DATABASE MANAGEMENT SYSTEM - CSA0593

ASSIGNMENT 5

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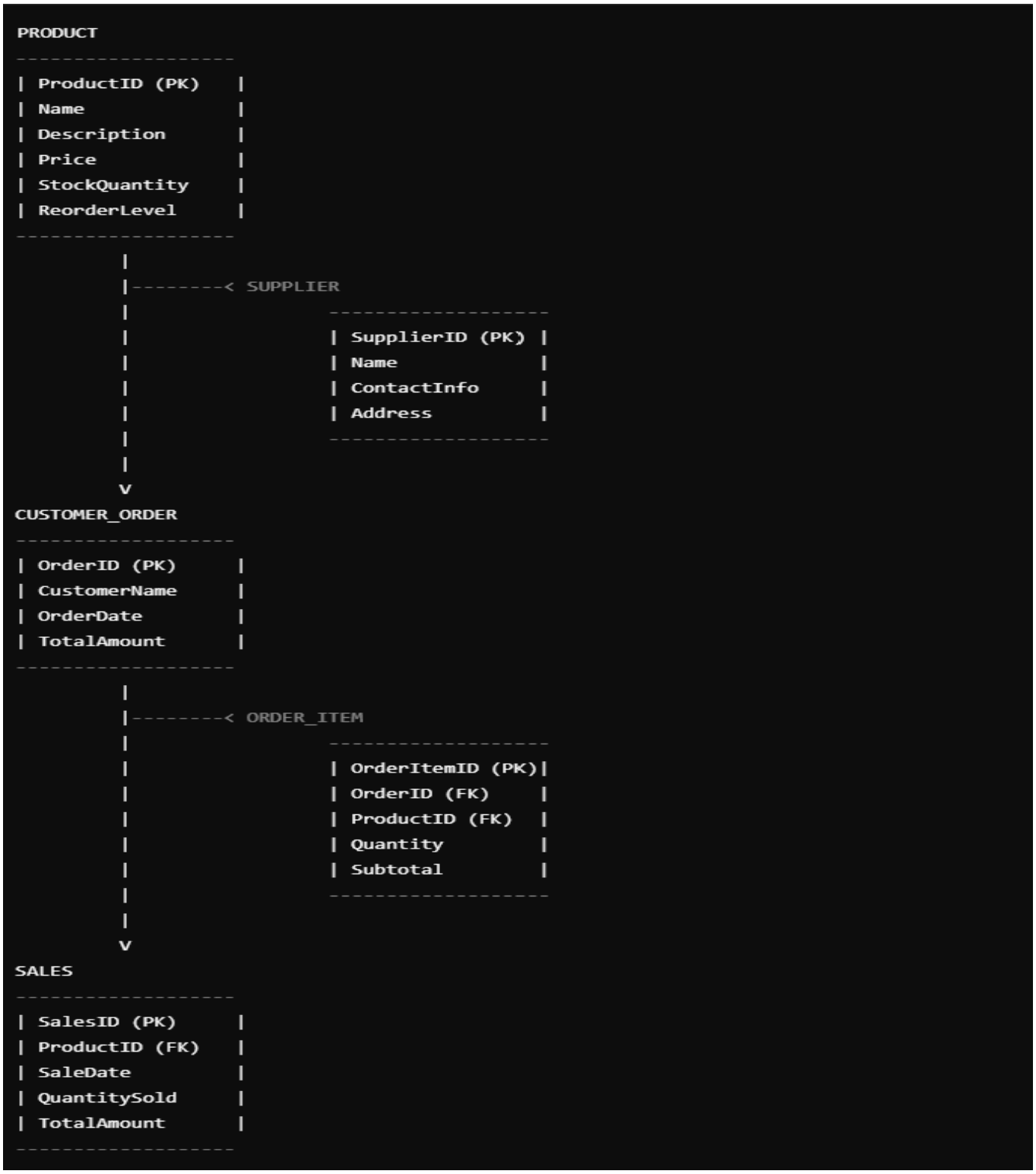
QUESTION:

Model tables for products, suppliers, sales, and customer orders.

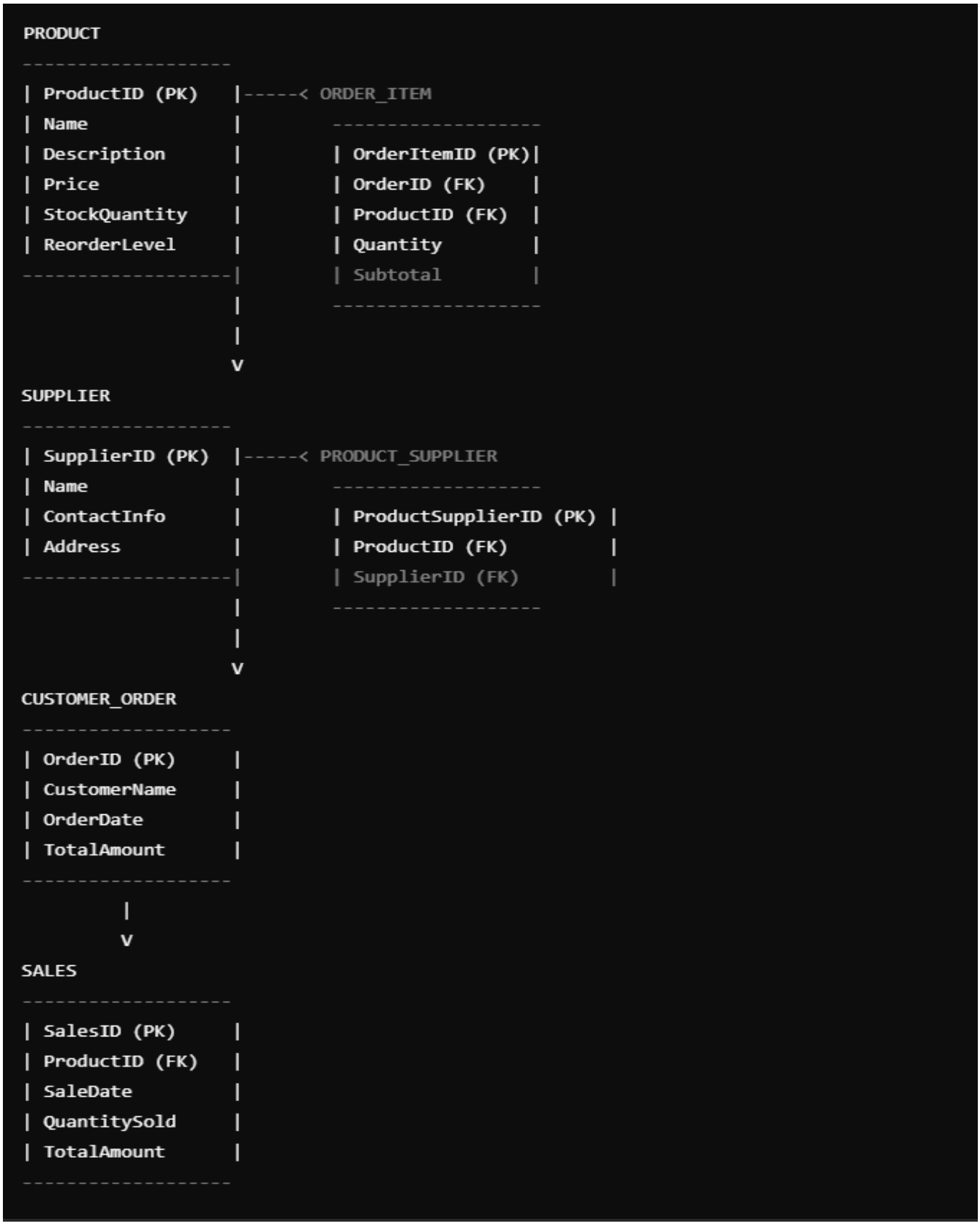
- **Write stored procedures to manage product stock, record sales transactions, and handle order fulfillment.**
- **Implement triggers to update inventory levels and reorder points when items are sold.**
- **Write SQL queries to generate sales reports, top-selling products, and low-stock alerts.**

ANSWER:

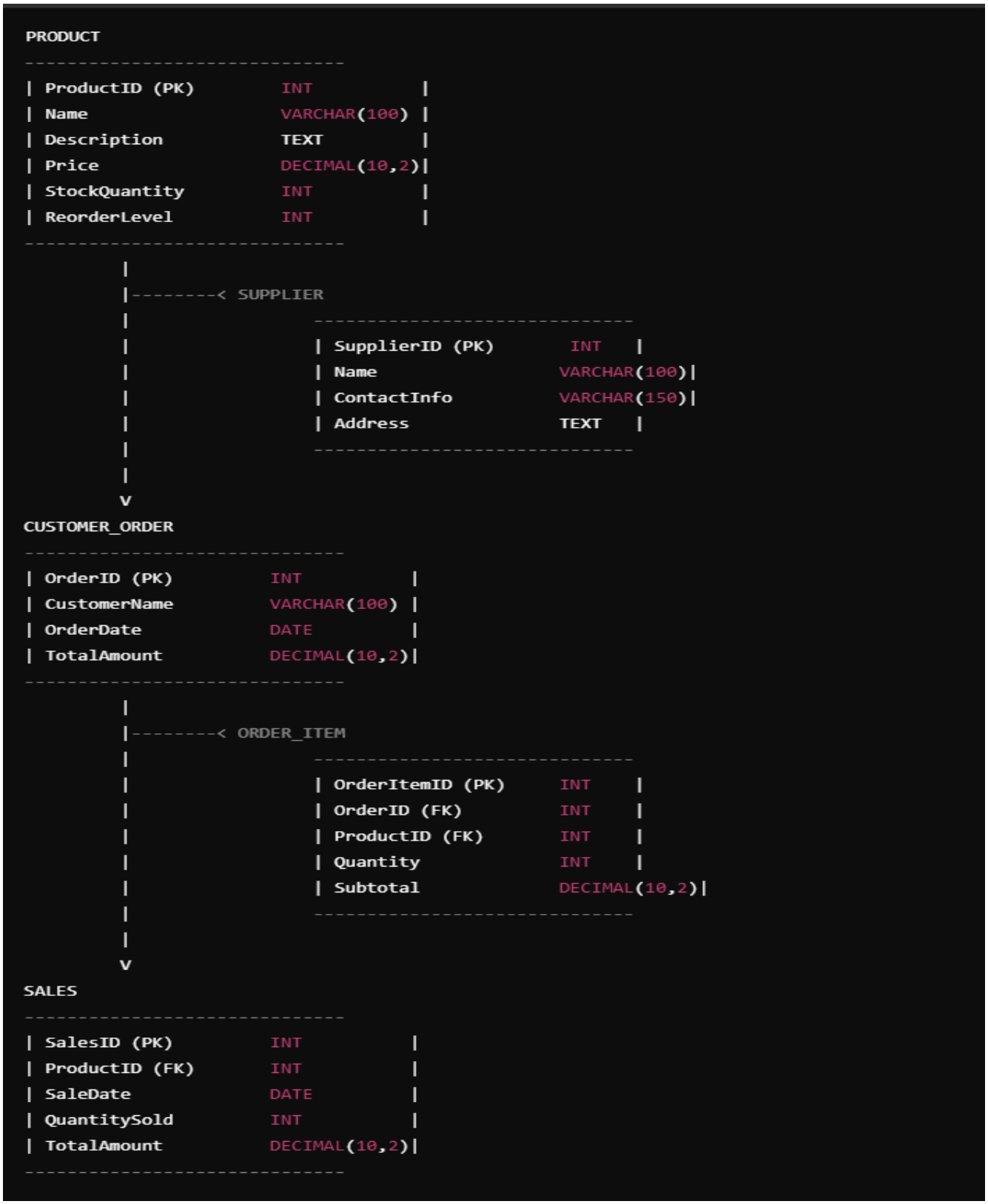
CONCEPTUAL E.R.DIAGRAM:



LOGICAL E.R DIAGRAM:



PHYSICAL E.R.DIAGRAM:



MYSQL STATEMENTS:

```
mysql
CREATE DATABASE SalesManagement;

USE SalesManagement;

CREATE TABLE Suppliers (
  SupplierID INT AUTO_INCREMENT PRIMARY KEY,
  SupplierName VARCHAR(100),
  SupplierAddress VARCHAR(255),
  SupplierPhone VARCHAR(20)
);

CREATE TABLE Products (
  ProductID INT AUTO_INCREMENT PRIMARY KEY,
  ProductName VARCHAR(100),
  ProductDescription VARCHAR(255),
  UnitPrice DECIMAL(10, 2),
```

```
  StockLevel INT,
  ReorderPoint INT,
  SupplierID INT,
  FOREIGN KEY (SupplierID) REFERENCES
Suppliers(SupplierID)
);

CREATE TABLE Customers (
  CustomerID INT AUTO_INCREMENT PRIMARY
KEY,
  CustomerName VARCHAR(100),
  CustomerAddress VARCHAR(255),
  CustomerPhone VARCHAR(20)
);

CREATE TABLE Orders (
  OrderID INT AUTO_INCREMENT PRIMARY KEY,
  CustomerID INT,
  OrderDate DATE,
```

```
  TotalCost DECIMAL(10, 2),
  FOREIGN KEY (CustomerID) REFERENCES Customers(CustomerID)
);

CREATE TABLE OrderItems (
  OrderItemID INT AUTO_INCREMENT PRIMARY KEY,
  OrderID INT,
  ProductID INT,
  Quantity INT,
  FOREIGN KEY (OrderID) REFERENCES Orders(OrderID),
  FOREIGN KEY (ProductID) REFERENCES Products(ProductID)
);

CREATE TABLE Sales (
  SaleID INT AUTO_INCREMENT PRIMARY KEY,
  ProductID INT,
```

```
  SaleDate DATE,
  Quantity INT,
  SalePrice DECIMAL(10, 2),
  FOREIGN KEY (ProductID) REFERENCES
Products(ProductID)
);
```

Stored Procedures:

```
mysql
DELIMITER //

CREATE PROCEDURE sp_RecordSale(
  IN productID INT,
  IN quantity INT,
  IN salePrice DECIMAL(10, 2)
)
```

```
BEGIN
  INSERT INTO Sales (ProductID, SaleDate, Quantity, SalePrice)
  VALUES (productID, CURDATE(), quantity, salePrice);

  UPDATE Products
  SET StockLevel = StockLevel - quantity
  WHERE ProductID = productID;
END //

CREATE PROCEDURE sp_FulfillOrder(
  IN orderID INT
)
BEGIN
  DECLARE finished INT DEFAULT 0;
  DECLARE productID INT;
  DECLARE quantity INT;
```

```
  DECLARE curOrderItems CURSOR FOR
  SELECT ProductID, Quantity
  FROM OrderItems
  WHERE OrderID = orderID;

  DECLARE CONTINUE HANDLER FOR NOT FOUND
SET finished = 1;

  OPEN curOrderItems;

  read_loop: LOOP
    FETCH curOrderItems INTO productID, quantity;
    IF finished = 1 THEN
      LEAVE read_loop;
    END IF;

    CALL sp_RecordSale(productID, quantity,
(SELECT UnitPrice FROM Products WHERE
ProductID = productID));
```

```
  END LOOP;

  CLOSE curOrderItems;
END //

DELIMITER;
```

Triggers:

```
mysql
DELIMITER //

CREATE TRIGGER tr_UpdateReorderPoint
AFTER UPDATE ON Products
FOR EACH ROW
BEGIN
  IF NEW.StockLevel <= NEW.ReorderPoint THEN
```

```
    INSERT INTO LowStockAlerts (ProductID, ProductName, StockLevel)
    VALUES (NEW.ProductID, NEW.ProductName, NEW.StockLevel);
  END IF;
END //

DELIMITER;
```

SQL Queries:

```
mysql
-- Sales Report
SELECT
  ProductName,
  SUM(Quantity) AS TotalSales,
  SUM(SalePrice) AS TotalRevenue
FROM
  Products
```

```
  JOIN Sales ON Products.ProductID =
Sales.ProductID
GROUP BY
  ProductName;

-- Top-Selling Products
SELECT
  ProductName,
  SUM(Quantity) AS TotalSales
FROM
  Products
  JOIN Sales ON Products.ProductID =
Sales.ProductID
GROUP BY
  ProductName
ORDER BY
  TotalSales DESC;

-- Low-Stock Alerts
```

```
SELECT
  ProductName,
  StockLevel
FROM
  LowStockAlerts;
```

Conclusion:

This database design provides a comprehensive foundation for managing products, suppliers, sales, and customer orders. The stored procedures simplify sales transactions and order fulfillment, while the triggers ensure data consistency and accuracy. The SQL queries enable reporting on sales, top-selling products, and low-stock alerts.