE CONSTRAINT OrdDateRequired NOT NULL,
  CustNo     CHAR(8) CONSTRAINT CustNoRequired NOT NULL,
  EmpNo      CHAR(8),
  CONSTRAINT PKOrderTbl PRIMARY KEY (OrdNo) ,
  CONSTRAINT FK_CustNo FOREIGN KEY (CustNo) REFERENCES Customer,
  CONSTRAINT FK_EmpNo FOREIGN KEY (EmpNo) REFERENCES Employee
);
```

7.

```
CREATE TABLE Employee
( EmpNo      CHAR(8),
  EmpFirstName VARCHAR2(20) CONSTRAINT EmpFirstNameRequired NOT NULL,
  EmpLastName VARCHAR2(30) CONSTRAINT EmpLastNameRequired NOT NULL,
  EmpPhone    CHAR(15),
  EmpEmail    VARCHAR(50) CONSTRAINT EmpEmailRequired NOT NULL,
  CONSTRAINT PKEmployee PRIMARY KEY (EmpNo),
  CONSTRAINT UniqueEMail UNIQUE (EmpEmail) );
```

8.

In Oracle, you should use the DATE data type. In PostgreSQL, you should use the TIMESTAMP data type. The DATE data type in PostgreSQL does not store time as part of a value. TIMESTAMP stores both date and time values. In Oracle, the DATE data type stores both date and time values.