

Q1. Create a Data Dictionary for the TPAG scenario.

Ans:

Data Dictionary								
Table Name	Attribute Name	Contents	Type	Format	Range	Required	PK or FK	FK Referenced Table
Customer	CustomerID	Customer Identification Number and account number	TEXT	XXX00000	XXX000000-XXX9999999	Y	PK	
	Cus_FName	First Name	VARCHAR(20)	Xxxxxxx	Variable length with maximum 20 characters	Y		
	Cus_MName	Middle Name	VARCHAR(15)	Xxxxxxx				
	Cus_LName	Last Name	VARCHAR(15)	Xxxxxxx		Y		
	Billing_Street	Billing Address-Street Number and name	VARCHAR(100)	1807 Harlequin Pl		Y		
	Billing_Apt	Billing Address-Apartment or unit number	VARCHAR(20)	Villa 30		Y		
	Billing_City	Billing Address- City name	VARCHAR(50)	Allen		Y		
	Billing_State	Billing Address- State (as abbreviations)	VARCHAR(5)	TX		Y		
	Billing_Zip	Billing Address-Zip Code	VARCHAR(10)	75003		Y		
	Cus_Phone	Customer phone/contact number	VARCHAR(15)	+1(469)3018444				
	Cus_Email	Customer email address	VARCHAR(50)	Xxx@gmail.com		Y		
Orders	OrderID	Unique number for each generated order	INT	45678	00000-99999	Y	PK	
	CustomerID	Customer Identification Number and account number	TEXT	XXX00000	XXX000000-XXX9999999	Y	FK	Customer
	SalesRepID	ID for a sales representative	INT	1002111	1000000-1009999	Y	FK	SalesRep
	ShipmentID	Identification number for a shipment	INT	7777777	0000000-9999999	Y	FK	Shipment
	Order_Date	The date on which an order is placed	TEXT	YYYY-MM-DD		Y		
	Ord_Amount	Total amount of the order placed	DECIMAL(10,2)	100.91	The maximum value that can be stored is 9999999.99	Y		
ArtWorks	ArtID	Each type of Artwork is identified by an Item Code	VARCHAR(20)	XXX012345	XXX000000-XXX999999	Y	PK	
	Art_Des	Description of the Artwork- size, weight type etc.	VARCHAR(100)			Y		
	Art_Price	Price of each Artwork	DECIMAL(10,2)	100.91	The maximum value that can be stored is 9999999.99	Y		
	Art_Qty	The quantity of each Artwork in stock	INT	566		Y		
Vehicle	VehicleID	Identify code/number for each vehicle assigned by TPAG	VARCHAR(15)	XXX-0101	XXX-0000 to XXX-9999	Y	PK	
	DriverID	Unique number to identify each diver.	INT	1002133	1000000-1009999	Y	FK	Driver
	VLICENSE_No	License plate number of each vehicle	VARCHAR(10)	XXX-1234		Y		
	VLICENSE_Exp	Expiration date of license of a vehicle	TEXT	YYYY-MM-DD		Y		
	Inspection_Exp	Expiration date of last inspection of a vehicle	TEXT	YYYY-MM-DD		Y		
Shipment	ShipmentID	Identification number for a shipment	INT	456789	000000-9999999	Y	PK	
	OrderID	Unique number for each generated order	INT	45678	00000-99999	Y	FK	Orders
	Del_Street	Delivery Address-Street Number and name	VARCHAR(100)	1807 Harlequin Pl		Y		
	Del_Apt	Delivery Address-Apartment or unit number	VARCHAR(20)	Villa 30		Y		
	Del_City	Delivery Address- City name	VARCHAR(50)	Allen		Y		
	Del_State	Delivery Address- State	VARCHAR(5)	TX		Y		
	Del_Zip	Delivery Address-Zip Code	VARCHAR(10)	75003		Y		
	Del_Date	Due date the shipment to be delivered	TEXT	YYYY-MM-DD		Y		
	VehicleID	Each vehicle has a number assigned by TPAG	VARCHAR(15)	XXX-0101		Y	FK	Vehicle
	EmployeeID	Unique number to identify each employee	INT	1002133	1000000-1009999	Y	PK	
Employee	SSN	Social Security Number	VARCHAR(11)	123-11-1234		Y		
	Emp_FName	Employee first name	VARCHAR(20)	Xxxxxxx		Y		
	Emp_MName	Employee middle name	VARCHAR(15)	Xxxxxxx				
	Emp_LName	Employee last name	VARCHAR(15)	Xxxxxxx		Y		
	DoB	Employee date of birth	TEXT	YYYY-MM-DD		Y		
	Emp_Type	Employee type (driver or sales representative)	VARCHAR(25)	Driver/ Sales Representative		Y		
	Emp_Salary	Employee monthly salary	DECIMAL(10,2)	1234.99	The maximum value that can be stored is 9999999.99	Y		
	Emp_Street	Employee residence address	VARCHAR(100)	1807 Harlequin Pl		Y		
	Emp_Apt	Employee residence address	VARCHAR(20)	Villa 30		Y		
	Emp_City	Employee residence address -city	VARCHAR(50)	Allen		Y		
	Emp_State	Employee residence address-state	VARCHAR(5)	TX		Y		
	Emp_Zip	Employee residence address- zip code	VARCHAR(10)	75003		Y		
	Emp_Phone	Employee contact number	VARCHAR(15)	+1(469)3018444		Y		
SalesRep	SalesRepID	Employee Id that representing a sales representative	INT	1002111	1000000-1009999	Y	PK and FK	Employee
	Commission	Commission for a sales representative on processing order	DECIMAL(10,2)	234.32	The maximum value that can be stored is 9999999.99			
Driver	DriverID	Unique number to identify each diver. This DriverID is also the employee id for the driver as part of the Employee entity.	INT	1002133	1000000-1009999	Y	PK and FK	Employee
	DL_No	The valid driving license number	VARCHAR(20)	12345678		Y		
	DL_Exp_Date	The expiration date of the driving license	TEXT	YYYY-MM-DD		Y		
	VehicleID	The vehicle number assigned to the driver	VARCHAR(15)	XXX-0101	XXX-0000 to XXX-9999	Y	FK	Vehicle
Assign	OrderID	Unique number for each generated order	INT	45678	00000-99999	Y	PK and FK	Orders
	ArtID	Each type of Artwork is identified by an Item Code	VARCHAR(20)	XXX012345	XXX000000-XXX9999999	Y	PK and FK	ArtWorks
	Qty_Ordered	Quantity of the Items ordered associated with each order	INT	32		Y		
PK	Primary Key							
FK	Foreign Key							
TEXT	Represents variable-length character strings							
VARCHAR	Variable character length data (1-2000 characters)							
INTEGER	Used for whole numbers, both positive and negative.							
DECIMAL	Stores numbers with a maximum of 10 digits in total, including 2 decimal places to the right of the decimal point.							
TEXT	Used to define dates							

Q2. Create Tables in SQLite Database

Ans:

Creating Database Assignment_4.db and Tables:

```
Microsoft Windows [Version 10.0.22621.1702]
(c) Microsoft Corporation. All rights reserved.

C:\Users\samih>cd Downloads

C:\Users\samih\Downloads>cd Dbms

C:\Users\samih\Downloads\Dbms>sqlite3
SQLite version 3.42.0 2023-05-16 12:36:15
Enter ".help" for usage hints.
Connected to a transient in-memory database.
Use ".open FILENAME" to reopen on a persistent database.
sqlite> .quit

C:\Users\samih\Downloads\Dbms>sqlite3 Assignment_4.db
SQLite version 3.42.0 2023-05-16 12:36:15
Enter ".help" for usage hints.
sqlite> CREATE TABLE Customer (
(x1...> CustomerID TEXT PRIMARY KEY NOT NULL,
(x1...> Cus_FName VARCHAR(20) NOT NULL,
(x1...> Cus_MName VARCHAR(15),
(x1...> Cus_LName VARCHAR(15) NOT NULL,
(x1...> Billing_Street VARCHAR(100) NOT NULL,
(x1...> Billing_Apt VARCHAR(50) NOT NULL,
(x1...> Billing_City VARCHAR(50) NOT NULL,
(x1...> Billing_State VARCHAR(5) NOT NULL,
(x1...> Billing_Zip VARCHAR(10) NOT NULL,
(x1...> Cus_Phone VARCHAR(15),
(x1...> Cus_Email VARCHAR(50) NOT NULL
```

```

sqlite> CREATE TABLE Employee (
(x1...> EmployeeID INT PRIMARY KEY NOT NULL,
(x1...> SSN VARCHAR(11) NOT NULL,
(x1...> Emp_FName VARCHAR(20) NOT NULL,
(x1...> Emp_MName VARCHAR(15),
(x1...> Emp_LName VARCHAR(15) NOT NULL,
(x1...> DoB TEXT NOT NULL,
(x1...> Emp_Type VARCHAR(25) NOT NULL,
(x1...> Emp_Salary DECIMAL(10,2) NOT NULL,
(x1...> Emp_Street VARCHAR(100) NOT NULL,
(x1...> Emp_Apt VARCHAR(20) NOT NULL,
(x1...> Emp_City VARCHAR(50) NOT NULL,
(x1...> Emp_State VARCHAR(5) NOT NULL,
(x1...> Emp_Zip VARCHAR(10) NOT NULL,
(x1...> Emp_Phone VARCHAR(15) NOT NULL
(x1...> );

```

```

sqlite> CREATE TABLE ArtWorks (
(x1...> ArtID VARCHAR(20) PRIMARY KEY NOT NULL,
(x1...> Art_Des VARCHAR(100) NOT NULL,
(x1...> Art_Price DECIMAL(10,2) NOT NULL,
(x1...> Art_Qty INTEGER NOT NULL
(x1...> );

```

```

sqlite> CREATE TABLE Orders (
(x1...> OrderID INTEGER PRIMARY KEY NOT NULL,
(x1...> CustomerID TEXT NOT NULL,
(x1...> SalesRepID INTEGER NOT NULL,
(x1...> ShipmentID INTEGER NOT NULL,
(x1...> Order_Date TEXT NOT NULL,
(x1...> Order_Amount DECIMAL(10,2),
(x1...> FOREIGN KEY (CustomerID) REFERENCES Customer (CustomerID) ON DELETE CASCADE ON UPDATE CASCADE,
(x1...> FOREIGN KEY (SalesRepID) REFERENCES SalesRep (SalesRepID) ON DELETE CASCADE ON UPDATE CASCADE,
(x1...> FOREIGN KEY (ShipmentID) REFERENCES Shipment (ShipmentID) ON DELETE CASCADE ON UPDATE CASCADE
(x1...> );

```

```

sqlite> CREATE TABLE Vehicle (
(x1...> VehicleID VARCHAR(15) PRIMARY KEY NOT NULL,
(x1...> DriverID INTEGER NOT NULL,
(x1...> VLicense_No VARCHAR(10) NOT NULL,
(x1...> VLicense_Exp TEXT NOT NULL,
(x1...> Inspection_Exp TEXT NOT NULL,
(x1...> FOREIGN KEY (DriverID) REFERENCES Driver (DriverID) ON DELETE CASCADE ON UPDATE CASCADE
(x1...> );

```

```

sqlite> CREATE TABLE Shipment (
(x1...> ShipmentID INTEGER PRIMARY KEY NOT NULL,
(x1...> OrderID INTEGER NOT NULL,
(x1...> VehicleID VARCHAR(15) NOT NULL,
(x1...> Del_Street VARCHAR(100) NOT NULL,
(x1...> Del_Apt VARCHAR(20) NOT NULL,
(x1...> Del_City VARCHAR(50) NOT NULL,
(x1...> Del_State VARCHAR(5) NOT NULL,
(x1...> Del_Zip VARCHAR(10) NOT NULL,
(x1...> Del_Date TEXT NOT NULL,
(x1...> FOREIGN KEY (OrderID) REFERENCES Orders (OrderID) ON DELETE CASCADE ON UPDATE CASCADE,
(x1...> FOREIGN KEY (VehicleID) REFERENCES Vehicle (VehicleID) ON DELETE CASCADE ON UPDATE CASCADE
(x1...> );

```

```

sqlite> CREATE TABLE SalesRep (
(x1...> SalesRepID INT PRIMARY KEY NOT NULL,
(x1...> Commission DECIMAL(10,2) NOT NULL,
(x1...> FOREIGN KEY (SalesRepID) REFERENCES Employee (SalesRepID) ON DELETE CASCADE ON UPDATE CASCADE
(x1...> );

```

```

sqlite> CREATE TABLE Driver (
(x1...> DriverID INT PRIMARY KEY NOT NULL,
(x1...> VehicleID VARCHAR(15) NOT NULL,
(x1...> DL_No VARCHAR(20) NOT NULL,
(x1...> DL_Exp_Date TEXT NOT NULL,
(x1...> FOREIGN KEY (VehicleID) REFERENCES Vehicle (VehicleID) ON DELETE CASCADE ON UPDATE CASCADE,
(x1...> FOREIGN KEY (DriverID) REFERENCES Employee (DriverID) ON DELETE CASCADE ON UPDATE CASCADE
(x1...> );

```

```

sqlite> CREATE TABLE Assign (
(x1...> OrderID INTEGER NOT NULL,
(x1...> ArtID VARCHAR(20) NOT NULL,
(x1...> Qty_Ordered INTEGER NOT NULL,
(x1...> PRIMARY KEY (OrderID, ArtID),
(x1...> FOREIGN KEY (ArtID) REFERENCES ArtWorks (ArtID) ON DELETE CASCADE ON UPDATE CASCADE,
(x1...> FOREIGN KEY (OrderID) REFERENCES Orders (OrderID) ON DELETE CASCADE ON UPDATE CASCADE
(x1...> );

```

SELECT Statement to Verify Creating Tables:

```

sqlite> .header on
sqlite> .mode column
sqlite> .table
ArtWorks  Customer  Employee  SalesRep  Vehicle
Assign    Driver    Orders    Shipment
sqlite> SELECT * FROM artworks;
sqlite> SELECT * FROM customer;
sqlite> SELECT * FROM employee;
sqlite> SELECT * FROM salesrep;
sqlite> SELECT * FROM vehicle;
sqlite> SELECT * FROM assign;
sqlite> SELECT * FROM driver;
sqlite> SELECT * FROM orders;
sqlite> SELECT * FROM shipment;

```

PRAGMA table_info(<Table_Name>) to Show Table Schema:

```
sqlite> PRAGMA table_info(artworks);
cid  name      type          notnull  dflt_value  pk
---  -
0    ArtID     VARCHAR(20)   1        1           1
1    Art_Des   VARCHAR(100)  1        0           0
2    Art_Price DECIMAL(10,2) 1        0           0
3    Art_Qty   INTEGER       1        0           0
sqlite>
```

```
sqlite> PRAGMA table_info(customer);
cid  name      type          notnull  dflt_value  pk
---  -
0    CustomerID TEXT         1        1           1
1    Cus_FName VARCHAR(20)  1        0           0
2    Cus_MName VARCHAR(15)  0        0           0
3    Cus_LName VARCHAR(15)  1        0           0
4    Billing_Street VARCHAR(100) 1        0           0
5    Billing_Apt VARCHAR(50)  1        0           0
6    Billing_City VARCHAR(50)  1        0           0
7    Billing_State VARCHAR(5)   1        0           0
8    Billing_Zip VARCHAR(10)  1        0           0
9    Cus_Phone VARCHAR(15)  0        0           0
10   Cus_Email VARCHAR(50)  1        0           0
sqlite>
```

```
sqlite> PRAGMA table_info(employee);
```

cid	name	type	notnull	dflt_value	pk
0	EmployeeID	INT	1		1
1	SSN	VARCHAR(11)	1		0
2	Emp_FName	VARCHAR(20)	1		0
3	Emp_MName	VARCHAR(15)	0		0
4	Emp_LName	VARCHAR(15)	1		0
5	DoB	TEXT	1		0
6	Emp_Type	VARCHAR(25)	1		0
7	Emp_Salary	DECIMAL(10,2)	1		0
8	Emp_Street	VARCHAR(100)	1		0
9	Emp_Apt	VARCHAR(20)	1		0
10	Emp_City	VARCHAR(50)	1		0
11	Emp_State	VARCHAR(5)	1		0
12	Emp_Zip	VARCHAR(10)	1		0
13	Emp_Phone	VARCHAR(15)	1		0

```
sqlite>
```

```
sqlite> PRAGMA table_info(salesrep);
```

cid	name	type	notnull	dflt_value	pk
0	SalesRepID	INT	1		1
1	Commission	DECIMAL(10,2)	1		0

```
sqlite>
```

```
sqlite> PRAGMA table_info(vehicle);
```

cid	name	type	notnull	dflt_value	pk
0	VehicleID	VARCHAR(15)	1		1
1	DriverID	INTEGER	1		0
2	VLICENSE_No	VARCHAR(10)	1		0
3	VLICENSE_Exp	TEXT	1		0
4	Inspection_Exp	TEXT	1		0

```
sqlite>
```

```
sqlite> PRAGMA table_info(assign);
```

cid	name	type	notnull	dflt_value	pk
0	OrderID	INTEGER	1		1
1	ArtID	VARCHAR(20)	1		2
2	Qty_Ordered	INTEGER	1		0

```
sqlite>
```

```
sqlite> PRAGMA table_info(driver);
```

cid	name	type	notnull	dflt_value	pk
0	DriverID	INT	1		1
1	VehicleID	VARCHAR(15)	1		0
2	DL_No	VARCHAR(20)	1		0
3	DL_Exp_Date	TEXT	1		0

```
sqlite> PRAGMA table_info(orders);
```

cid	name	type	notnull	dflt_value	pk
0	OrderID	INTEGER	1		1
1	CustomerID	TEXT	1		0
2	SalesRepID	INTEGER	1		0
3	ShipmentID	INTEGER	1		0
4	Order_Date	TEXT	1		0
5	Order_Amount	DECIMAL(10,2)	0		0

```
sqlite> PRAGMA table_info(shipment);
```

cid	name	type	notnull	dflt_value	pk
0	ShipmentID	INTEGER	1		1
1	OrderID	INTEGER	1		0
2	VehicleID	VARCHAR(15)	1		0
3	Del_Street	VARCHAR(100)	1		0
4	Del_Apt	VARCHAR(20)	1		0
5	Del_City	VARCHAR(50)	1		0
6	Del_State	VARCHAR(5)	1		0
7	Del_Zip	VARCHAR(10)	1		0
8	Del_Date	TEXT	1		0

```
sqlite> .save Assignment_4
sqlite>
```

Queries:

```
CREATE TABLE Customer (  
    CustomerID TEXT PRIMARY KEY NOT NULL,  
    Cus_FName VARCHAR(20) NOT NULL,  
    Cus_MName VARCHAR(15),  
    Cus_LName VARCHAR(15) NOT NULL,  
    Billing_Street VARCHAR(100) NOT NULL,  
    Billing_Apt VARCHAR(50) NOT NULL,  
    Billing_City VARCHAR(50) NOT NULL,  
    Billing_State VARCHAR(5) NOT NULL,  
    Billing_Zip VARCHAR(10) NOT NULL,  
    Cus_Phone VARCHAR(15),  
    Cus_Email VARCHAR(50) NOT NULL  
);  
  
CREATE TABLE Employee (  
    EmployeeID INT PRIMARY KEY NOT NULL,  
    SSN VARCHAR(11) NOT NULL,  
    Emp_FName VARCHAR(20) NOT NULL,  
    Emp_MName VARCHAR(15),  
    Emp_LName VARCHAR(15) NOT NULL,  
    DoB TEXT NOT NULL,  
    Emp_Type VARCHAR(25) NOT NULL,  
    Emp_Salary DECIMAL(10,2) NOT NULL,  
    Emp_Street VARCHAR(100) NOT NULL,  
    Emp_Apt VARCHAR(20) NOT NULL,  
    Emp_City VARCHAR(50) NOT NULL,  
    Emp_State VARCHAR(5) NOT NULL,  
    Emp_Zip VARCHAR(10) NOT NULL,  
    Emp_Phone VARCHAR(15) NOT NULL  
);  
  
CREATE TABLE ArtWorks (  
    ArtID VARCHAR(20) PRIMARY KEY NOT NULL,  
    Art_Des VARCHAR(100) NOT NULL,  
    Art_Price DECIMAL(10,2) NOT NULL,  
    Art_Qty INTEGER NOT NULL  
);  
  
CREATE TABLE Orders (  
    OrderID INTEGER PRIMARY KEY NOT NULL,  
    CustomerID TEXT NOT NULL,  
    SalesRepID INTEGER NOT NULL,  
    ShipmentID INTEGER NOT NULL,  
    Order_Date TEXT NOT NULL,  
    Order_Amount DECIMAL(10,2),  
    FOREIGN KEY (CustomerID) REFERENCES Customer (CustomerID) ON DELETE CASCADE ON UPDATE CASCADE,  
    FOREIGN KEY (SalesRepID) REFERENCES SalesRep (SalesRepID) ON DELETE CASCADE ON UPDATE CASCADE,  
    FOREIGN KEY (ShipmentID) REFERENCES Shipment (ShipmentID) ON DELETE CASCADE ON UPDATE CASCADE  
);
```



```

CREATE TABLE Vehicle (
    VehicleID VARCHAR(15) PRIMARY KEY NOT NULL,
    DriverID INTEGER NOT NULL,
    VLicense_No VARCHAR(10) NOT NULL,
    VLicense_Exp TEXT NOT NULL,
    Inspection_Exp TEXT NOT NULL,
    FOREIGN KEY (DriverID) REFERENCES Driver (DriverID) ON DELETE CASCADE ON UPDATE CASCADE
);
CREATE TABLE Shipment (
    ShipmentID INTEGER PRIMARY KEY NOT NULL,
    OrderID INTEGER NOT NULL,
    VehicleID VARCHAR(15) NOT NULL,
    Del_Street VARCHAR(100) NOT NULL,
    Del_Apt VARCHAR(20) NOT NULL,
    Del_City VARCHAR(50) NOT NULL,
    Del_State VARCHAR(5) NOT NULL,
    Del_Zip VARCHAR(10) NOT NULL,
    Del_Date TEXT NOT NULL,
    FOREIGN KEY (OrderID) REFERENCES Orders (OrderID) ON DELETE CASCADE ON UPDATE CASCADE,
    FOREIGN KEY (VehicleID) REFERENCES Vehicle (VehicleID) ON DELETE CASCADE ON UPDATE CASCADE
);
CREATE TABLE SalesRep (
    SalesRepID INT PRIMARY KEY NOT NULL,
    Commission DECIMAL(10,2) NOT NULL,
    FOREIGN KEY (SalesRepID) REFERENCES Employee (SalesRepID) ON DELETE CASCADE ON UPDATE CASCADE
);
CREATE TABLE Driver (
    DriverID INT PRIMARY KEY NOT NULL,
    VehicleID VARCHAR(15) NOT NULL,
    DL_No VARCHAR(20) NOT NULL,
    DL_Exp_Date TEXT NOT NULL,
    FOREIGN KEY (VehicleID) REFERENCES Vehicle (VehicleID) ON DELETE CASCADE ON UPDATE CASCADE,
    FOREIGN KEY (DriverID) REFERENCES Employee (DriverID) ON DELETE CASCADE ON UPDATE CASCADE
);
CREATE TABLE Assign (
    OrderID INTEGER NOT NULL,
    ArtID VARCHAR(20) NOT NULL,
    Qty_Ordered INTEGER NOT NULL,
    PRIMARY KEY (OrderID, ArtID),
    FOREIGN KEY (ArtID) REFERENCES ArtWorks (ArtID) ON DELETE CASCADE ON UPDATE CASCADE,
    FOREIGN KEY (OrderID) REFERENCES Orders (OrderID) ON DELETE CASCADE ON UPDATE CASCADE
);

```

```
.Header on
.Mode column
SELECT * FROM artworks;
SELECT * FROM customer;
SELECT * FROM employee;
SELECT * FROM salesrep;
SELECT * FROM vehicle;
SELECT * FROM assign;
SELECT * FROM driver;
SELECT * FROM orders;
SELECT * FROM shipment;
PRAGMA table_info(artworks);
PRAGMA table_info(customer);
PRAGMA table_info(employee);
PRAGMA table_info(salesrep);
PRAGMA table_info(vehicle);
PRAGMA table_info(assign);
PRAGMA table_info(driver);
PRAGMA table_info(orders);
PRAGMA table_info(shipment);
.save Assignment_4
```