**A. Relational Model Implementation**

A furniture company has data pertaining to Customers, Orders, Products, and Requests, as shown below.

**CUSTOMERS:**

**CUSTOMERID             NAME                           ADDRESS**

**---------------------- ------------------------------ --------------------**

**2                      CASUAL FURNITURE               PLANO, TX**

**6                      MOUNTAIN GALLERY               BOULDER, CO**

**ORDERS:**

**ORDERID                ORDERDATE                 CUSTOMERID**

**---------------------- ------------------------- ----------------------**

**1006                   24-MAR-10                 2**

**1007                   25-MAR-10                 6**

**1008                   25-MAR-10                 6**

**1009                   26-MAR-10                 2**

**PRODUCTS:**

**PRODUCTID              DESCRIPTION                    FINISH     PRICE**

**---------------------- ------------------------------ ---------- ----------**

**10                     WRITING DESK                   OAK        425**

**30                     DINING TABLE                   ASH        NULL**

**40                     ENTERTAINMENT CENTER           MAPLE      650**

**70                     CHILDRENS DRESSER              PINE       300**

**REQUESTS:**

**ORDERID                PRODUCTID              QUANTITY**

**---------------------- ---------------------- ----------------------**

**1006                   10                     4**

**1006                   30                     2**

**1006                   40                     1**

**1007                   40                     3**

**1007                   70                     2**

**1008                   70                     1**

**1009                   10                     2**

**1009                   40                     1**

1. Create a relational database schema for the furniture company.  Define all necessary attributes, domains, and primary and foreign keys.

You should assume the following:

(i) each CustomerID is a number with at most three digits,

(ii) each OrderID is a number with at most five digits,

(iii) each ProductID is a number with at most two digits,

(iv) each Name is at most 25 characters long,

(v) each Address is at most 50 characters long.

(vi) each Description is at most 28 characters long,

(vii) each Finish is at most 10 characters long, and

(viii) Quantity and Price are integer and float respectively.

2. Include the following custom constraints in your schema:

* Each Price is a non-negative value (zero is allowed) representing a price in dollars and cents that cannot exceed 899.99.
* Each Quantity is a positive whole number between 1 and 50, inclusive.

3. Write insert statements to insert the data.

Note: Remember to insert the records containing primary key values before inserting the records containing the foreign keys that reference those values (or your insert statements will fail).

4. Display the contents of each table by adding four statements of the form SELECT \* FROM *TABLE\_NAME*;  to the end of your script, where TABLE\_NAME is substituted by the four table names above.

In order to avoid conflicts, also include DROP TABLE commands for all four tables.  Decide where to place DROP TABLE commands: before or after Create Table commands. Remember to drop tables in the correct order.

Run the complete script.  Be sure that after the execution, the contents of the tables are displayed by your script.

**Submit A.sql**

**B. Primary Key**

Consider the following table declaration:

Create Table Location (

       latitude float,

       longitude float,

       name varchar(50)

);

1. What would be an appropriate primary key for this relation?
2. Based on your primary key provide insert statements for this relation, based on the following data:

(41.881832, -87.623177, 'Chicago');

(42.881832, -87.623177,'Chicago');

(41.881832, -86.623177,'Chicago')

(iii) Do any of the statements result in a violation? If yes, why? If no, why?

**Submit B.sql. Write your responses as a comment instead of using Word or PDF**

**C. Altering Schemas**

The Cars table has the following specification.

CREATE TABLE Cars (

CarID number(5) primary key,

VIN number(10) UNIQUE,

Color char(15),

YearofMake number(4),

Model\_id number(5),

foreign key model\_id references Models(model\_id)

);

It has the following data:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| CarId | VIN | Color | YearOfMake | Model\_id |
| 123 | 3456783412 | Red | 2010 | 1 |
| 234 | 2876309034 | Blue | 2003 | 2 |

The Model table has the following specification:

CREATE TABLE Models (

model\_id number(5) primary key,

modelBrand varchar(15),

modelName varchar(15) );

It has the following data:

|  |  |  |
| --- | --- | --- |
| model\_id | Brand | Make |
| 1 | Toyota | Camry |
| 2 | Toyota | Corolla |

(i) A user tried to make the following Insert statement: INSERT INTO Cars VALUES (235, 3456783412, 'Silver', 2010, 1);

The student received a constraint violation error.  Report the error from SQL Developer and explain the error in your own words.

(ii) A user tried to make the following Delete statement: DELETE FROM Model;

The student received a constraint violation error. Report the error from SQL Developer and explain in your own words.

(ii) Given the knowledge about the errors in (i) and (ii), as a DB Designer you wish to relax the  the schema of Cars and Model, such that the insert and delete statements are executed without an error. Use **Alter statements** to modify the table and relax the constraints.

Note: in (iii) you must use Alter statements otherwise no points will be awarded.

**Submit C.sql**

**D. Referential Integrity**

When asked to create an Employee database, a DBA was given the schema

Emps(empID, ssNo, name, mgrID)

with the statement "All managers are employees". Write the  Create Table statement for the Emps relation.

Note: Only one table must be created. A foreign key can self-reference a table.

**Submit D.sql**