ASSIGNMENT 2

```
use l7tutorial;

CREATE TABLE customers (
   CustomerID INT PRIMARY KEY,
   Name VARCHAR(100) NOT NULL,
   Email VARCHAR(100) NOT NULL UNIQUE,
   City VARCHAR(50),
   SignupDate DATE NOT NULL
);
ALTER TABLE customers
ADD CONSTRAINT check_customers_city CHECK (City IS NOT NULL AND City <> '');

CREATE TABLE orders (
   OrderID INT PRIMARY KEY,
   CustomerID INT NOT NULL,
   OrderDate DATE NOT NULL,
   TotalAmount DECIMAL(10, 2) NOT NULL,
   CONSTRAINT FK_orders_customers
         FOREIGN KEY (CustomerID) REFERENCES Customers(CustomerID)
);
ALTER TABLE orders
ADD CONSTRAINT check_orders_totalamount_positive CHECK (TotalAmount >= 0);

CREATE TABLE products (
   ProductID INT PRIMARY KEY,
   ProductName VARCHAR(100) NOT NULL,
   Category VARCHAR(50),
   Price DECIMAL(10, 2) NOT NULL
```

```
);
ALTER TABLE products
ADD CONSTRAINT check_products_price_positive CHECK (Price > 0);
ALTER TABLE products
ADD CONSTRAINT check_products_category_nonempty CHECK (Category IS NOT NULL AND Category <> '');

CREATE TABLE orderDetails (
   OrderDetailID INT PRIMARY KEY,
   OrderID INT NOT NULL,
   ProductID INT NOT NULL,
   Quantity INT NOT NULL,
   Price DECIMAL(10, 2) NOT NULL,
   CONSTRAINT FK_details_order_orderid
        FOREIGN KEY (OrderID) REFERENCES Orders(OrderID),
   CONSTRAINT FK_details_product_productid
        FOREIGN KEY (ProductID) REFERENCES Products(ProductID)
);
ALTER TABLE orderDetails
ADD CONSTRAINT check_orderdetails_quantity_positive CHECK (Quantity > 0);
ALTER TABLE orderDetails
ADD CONSTRAINT check_orderdetails_price_positive CHECK (Price >= 0);

INSERT INTO customers (CustomerID, Name, Email, City, SignupDate) VALUES
(1, 'Anita Chadwell', 'achadwell0@ebay.co.uk', 'Haljala', '2025-02-21'),
(2, 'Seka Arnell', 'sarnell1@nsw.gov.au', 'Ban Ko Lan', '2025-02-15'),
(3, 'Jewell Agneau', 'jagneau2@photobucket.com', 'Don Tan', '2025-04-09'),
(4, 'Thacher Riseley', 'triseley3@joomla.org', 'Mumbai', '2025-06-01');


INSERT INTO products (ProductID, ProductName, Category, Price) VALUES
(101, 'Zephyrus G15', 'Electronics', 1200.00),
```

(102, 'Samsung S25', 'Electronics', 800.00),

(103, 'Sennheiser', 'Electronics', 750.00),

(104, 'Corelle Plate', 'Household', 70.00),

(105, 'Notebook', 'Stationery', 5.00),

(106, 'BMW M7', 'Vehicle', 150000.00);

INSERT INTO orders (OrderID, CustomerID, OrderDate, TotalAmount) VALUES

(1001, 1, '2025-03-01', 1200.00),

(1002, 1, '2025-03-05', 70.00),

(1003, 2, '2025-03-02', 800.00),

(1004, 3, '2025-04-10', 15.00),

(1005, 1, '2025-05-28', 750.00),

(1006, 4, '2025-06-02', 150000.00);

INSERT INTO orderDetails (OrderDetailID, OrderID, ProductID, Quantity, Price) VALUES

(1, 1001, 101, 1, 1200.00),

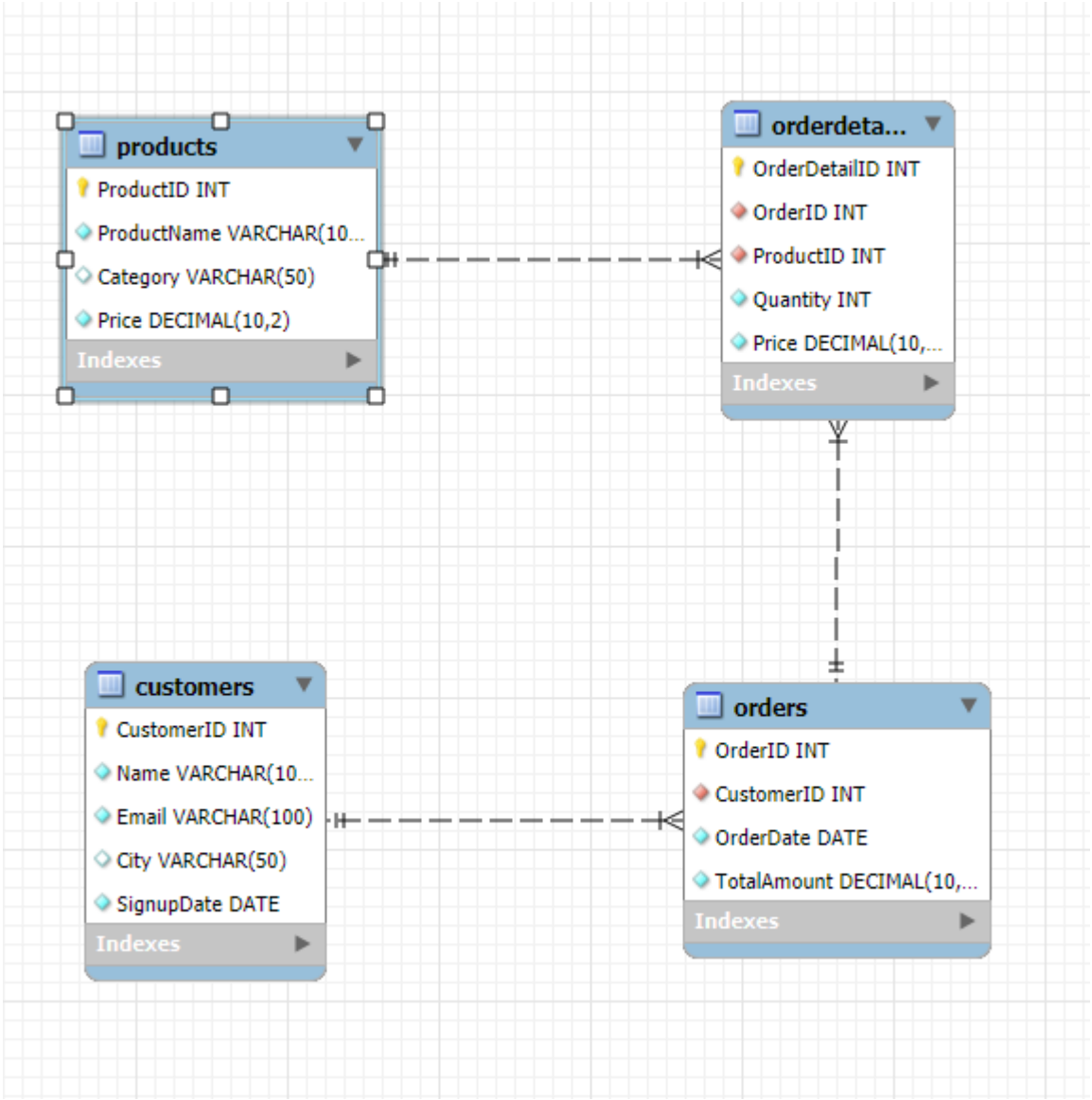
(2, 1002, 104, 1, 70.00),

(3, 1003, 102, 1, 800.00),

(4, 1004, 105, 1, 5.00),

(5, 1005, 103, 1, 750.00),

(6, 1006, 106, 1, 150000.00);


products
ProductID INT
ProductName VARCHAR(10...
Category VARCHAR(50)
Price DECIMAL(10,2)
Indexes
orderdeta...
OrderDetailID INT
OrderID INT
ProductID INT
Quantity INT
Price DECIMAL(10,...
Indexes
customers
CustomerID INT
Name VARCHAR(10...
Email VARCHAR(100)
City VARCHAR(50)
SignupDate DATE
Indexes
orders
OrderID INT
CustomerID INT
OrderDate DATE
TotalAmount DECIMAL(10,...
Indexes

```
use l7tutorial;

-- Basic Queries

-- Get the list of all customers
SELECT CustomerID, Name, Email, City, SignupDate FROM customers;

-- Find all orders placed in the last 30 days
CREATE INDEX IX_customers_signupdate ON customers(SignupDate);
SELECT OrderID, CustomerID, OrderDate, TotalAmount FROM orders
        WHERE OrderDate >= DATE_SUB(CURDATE(), INTERVAL 30 DAY);

-- Show product names and their prices
SELECT ProductName, Price FROM products;

-- Find the total number of products in each category
SELECT Category, COUNT(*) AS TotalProducts
        FROM products
        GROUP BY Category;


-- Filtering and Conditions

-- Get all customers from the city 'Mumbai'
CREATE INDEX IX_customers_city ON customers(City);
SELECT CustomerID, Name, Email, City, SignupDate FROM customers
        WHERE City = 'Mumbai';

-- Find orders with a total amount greater than 5000
CREATE INDEX IX_orders_totalamount ON orders(TotalAmount);
SELECT OrderID, CustomerID, OrderDate, TotalAmount FROM orders
```

```
        WHERE TotalAmount > 5000;


-- List customers who signed up after '2024-01-01'
CREATE INDEX IX_customers_signupdate ON customers(SignupDate);
SELECT CustomerID, Name, Email, City, SignupDate FROM customers
        WHERE SignupDate > '2024-01-01';


-- Joins

-- Show all orders along with the customer's name
SELECT orders.OrderID, orders.OrderDate, orders.TotalAmount, customers.Name
        FROM orders
        INNER JOIN customers ON orders.CustomerID = customers.CustomerID;

-- List products purchased in each order
CREATE INDEX IX_orderdetails_orderid ON orderDetails(OrderID);
CREATE INDEX IX_orderdetails_productid ON orderDetails(ProductID);
SELECT orders.OrderID, products.ProductName, orderDetails.Quantity
        FROM orders
        INNER JOIN orderDetails ON orders.OrderID = orderDetails.OrderID
        INNER JOIN Products ON orderDetails.ProductID = products.ProductID;

-- Find customers who have never placed an order
SELECT
   customers.CustomerID, customers.Name, customers.Email, customers.City, customers.SignupDate
        FROM customers
        LEFT JOIN Orders ON customers.CustomerID = orders.CustomerID
        WHERE orders.OrderID IS NULL;
```

```
-- Aggregation and Grouping

-- Find the total amount spent by each customer
SELECT customers.CustomerID, customers.Name, SUM(orders.TotalAmount) AS TotalSpent
        FROM customers
        LEFT JOIN Orders ON customers.CustomerID =orders.CustomerID
        GROUP BY customers.CustomerID, customers.Name;

-- Which product has been sold the most (by quantity)? though all of mine were qty 1
SELECT products.ProductName, SUM(orderDetails.Quantity) AS TotalQuantity
        FROM products
        INNER JOIN orderDetails ON products.ProductID = orderDetails.ProductID
        GROUP BY products.ProductName
        ORDER BY TotalQuantity DESC
        LIMIT 1;

-- Find the average order value for each customer
SELECT customers.CustomerID, customers.Name, AVG(orders.TotalAmount) AS AverageOrderValue
        FROM customers
        LEFT JOIN orders ON customers.CustomerID = orders.CustomerID
        GROUP BY customers.CustomerID, customers.Name;

-- Total sales amount per product category
CREATE INDEX IX_orderdetails_product_quantity_price ON orderDetails(ProductID, Quantity, Price);
SELECT products.Category, SUM(orderDetails.Quantity * orderDetails.Price) AS TotalSales
        FROM products
        INNER JOIN orderDetails ON products.ProductID = orderDetails.ProductID
        GROUP BY products.Category;
```

```
-- Subqueries

-- Find customers who spent more than the average spending
SELECT customers.CustomerID, customers.Name, SUM(orders.TotalAmount) AS TotalSpent
        FROM customers
        INNER JOIN orders ON customers.CustomerID = orders.CustomerID
        GROUP BY customers.CustomerID, customers.Name
        HAVING TotalSpent > (
                SELECT AVG(TotalAmount)
                FROM orders
        );

-- List products that have never been ordered
SELECT
   products.ProductID,   products.ProductName,   products.Category,   products.Price
        FROM products
        LEFT JOIN orderDetails ON products.ProductID = orderDetails.ProductID
        WHERE orderDetails.OrderID IS NULL;

-- Find the most recent order for each customer
CREATE INDEX IX_orders_customerid_orderdate ON orders(CustomerID, OrderDate);
SELECT customers.CustomerID, customers.Name, orders.OrderID, orders.OrderDate
        FROM customers
        INNER JOIN orders ON customers.CustomerID = orders.CustomerID
        WHERE orders.OrderDate = (
                SELECT MAX(orderDate)
                FROM orders
                WHERE orders.CustomerID = customers.CustomerID
        );
```

```
-- Advanced Queries

-- Rank customers by total spending (highest first)
CREATE INDEX IX_orders_customerid_totalamount ON orders(CustomerID, TotalAmount);
SELECT customers.CustomerID, customers.Name, SUM(orders.TotalAmount) AS TotalSpent
        FROM customers
        LEFT JOIN orders ON customers.CustomerID = orders.CustomerID
        GROUP BY customers.CustomerID, customers.Name
        ORDER BY TotalSpent DESC;

-- Get the top 3 customers based on the number of orders placed
SELECT customers.CustomerID, customers.Name, COUNT(orders.OrderID) AS TotalOrders
        FROM customers
        LEFT JOIN orders ON customers.CustomerID = orders.CustomerID
        GROUP BY customers.CustomerID, customers.Name
        ORDER BY TotalOrders DESC
        LIMIT 3;

-- For each product, find how many unique customers have purchased it
SELECT products.ProductName, COUNT(DISTINCT orders.CustomerID) AS UniqueCustomers
        FROM products
        INNER JOIN orderDetails ON products.ProductID = orderDetails.ProductID
        INNER JOIN orders ON orderDetails.OrderID = orders.OrderID
        GROUP BY products.ProductName;
```