**Assignment DBI202**

**Subject: Database E-commerce Website**

**Class: SE1702**

**Group: 5**

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**A.** **Background**

**I.** **General**

1. Database for an e-commerce website:

**Request:**

- There are many brands

- Brands with products divided into different categories

- Each product category has many products, 1 product can be classified into many different categories

- Different brands may offer the same product

- Each customer can buy multiple orders

- When viewing goods, customers can add products of different brands to the same cart, but when creating an invoice, it is necessary to create an invoice for each brand (products of different brands must be stored in the same cart). different bills)

- Products in the same order must be delivered at the same time by the same carrier

**II.** **Requirements:**

1. Propose an Entity / Relationship model for the system

2. Convert the ER model to relational model with corresponding relations and functional dependencies.

3. Create in SQL Server a database corresponding to your relational model. You should create your database and the corresponding tables by using SQL statements. The statements for the creation of the database and the corresponding tables should be saved in a createDB.sql file.

4. Create at least 3 constraints by using « alter table » statements and save these statement in a constraints.sql file.

5. Insert data in your database (at least 5 records for each table). The statements for the insertion should be saved in a insert.sql file.

6. Write some at least 1 query for each of the following requirements. All queries should be saved in the queries.sql file.

a. Query using inner join.

b. Query using outer join.

c. Using subquery in where.

d. Using subquery in from.

e. Query using group by and aggregate functions.

7. Write at least one transaction using rollback and save into the transaction.sql file.

8. Write at least one trigger and save into trigger.sql file.

9. Write at least one procedure and save into procedure.sql file.

**III.** **Destination**

Design and develop a database system for E-commerce website

**IV.** **Tools**

1. Microsoft SQL Database Management Studio 2019

**B. Answer**

1. **System Works and Describe in Details the System**

All attributes with an underscore as primary key.

1. Customer

| **Customer** | **Data Type** | **Allow null** |
| --- | --- | --- |
| CustomerID | nvarchar(50) | No |
| CustomerName | nvarchar(50) | Yes |
| Phone | nvarchar(10) | Yes |
| Email | nvarchar(50) | Yes |

Target: Created to store customer information such as customer name, phone number and email. Each digital customer has different IDs and no two IDs are the same.

1. Products

| **Products** | **Data Type** | **Allow null** |
| --- | --- | --- |
| ProductID | varchar(5) | No |
| ProductName | nvarchar(50) | Yes |
| Price | float | Yes |
| StockQuantity | int | Yes |

Target: Created to store information of products such as name, selling price and inventory quantity of each product. Each product has a different ID.

1. Brands

| **Brands** | **Data Type** | **Allow null** |
| --- | --- | --- |
| BrandID | varchar(5) | No |
| BrandName | nvarchar(50) | Yes |

Target: Created to store information of brands such as brand names. Each brand has different IDs.

1. Categories

| **Categories** | **Data Type** | **Allow null** |
| --- | --- | --- |
| categoryID | varchar(5) | No |
| categoryName | nvarchar(50) | Yes |

Target: Created to save information of product categories. Each product type has a different ID.

1. Address

| **Address** | **Data Type** | **Allow null** |
| --- | --- | --- |
| addressID | varchar(5) | No |
| addressName | nvarchar(200) | Yes |

Target: Created to store customer address information. Each address has a different ID .

1. Orders

| **Orders** | **Data Type** | **Allow null** |
| --- | --- | --- |
| OrderID | varchar(5) | No |
| OrderDate | Date | Yes |
| Payment | bit | Yes |

Target: Created to store each customer's order information, order date and payment status of each order. Each order has a different ID.

1. Delivery

| **Delivery** | **Data Type** | **Allow null** |
| --- | --- | --- |
| DeliveryID | varchar(5) | No |
| DeliveryName | nvarchar(50) | Yes |
| Address | nvarchar(50) | Yes |

Target: Store shipping information for each order. Including the delivery address and delivery company name. Each delivery has different shipping IDs

1. Brand\_Has

| **Brand\_Has** | **Data Type** | **Allow null** |
| --- | --- | --- |
| BrandID | varchar(5) | No |
| ProductID | varchar(5) | No |

Target: Created to store information about each product of each brand. Each product type has different brand IDs and product IDs

1. BelongTo

| **BelongTo** | **Data Type** | **Allow null** |
| --- | --- | --- |
| CategoryID | varchar(5) | No |
| ProductID | varchar(5) | No |

Target: Created to store information per product of each type of item. Each product type has different product type IDs and product IDs.

1. CartItems

| **Customer** | **Data Type** | **Allow null** |
| --- | --- | --- |
| CustomerID | nvarchar(50) | No |
| ProductID | varchar(5) | No |
| Quantity | nvarchar(10) | Yes |

Target: Created to store information about each customer's product in each cart and the number of products in the cart. Each product type has different customer IDs and product IDs.

1. Has(Relation between Customers and Address)

| **BelongTo** | **Data Type** | **Allow null** |
| --- | --- | --- |
| CustomerID | nvarchar(50) | No |
| AddressID | varchar(5) | No |

Target: Created to store the address information of each customer. Each address has different customer IDs and address IDs.

1. DeliveryStatus

| **DeliveryStatus** | **Data Type** | **Allow null** |
| --- | --- | --- |
| DeliveryID | varchar(5) | No |
| OrderID | varchar(5) | No |
| Status | nvarchar(20) | Yes |
| ReceiveTime | DateTime | Yes |
| DeliveryTime | DateTime | Yes |

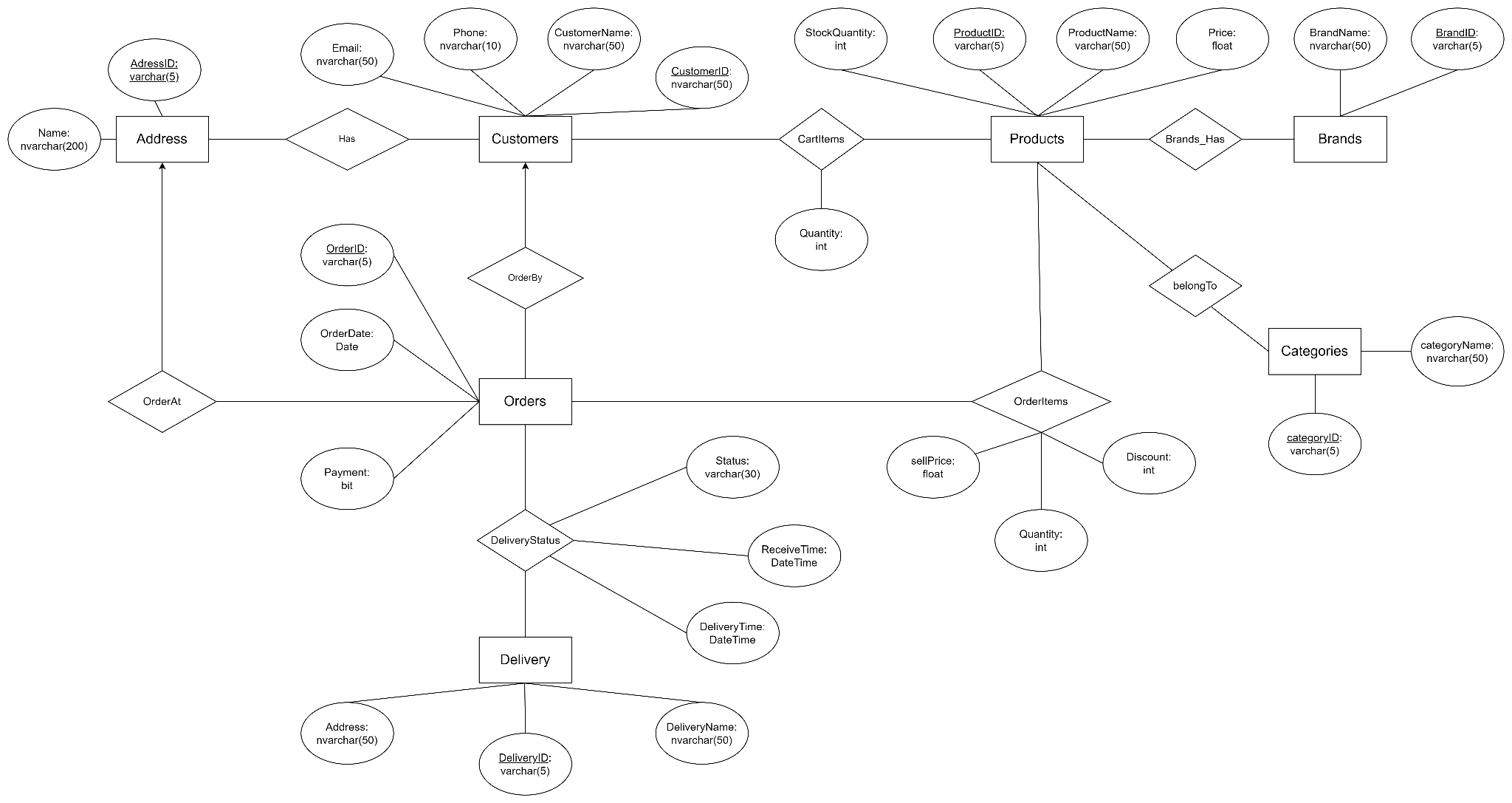
Target: Created to store shipping information of each order.In which, it stores the shipping status(Status),Receipt time and delivery time of each order.Each order type has IDs. Shipping and order ID are different.

1. OrderItems

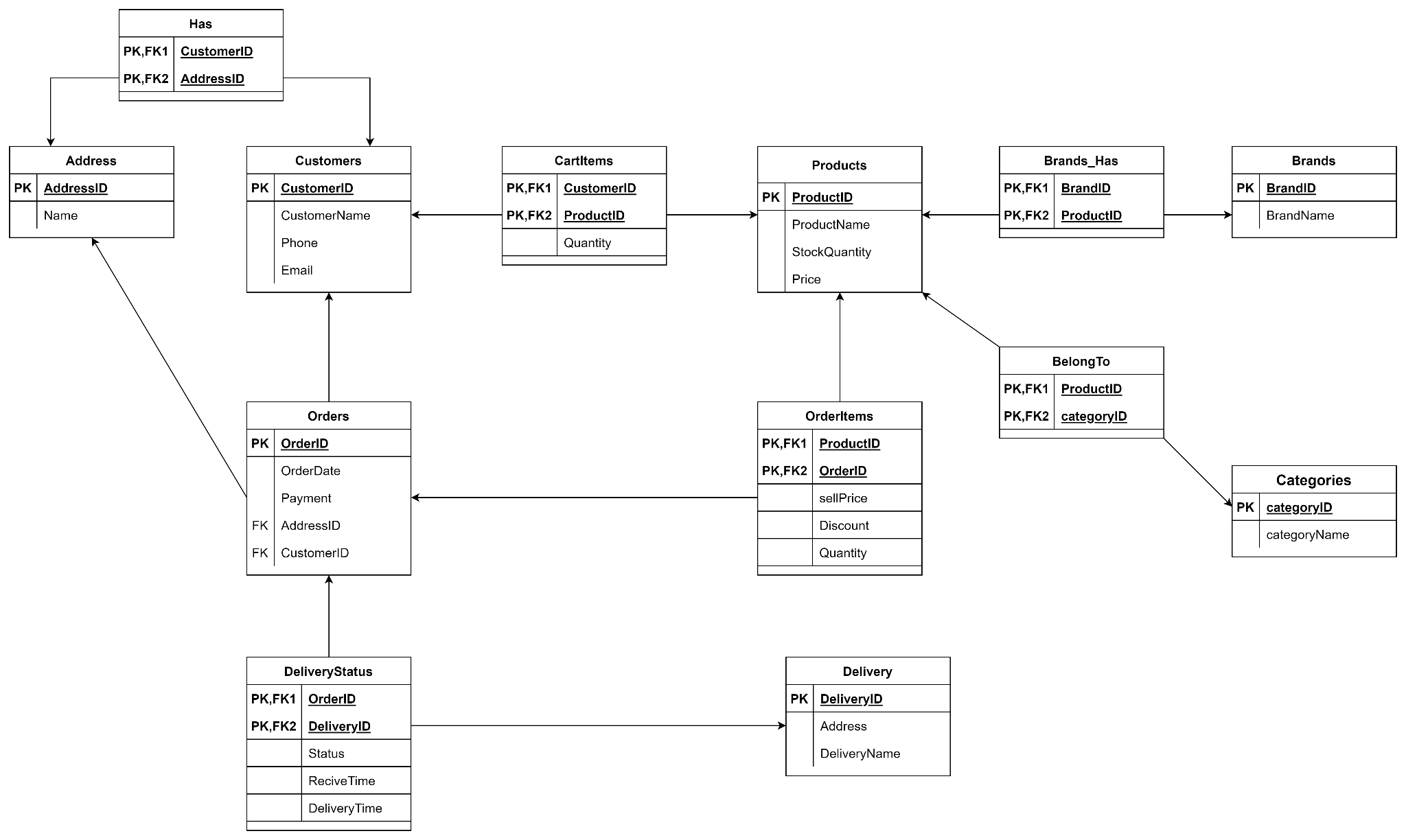
| **OrderItems** | **Data Type** | **Allow null** |
| --- | --- | --- |
| ProductID | varchar(5) | No |
| OrderID | varchar(5) | No |
| Quantity | int | Yes |
| Discount | int | Yes |
| SellPrice | float | Yes |

Target: Create to store information for each product of each order. Including information about the order quantity of each order, the discount (discount) and the selling price of each product. Each product type has different order IDs and product IDs.

**2.ERD model**



**3. Relation Model**



**4.Create Database**

**CREATE** **TABLE** Brands**(**

BrandID VARCHAR**(**5**),**

BrandName NVARCHAR**(**50**),**

**)**

**ALTER** **TABLE** dbo**.**Brands

**ALTER** **COLUMN** BrandID VARCHAR**(**5**)** **NOT** **NULL**

**ALTER** **TABLE** Brands

**ADD** **CONSTRAINT** PK\_Brands\_BrandID **PRIMARY** **KEY** **(**BrandID**)**

**CREATE** **TABLE** Products**(**

ProductID VARCHAR**(**5**),**

ProductName VARCHAR**(**50**),**

StockQuantity INT**,**

Price FLOAT

**)**

**ALTER** **TABLE** dbo**.**Products

**ALTER** **COLUMN** ProductID VARCHAR**(**5**)** **NOT** **NULL**

**ALTER** **TABLE** dbo**.**Products

**ADD** **CONSTRAINT** PK\_Products **PRIMARY** **KEY** **(**ProductID**)**

**CREATE** **TABLE** Brands\_Has**(**

BrandID VARCHAR**(**5**)** **REFERENCES** dbo**.**Brands**(**BrandID**),**

ProductID VARCHAR**(**5**)** **REFERENCES** dbo**.**Products**(**ProductID**),**

**PRIMARY** **KEY(**BrandID**,**ProductID**)**

**)**

**CREATE** **TABLE** Categories**(**

CategoryID VARCHAR**(**5**),**

CategoryName NVARCHAR**(**50**),**

**)**

**ALTER** **TABLE** dbo**.**Categories

**ALTER** **COLUMN** CategoryID VARCHAR**(**5**)** **NOT** **NULL**

**ALTER** **TABLE** dbo**.**Categories

**ADD** **CONSTRAINT** PK\_Categories **PRIMARY** **KEY** **(**CategoryID**)**

**CREATE** **TABLE** BelongTo**(**

CategoryID VARCHAR**(**5**),**

ProductID VARCHAR**(**5**),**

**)**

**ALTER** **TABLE** dbo**.**BelongTo

**ADD** **FOREIGN** **KEY** **(**CategoryID**)** **REFERENCES** dbo**.**Categories**(**CategoryID**)**

**ALTER** **TABLE** dbo**.**BelongTo

**ADD** **FOREIGN** **KEY** **(**ProductID**)** **REFERENCES** dbo**.**Products**(**ProductID**)**

**ALTER** **TABLE** dbo**.**BelongTo

**ALTER** **COLUMN** CategoryID VARCHAR**(**5**)** **NOT** **NULL**

**ALTER** **TABLE** dbo**.**BelongTo

**ALTER** **COLUMN** ProductID VARCHAR**(**5**)** **NOT** **NULL**

**ALTER** **TABLE** dbo**.**BelongTo

**ADD** **CONSTRAINT** PK\_BelongTo **PRIMARY** **KEY** **(**ProductID**,** CategoryID**)**

**CREATE** **TABLE** Customers**(**

CustomerID NVARCHAR**(**50**)PRIMARY** **KEY,**

CustomerName NVARCHAR**(**50**),**

Phone NVARCHAR**(**10**),**

Email NVARCHAR**(**50**),**

**)**

**CREATE** **TABLE** CartItems**(**

CustomerID NVARCHAR**(**50**)** **REFERENCES** dbo**.**Customers**(**CustomerID**),**

ProductID VARCHAR**(**5**)** **REFERENCES** dbo**.**Products**(**ProductID**),**

Quantity INT**,**

**PRIMARY** **KEY(**CustomerID**,** ProductID**)**

**)**

**CREATE** **TABLE** Address**(**

AddressID VARCHAR**(**5**)** **PRIMARY** **KEY,**

Name NVARCHAR**(**100**),**

**)**

**CREATE** **TABLE** Has**(**

CustomerID NVARCHAR**(**50**)** **REFERENCES** dbo**.**Customers**(**CustomerID**),**

AddressID VARCHAR**(**5**)** **REFERENCES** dbo**.**Address**(**AddressID**),**

**PRIMARY** **KEY(**CustomerID**,**AddressID**),**

**)**

**CREATE** **TABLE** Orders**(**

OrderID VARCHAR**(**5**)** **PRIMARY** **KEY,**

OrderDate DATE**,**

Payment BIT**,**

CustomerID NVARCHAR**(**50**)** **REFERENCES** dbo**.**Customers**(**CustomerID**),**

AddressID VARCHAR**(**5**)** **REFERENCES** dbo**.**Address**(**AddressID**),**

**)**

**CREATE** **TABLE** Delivery**(**

DeliveryID VARCHAR**(**5**)** **PRIMARY** **KEY,**

DeliveryName NVARCHAR**(**50**),**

Address NVARCHAR**(**100**),**

**)**

**CREATE** **TABLE** DeliveryStatus**(**

OrderID VARCHAR**(**5**)** **REFERENCES** Orders**(**OrderID**),**

DeliveryID VARCHAR**(**5**)** **REFERENCES** Delivery**(**DeliveryID**),**

Status NVARCHAR**(**20**)** **,**

ReceiveTime DATETIME**,**

DeliveryTime DATETIME**,**

**PRIMARY** **KEY(**OrderID**,**DeliveryID**)**

**)**

**CREATE** **TABLE** OrderItems**(**

ProductID VARCHAR**(**5**)** **REFERENCES** dbo**.**Products**(**ProductID**),**

OrderID VARCHAR**(**5**)** **REFERENCES** Orders**(**OrderID**),**

Quantity INT **,**

Discount INT**,**

SellPrice FLOAT**,**

**PRIMARY** **KEY(**ProductID**,**OrderID**)**

**)**

5. Create Constraint

-- ADD CONSTRAINT FOR TABLE Brands (PRIMARY KEY)

**ALTER** **TABLE** dbo**.**Brands

**ALTER** **COLUMN** BrandID VARCHAR**(**5**)** **NOT** **NULL**

**ALTER** **TABLE** Brands

**ADD** **CONSTRAINT** PK\_Brands\_BrandID **PRIMARY** **KEY** **(**BrandID**)**

-- ADD CONSTRAINT FOR TABLE Products (PRIMARY KEY)

**ALTER** **TABLE** dbo**.**Products

**ALTER** **COLUMN** ProductID VARCHAR**(**5**)** **NOT** **NULL**

**ALTER** **TABLE** dbo**.**Products

**ADD** **CONSTRAINT** PK\_Products **PRIMARY** **KEY** **(**ProductID**)**

-- ADD CONSTRAINT FOR TABLE Categories (PRIMARY KEY)

**ALTER** **TABLE** dbo**.**Categories

**ALTER** **COLUMN** CategoryID VARCHAR**(**5**)** **NOT** **NULL**

**ALTER** **TABLE** dbo**.**Categories

**ADD** **CONSTRAINT** PK\_Categories **PRIMARY** **KEY** **(**CategoryID**)**

-- ADD CONSTRAINT FOR TABLE BelongTo (FOREIGN KEY)

**ALTER** **TABLE** dbo**.**BelongTo

**ADD** **FOREIGN** **KEY** **(**CategoryID**)** **REFERENCES** dbo**.**Categories**(**CategoryID**)**

**ALTER** **TABLE** dbo**.**BelongTo

**ADD** **FOREIGN** **KEY** **(**ProductID**)** **REFERENCES** dbo**.**Products**(**ProductID**)**

-- ADD CONSTRAINT FOR TABLE BelongTo (PRIMARY KEY)

**ALTER** **TABLE** dbo**.**BelongTo

**ALTER** **COLUMN** CategoryID VARCHAR**(**5**)** **NOT** **NULL**

**ALTER** **TABLE** dbo**.**BelongTo

**ALTER** **COLUMN** ProductID VARCHAR**(**5**)** **NOT** **NULL**

**ALTER** **TABLE** dbo**.**BelongTo

**ADD** **CONSTRAINT** PK\_BelongTo **PRIMARY** **KEY** **(**ProductID**,** CategoryID**)**

**6. Insert Data In Database**

**INSERT** **INTO** Categories **(**CategoryID**,**CategoryName**)**

**VALUES**

**(**'Ca001'**,**N'Footwear'**),**

**(**'Ca002'**,**N'Clothes'**),**

**(**'Ca003'**,**N'Household Goods'**),**

**(**'Ca004'**,**N'Electronic device'**),**

**(**'Ca005'**,**N'Jewel'**)**

**INSERT** **INTO** Products **(**ProductID**,**ProductName**,** StockQuantity**,**Price**)**

**VALUES**

**(**'Pr001'**,**N'Laptop'**,**'10'**,**'1000'**),**

**(**'Pr002'**,**N'Watch'**,**'15'**,**'120'**),**

**(**'Pr003'**,**N'Smart Phone'**,**'30'**,**'900'**),**

**(**'Pr004'**,**N'Tablet'**,**'45'**,**'500'**),**

**(**'Pr005'**,**N'Necklace'**,**'20'**,**'80'**),**

**(**'Pr006'**,**N'Shirt'**,**'25'**,**'70'**),**

**(**'Pr007'**,**N'Jeans'**,**'40'**,**'75'**),**

**(**'Pr008'**,**N'Hand Bag'**,**'70'**,**'100'**),**

**(**'Pr009'**,**N'Fridge'**,**'90'**,**'1000'**),**

**(**'Pr010'**,**N'Washing Machine'**,**'38'**,**'1500'**),**

**(**'Pr011'**,**N'Microwave Oven'**,**'27'**,**'1240'**),**

**(**'Pr012'**,**N'Television'**,**'30'**,**'1400'**),**

**(**'Pr013'**,**N'Sport shoes'**,**'50'**,**'300'**)**

**Insert** **Into** Brands\_Has **(**BrandID**,** ProductID**)**

**Values**

**(**'Br001'**,**'Pr005'**),**

**(**'Br001'**,**'Pr006'**),**

**(**'Br001'**,**'Pr007'**),**

**(**'Br001'**,**'Pr008'**),**

**(**'Br002'**,**'Pr005'**),**

**(**'Br002'**,**'Pr006'**),**

**(**'Br002'**,**'Pr007'**),**

**(**'Br002'**,**'Pr008'**),**

**(**'Br003'**,**'Pr005'**),**

**(**'Br003'**,**'Pr006'**),**

**(**'Br003'**,**'Pr007'**),**

**(**'Br004'**,**'Pr009'**),**

**(**'Br004'**,**'Pr011'**),**

**(**'Br004'**,**'Pr012'**),**

**(**'Br005'**,**'Pr013'**),**

**(**'Br006'**,**'Pr012'**),**

**(**'Br006'**,**'Pr010'**),**

**(**'Br007'**,**'Pr001'**),**

**(**'Br008'**,**'Pr001'**),**

**(**'Br008'**,**'Pr002'**),**

**(**'Br008'**,**'Pr003'**),**

**(**'Br008'**,**'Pr004'**)**

**Insert** **Into** BelongTo**(**CategoryID**,**ProductID**)**

**Values**

**(**'Ca001'**,**'Pr013'**),**

**(**'Ca002'**,**'Pr006'**),**

**(**'Ca002'**,**'Pr007'**),**

**(**'Ca003'**,**'Pr009'**),**

**(**'Ca003'**,**'Pr010'**),**

**(**'Ca003'**,**'Pr011'**),**

**(**'Ca003'**,**'Pr012'**),**

**(**'Ca004'**,**'Pr012'**),**

**(**'Ca004'**,**'Pr004'**),**

**(**'Ca004'**,**'Pr001'**),**

**(**'Ca005'**,**'Pr005'**),**

**(**'Ca005'**,**'Pr002'**)**

**Insert** **Into** Customers **(**CustomerID**,**CustomerName**,**Phone**,**Email**)**

**values**

**(**'C001'**,**N'Đỗ Anh Tú'**,**'0316279989'**,**'doanhtu@gmail.com'**),**

**(**'C002'**,**N'Nguyễn Văn Nam'**,**'0398388290'**,**'nguyenvannam@gmail.com'**),**

**(**'C003'**,**N'Đặng Văn Hải'**,**'0932419895'**,**'dangvanhai@gmail.com'**),**

**(**'C004'**,**N'Trần Văn Tùng'**,**'0989102345'**,**'tranvantung@gmail.com'**),**

**(**'C005'**,**N'Nguyễn Quốc Việt'**,**'0312812733'**,**'nguyenquocviet@gmail.com'**),**

**(**'C006'**,**N'Hoàng Thị Phương'**,**'0357899959'**,**'hoangthiphuong@gmail.com'**),**

**(**'C007'**,**N'Khuất Văn Tiến'**,**'056935833'**,**'khuatvantien@gmail.com'**),**

**(**'C008'**,**N'Nguyễn Thị Lan'**,**'039837344'**,**'nguyenthilan@gmail.com'**),**

**(**'C009'**,**N'Phùng Thu Hà'**,**'0999088280'**,**'phungthuha@gmail.com'**)**

**insert** **into** CartItems**(**CustomerID**,**ProductID**,**Quantity**)**

**values**

**(**'C001'**,**'Pr001'**,**'1'**),**

**(**'C001'**,**'Pr002'**,**'1'**),**

**(**'C001'**,**'Pr013'**,**'2'**),**

**(**'C002'**,**'Pr002'**,**'1'**),**

**(**'C002'**,**'Pr004'**,**'2'**),**

**(**'C004'**,**'Pr005'**,**'3'**),**

**(**'C004'**,**'Pr009'**,**'2'**),**

**(**'C004'**,**'Pr010'**,**'1'**),**

**(**'C004'**,**'Pr011'**,**'2'**),**

**(**'C005'**,**'Pr001'**,**'1'**),**

**(**'C007'**,**'Pr006'**,**'2'**),**

**(**'C008'**,**'Pr007'**,**'3'**),**

**(**'C008'**,**'Pr008'**,**'2'**),**

**(**'C009'**,**'Pr012'**,**'1'**),**

**(**'C009'**,**'Pr011'**,**'1'**),**

**(**'C009'**,**'Pr009'**,**'1'**),**

**(**'C009'**,**'Pr003'**,**'1'**)**

**Insert** **Into** Address **(**AddressID**,**Name**)**

**Values**

**(**'Ad001'**,**N'Số 10, Quận Cầu Giấy,Thành phố Hà Nội'**),**

**(**'Ad002'**,**N'508 Nguyễn Bỉnh Khiêm, Quận Ngô Quyền,Thành phố Hải Phòng'**),**

**(**'Ad003'**,**N'Số 233,Phường Tân Thanh, Thành Phố Điện Biên'**),**

**(**'Ad004'**,**N'Số 402, Phường Chiềng Lề, Thành phố Sơn La'**)**

**INSERT** **INTO** Address **(**AddressID**,**Name**)**

**VALUES**

**(**'Ad005'**,**N'Số nhà 090, Phường Duyên Hải, Thành Phố Lào Cai'**),**

**(**'Ad006'**,**N'Số nhà 312, Tổ 9, Thị trấn Yên Bình,Tỉnh Yên Bái'**),**

**(**'Ad007'**,**N'22D2 Tống Duy Tân, Phường 9, Thành Phố Vũng Tàu, Bà Rịa - Vũng Tàu'**),**

**(**'Ad008'**,**N'Thôn 9, X. Hải Xuân, TP. Móng Cái, Quảng Ninh'**),**

**(**'Ad009'**,**N'195 Nguyễn Suý, Phường Tân Quý, Quận Tân Phú, Thành phố Hồ Chí Minh'**),**

**(**'Ad010'**,**N'117 Nguyễn Dữ, Phường Khuê Trung, Quận Cẩm Lệ, TP. Đà Nẵng'**),**

**(**'Ad011'**,**N'Số nhà 88, Ngõ 42, Phố Triều Khúc, Phường Thanh Xuân Nam, Quận Thanh Xuân, Thành phố Hà Nội'**)**

**Insert** **into** Orders **(**OrderID**,**OrderDate**,**Payment**,**CustomerID**,**AddressID**)**

**Values**

**(**'Or001'**,**'2022-11-5'**,**'0'**,**'C001'**,**'Ad001'**),**

**(**'Or002'**,**'2022-11-4'**,**'1'**,**'C001'**,**'Ad008'**),**

**(**'Or003'**,**'2022-11-4'**,**'1'**,**'C003'**,**'Ad009'**),**

**(**'Or004'**,**'2022-11-3'**,**'1'**,**'C007'**,**'Ad001'**),**

**(**'Or005'**,**'2022-11-1'**,**'1'**,**'C009'**,**'Ad003'**),**

**(**'Or006'**,**'2022-10-27'**,**'0'**,**'C008'**,**'Ad001'**),**

**(**'Or007'**,**'2022-10-30'**,**'0'**,**'C009'**,**'Ad007'**),**

**(**'Or008'**,**'2022-11-3'**,**'0'**,**'C002'**,**'Ad005'**),**

**(**'Or009'**,**'2022-11-2'**,**'1'**,**'C005'**,**'Ad011'**),**

**(**'Or010'**,**'2022-11-1'**,**'1'**,**'C004'**,**'Ad006'**),**

**(**'Or011'**,**'2022-10-20'**,**'1'**,**'C004'**,**'Ad010'**),**

**(**'Or012'**,**'2022-11-5'**,**'1'**,**'C005'**,**'Ad009'**),**

**(**'Or013'**,**'2022-11-3'**,**'0'**,**'C002'**,**'Ad008'**),**

**(**'Or014'**,**'2022-10-12'**,**'1'**,**'C007'**,**'Ad007'**),**

**(**'Or015'**,**'2022-11-3'**,**'1'**,**'C008'**,**'Ad006'**),**

**(**'Or016'**,**'2022-10-24'**,**'1'**,**'C002'**,**'Ad005'**),**

**(**'Or017'**,**'2022-10-30'**,**'1'**,**'C002'**,**'Ad004'**)**

**INSERT** **INTO** OrderItems**(**ProductID**,**OrderID**,**SellPrice**,**Quantity**,**Discount**)**

**VALUES**

**(**'Pr001'**,**'Or001'**,**'1200'**,**'1'**,**'10'**),**

**(**'Pr001'**,**'Or002'**,**'1200'**,**'2'**,**'20'**),**

**(**'Pr001'**,**'Or003'**,**'1000'**,**'1'**,**'0'**),**

**(**'Pr002'**,**'Or001'**,**'200'**,**'1'**,**'5'**),**

**(**'Pr002'**,**'Or004'**,**'300'**,**'2'**,**'20'**),**

**(**'Pr003'**,**'Or005'**,**'900'**,**'2'**,**'15'**),**

**(**'Pr004'**,**'Or015'**,**'700'**,**'3'**,**'10'**),**

**(**'Pr004'**,**'Or006'**,**'1000'**,**'4'**,**'12'**),**

**(**'Pr005'**,**'Or002'**,**'200'**,**'2'**,**'12'**),**

**(**'Pr005'**,**'Or003'**,**'250'**,**'2'**,**'10'**),**

**(**'Pr005'**,**'Or007'**,**'450'**,**'4'**,**'10'**),**

**(**'Pr005'**,**'Or008'**,**'100'**,**'1'**,**'0'**),**

**(**'Pr006'**,**'Or016'**,**'500'**,**'4'**,**'12'**),**

**(**'Pr006'**,**'Or009'**,**'210'**,**'3'**,**'0'**),**

**(**'Pr007'**,**'Or017'**,**'400'**,**'5'**,**'15'**),**

**(**'Pr008'**,**'Or006'**,**'500'**,**'5'**,**'20'**),**

**(**'Pr009'**,**'Or010'**,**'2500'**,**'2'**,**'30'**),**

**(**'Pr009'**,**'Or011'**,**'5000'**,**'4'**,**'20'**),**

**(**'Pr010'**,**'Or002'**,**'3000'**,**'2'**,**'15'**),**

**(**'Pr010'**,**'Or004'**,**'3000'**,**'2'**,**'20'**),**

**(**'Pr011'**,**'Or012'**,**'2880'**,**'2'**,**'15'**),**

**(**'Pr012'**,**'Or013'**,**'1480'**,**'1'**,**'10'**),**

**(**'Pr012'**,**'Or005'**,**'1400'**,**'1'**,**'0'**),**

**(**'Pr013'**,**'Or001'**,**'1200'**,**'4'**,**'0'**),**

**(**'Pr013'**,**'Or002'**,**'390'**,**'1'**,**'12'**),**

**(**'Pr013'**,**'Or014'**,**'900'**,**'3'**,**'10'**)**

**Insert** **into** Has**(**CustomerID**,**AddressID**)**

**vALUES**

**(**'C001'**,**'Ad001'**),**

**(**'C001'**,**'Ad008'**),**

**(**'C001'**,**'Ad009'**),**

**(**'C002'**,**'Ad008'**),**

**(**'C002'**,**'Ad005'**),**

**(**'C002'**,**'Ad004'**),**

**(**'C002'**,**'Ad001'**),**

**(**'C003'**,**'Ad001'**),**

**(**'C003'**,**'Ad008'**),**

**(**'C003'**,**'Ad009'**),**

**(**'C004'**,**'Ad010'**),**

**(**'C004'**,**'Ad006'**),**

**(**'C005'**,**'Ad011'**),**

**(**'C005'**,**'Ad009'**),**

**(**'C006'**,**'Ad001'**),**

**(**'C006'**,**'Ad002'**),**

**(**'C007'**,**'Ad001'**),**

**(**'C007'**,**'Ad007'**),**

**(**'C008'**,**'Ad004'**),**

**(**'C008'**,**'Ad006'**),**

**(**'C008'**,**'Ad011'**),**

**(**'C009'**,**'Ad007'**),**

**(**'C009'**,**'Ad003'**),**

**(**'C009'**,**'Ad006'**),**

**(**'C009'**,**'Ad011'**)**

**Insert** **Into** Delivery**(**DeliveryID**,**DeliveryName**,**Address**)**

**Values**

**(**'De001'**,**N'Viettel'**,**N'Hà Nội'**),**

**(**'De002'**,**N'VNpost'**,**N'Hà Nội'**),**

**(**'De003'**,**N'Giaohangtietkiem'**,**N'Hồ Chí Minh'**),**

**(**'De004'**,**N'J&T Express'**,**N'Đà Nẵng'**),**

**(**'De005'**,**N'Nhanh.vn'**,**N'Hà Nội'**),**

**(**'De006'**,**N'Best Express'**,**N'Cần Thơ'**),**

**(**'De007'**,**N'ProShip'**,**N'Hồ Chí Minh'**)**

**Insert** **Into** DeliveryStatus**(**OrderID**,**DeliveryID**,**Status**,**ReceiveTime**,**DeliveryTime**)**

**Values**

**(**'Or001'**,**'De001'**,**N'Đang Giao'**,** **null** **,**'05-11-22 10:34:00 AM'**),**

**(**'Or002'**,**'De003'**,**N'Đang Đóng Gói'**,null,null),**

**(**'Or003'**,**'De001'**,**N'Đã Giao'**,**'5-11-22 3:40:09 PM'**,**'5-11-22 10:42:35 AM'**),**

**(**'Or004'**,**'De004'**,**N'Đang Đóng Gói'**,null,null),**

**(**'Or005'**,**'De002'**,**N'Đang Giao'**,null,**'3-11-22 10:40:12 PM'**),**

**(**'Or006'**,**'De005'**,**N'Chưa Giao Hàng'**,null,**'1-11-22 4:48:33 AM'**),**

**(**'Or007'**,**'De002'**,**N'Chưa Giao Hàng'**,null,**'2-11-22 10:50:43 AM'**),**

**(**'Or008'**,**'De007'**,**N'Đang Giao'**,null,**'3-11-22 3:36:05 PM'**),**

**(**'Or009'**,**'De003'**,**N'Đang đóng gói'**,null,null),**

**(**'Or010'**,**'De005'**,**N'Đang giao'**,null,**'2-11-22 8:00:10 PM'**),**

**(**'Or011'**,**'De003'**,**N'Đã Giao'**,**'10-30-22 2:15:00 PM'**,**'10-21-22 10:11:12 PM'**),**

**(**'Or012'**,**'De007'**,**N'Đã Giao'**,**'5-11-22 1:45:30 PM'**,**'5-11-22 8:27:45 AM'**),**

**(**'Or013'**,**'De001'**,**N'Đã Giao'**,**'5-11-22 10:34:09 AM'**,**'5-11-22 10:34:30 AM'**),**

**(**'Or014'**,**'De006'**,**N'Đã Giao'**,**'3-11-22 12:19:11 PM'**,**'1-11-22 7:19:22 PM'**),**

**(**'Or015'**,**'De001'**,**N'Chưa Giao Hàng'**,null,**'3-11-22 10:21:18 AM'**),**

**(**'Or016'**,**'De006'**,**N'Chưa Giao Hàng'**,null,**'10-30-22 9:34:41 PM'**),**

**(**'Or017'**,**'De002'**,**N'Chưa Giao Hàng'**,null,**'1-11-22 4:45:11 PM'**)**

**7.Queries**

a.Using Inner join

-- Display all Orders of every Customers

**SELECT** Customers**.**CustomerID**,**CustomerName**,** Address**.**AddressID**,** Name**,** OrderID**,** OrderDate**,** Payment

**FROM** Address **INNER** **JOIN** Orders **ON** Address**.**AddressID **=** Orders**.**AddressID

**JOIN** dbo**.**Customers **ON** Customers**.**CustomerID **=** Orders**.**CustomerID

b.Using Outer join

-- Findinging Customers who have not purchased yet

**SELECT** dbo**.**Customers**.**CustomerID**,**CustomerName **,** Address**.**AddressID**,**Orders**.**OrderDate**,** Name **AS** Address

**FROM** dbo**.**Orders **RIGHT** **JOIN** dbo**.**Customers **ON** Customers**.**CustomerID **=** Orders**.**CustomerID

**LEFT** **JOIN** dbo**.**Address **ON** Address**.**AddressID **=** Orders**.**AddressID

**WHERE** OrderDate **is** **NULL**

c.Using Subquery in Where

-- Find Products that cost more than Shirt and smaller than Television

**SELECT** ProductID**,**ProductName**,**Price**,**StockQuantity

**FROM** dbo**.**Products

**WHERE** price **>=(** **SELECT** Price **FROM** dbo**.**Products **WHERE** ProductName **LIKE** 'Shirt'**)**

**AND** price **<=** **(** **SELECT** Price **FROM** dbo**.**Products **WHERE** ProductName **LIKE** 'Television'**)**

d.Using Subquery in From

-- Count the number of Products that have been ordered by Customers

**SELECT** CustomerID**,**CustomerName**,**Count\_OrderItems

**FROM** **(SELECT** **count(DISTINCT** OrderItems**.**ProductID**)** **AS** Count\_OrderItems**,**Customers**.**CustomerID**,**CustomerName

**FROM** Customers **JOIN** Orders **ON** Orders**.**CustomerID **=** Customers**.**CustomerID

**JOIN** OrderItems **ON** OrderItems**.**OrderID **=** Orders**.**OrderID

**GROUP** **BY** Customers**.**CustomerID**,**CustomerName**)** **AS** OrderItems\_Summary

**ORDER** **BY** Count\_OrderItems

e. Query using group by and aggregate functions.

-- Calculate the total amount of each Product at the original price

**SELECT** ProductID**,**ProductName **,SUM(**StockQuantity **\*** Price**)** **AS** TotalAmount

**FROM** dbo**.**Products

**GROUP** **BY** ProductID**,**ProductName

**8. Transaction Using RollBack**

-- Insert more products into the Products table and then rollback to the original values

**BEGIN** **TRANSACTION**

**INSERT** **INTO** Products **(**ProductID**,**ProductName**,** StockQuantity**,**Price**)**

**VALUES** **(**'Pr014'**,**N'Beds'**,**'100'**,**'4000'**)**

**SELECT** **\*** **FROM** Products

**ROLLBACK** **TRANSACTION**

**SELECT** **\*** **FROM** Products

**9. Trigger**

-- Update phone number for customer

**CREATE** **TRIGGER** tr1

**ON** Customers

**FOR** **UPDATE**

**AS**

**BEGIN**

**SELECT** deleted**.**CustomerID**,**deleted**.**CustomerName**,**deleted**.**Phone **AS** OldPhone**,**inserted**.**Phone **AS** NewPhone

**FROM** inserted **JOIN** deleted **ON**

inserted**.**CustomerID **=** deleted**.**CustomerID

**END**

**10. Store Procedure**

-- Calculate total order of each Customer

**CREATE** **PROCEDURE** proc1 @CustomerID NVARCHAR**(**50**),**@numberTotalOrder INT **OUTPUT**

**AS**

**BEGIN**

**SET** @numberTotalOrder **=** **(**

**SELECT** **COUNT(\*)**

**FROM** Orders

**WHERE** Orders**.**CustomerID **=** @CustomerID

**)**

**END**