SQL CASE-STUDY

TOPIC:-INVENTORY MANAGEMENT SYSTEM

PROBLEM STATEMENT

The current inventory management system lacks real-time tracking and reporting capabilities, leading to inefficiencies such as overstocking, stockouts. This results in increased operational costs, decreased customer satisfaction, and difficulties in data analysis for strategic decision-making. An improved system is needed to streamline inventory control, enhance accuracy, and provide actionable insights for better resource allocation.

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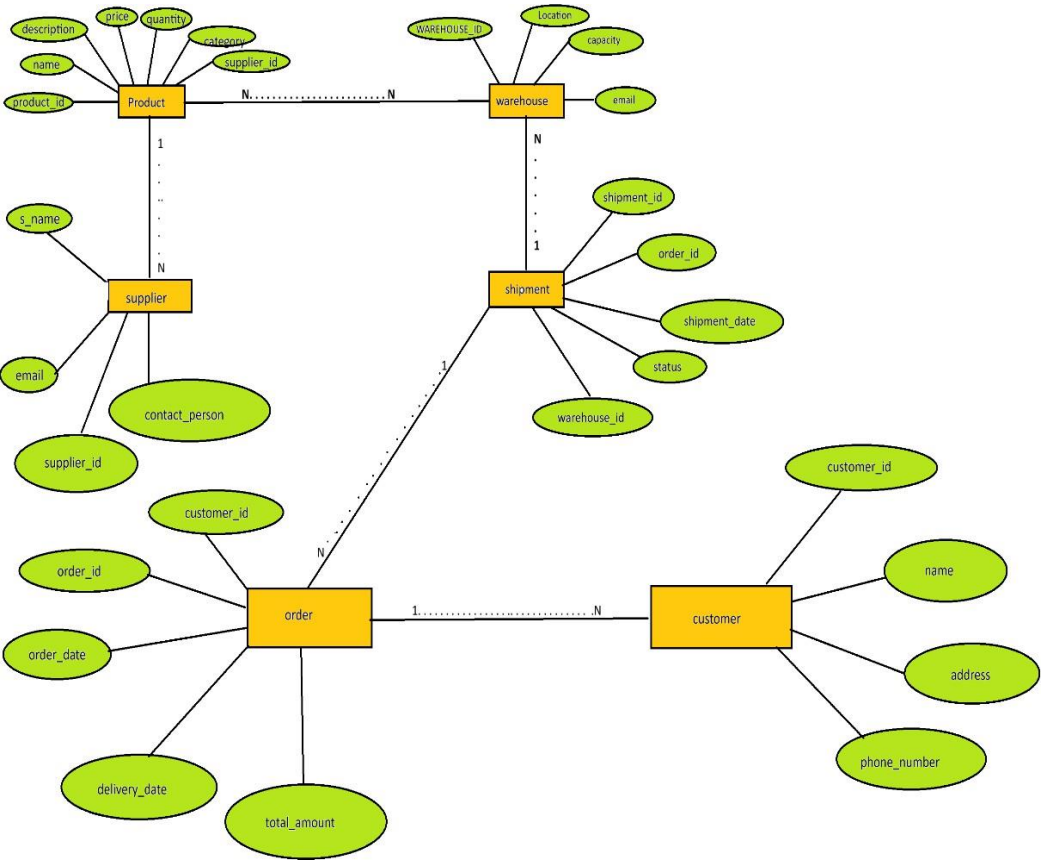
E-R DIAGRAM FOR INVENTORY MANAGEMENT SYSTEM



TABLES FOR ATTRIBUTES:-

Result Grid | Filter Rows:

category_id	category_name
1	Electronics
2	Clothing
3	Home Appliances
4	Books
5	Furniture
NULL	NULL

Result Grid | Filter Rows: | Edit:

supplier_id	supplier_name	contact_info
1	Supplier A	contact@supplierA.com
2	Supplier B	contact@supplierB.com
3	Supplier C	contact@supplierC.com
NULL	NULL	NULL

Result Grid | Filter Rows: | Edit: | Export/Import:

product_id	product_name	category_id	supplier_id	unit_price	quantity_in_stock
1	Laptop	1	1	999.99	50
2	Smartphone	1	1	599.99	100
3	T-shirt	2	2	19.99	200
4	Jeans	2	2	39.99	150
5	Blender	3	3	49.99	75
6	Microwave	3	3	99.99	30
7	Fiction Book	4	2	9.99	300
8	Coffee Table	5	3	199.99	20
NULL	NULL	NULL	NULL	NULL	NULL

Result Grid | Filter Rows: | Edit:

order_id	product_id	quantity_ordered	order_date
1	1	2	2024-01-10
2	2	5	2024-01-15
3	4	3	2024-01-20
4	3	10	2024-01-25
5	5	1	2024-01-30
6	6	2	2024-02-05
7	1	1	2024-02-10
8	2	4	2024-02-15
9	8	1	2024-02-20
NULL	NULL	NULL	NULL

Orders 69

RAW DATA INFORMATION

```
create database db;
use db;

CREATE TABLE Categories (
    category_id INT PRIMARY KEY,
    category_name VARCHAR(50)
);
INSERT INTO Categories (category_id, category_name) VALUES
(1, 'Electronics'),
(2, 'Clothing'),
(3, 'Home Appliances'),
(4, 'Books'),
(5, 'Furniture');
describe Categories;
select * from Categories;

CREATE TABLE Suppliers (
    supplier_id INT PRIMARY KEY,
    supplier_name VARCHAR(100),
    contact_info VARCHAR(100)
);
drop table Suppliers;
INSERT INTO Suppliers (supplier_id, supplier_name, contact_info)
VALUES
```

```
(1, 'Supplier A', 'contact@supplierA.com'),
(2, 'Supplier B', 'contact@supplierB.com'),
(3, 'Supplier C', 'contact@supplierC.com');
describe Suppliers;
select * from Suppliers;

CREATE TABLE Products (
   product_id INT PRIMARY KEY,
   product_name VARCHAR(100),
   category_id INT,
   supplier_id INT,
   unit_price DECIMAL(10, 2),
   quantity_in_stock INT,
   FOREIGN KEY (category_id) REFERENCES Categories(category_id),
   FOREIGN KEY (supplier_id) REFERENCES Suppliers(supplier_id)
);
INSERT INTO Products (product_id, product_name, category_id,
supplier_id, unit_price, quantity_in_stock) VALUES
(1, 'Laptop', 1, 1, 999.99, 50),
(2, 'Smartphone', 1, 1, 599.99, 100),
(3, 'T-shirt', 2, 2, 19.99, 200),
(4, 'Jeans', 2, 2, 39.99, 150),
(5, 'Blender', 3, 3, 49.99, 75),
(6, 'Microwave', 3, 3, 99.99, 30),
(7, 'Fiction Book', 4, 2, 9.99, 300),
(8, 'Coffee Table', 5, 3, 199.99, 20);
describe Products;
```

```
select * from Products;


CREATE TABLE Orders (
    order_id INT PRIMARY KEY,
    product_id INT,
    quantity_ordered INT,
    order_date DATE,
    FOREIGN KEY (product_id) REFERENCES Products(product_id)
);
INSERT INTO Orders (order_id, product_id, quantity_ordered,
order_date) VALUES
(1, 1, 2, '2024-01-10'),
(2, 2, 5, '2024-01-15'),
(3, 4, 3, '2024-01-20'),
(4, 3, 10, '2024-01-25'),
(5, 5, 1, '2024-01-30'),
(6, 6, 2, '2024-02-05'),
(7, 1, 1, '2024-02-10'),
(8, 2, 4, '2024-02-15'),
(9, 8, 1, '2024-02-20');
describe Orders;
select * from Orders;
```

1. List all products.

SELECT * FROM Products;

Result Grid | Filter Rows: | Edit: | Export/Import:

product_id	product_name	category_id	supplier_id	unit_price	quantity_in_stock
1	Laptop	1	1	999.99	50
2	Smartphone	1	1	599.99	100
3	T-shirt	2	2	19.99	200
4	Jeans	2	2	39.99	150
5	Blender	3	3	49.99	75
6	Microwave	3	3	99.99	30
7	Fiction Book	4	2	9.99	300
8	Coffee Table	5	3	199.99	20
NULL	NULL	NULL	NULL	NULL	NULL

2. Find products with a quantity less than 20.

SELECT * FROM Products WHERE quantity_in_stock < 20;

Result Grid | Filter Rows: | Edit: | Export/Import:

product_id	product_name	category_id	supplier_id	unit_price	quantity_in_stock
8	Coffee Table	5	3	199.99	20
NULL	NULL	NULL	NULL	NULL	NULL

3. Get the total number of products in stock.

SELECT SUM(quantity_in_stock) AS total_stock FROM Products;

Result Grid | Filter Rows:

	total_stock
▶	925

4. Find the average unit price of products.

SELECT AVG(unit_price) AS average_price FROM Products;

Result Grid | Filter Rows:

	total_stock
▶	925

5. List products and their categories.

```
SELECT p.product_name, c.category_name
FROM Products p
JOIN Categories c ON p.category_id = c.category_id;
```

Result Grid | Filter Rows:

product_name	category_name
Laptop	Electronics
Smartphone	Electronics
T-shirt	Clothing
Jeans	Clothing
Blender	Home Appliances
Microwave	Home Appliances
Fiction Book	Books
Coffee Table	Furniture

6. Get the number of products per category.

```
SELECT c.category_name, COUNT(p.product_id) AS product_count
FROM Categories c
LEFT JOIN Products p ON c.category_id = p.category_id
GROUP BY c.category_name;
```

Result Grid | Filter Rows:

category_name	product_count
Electronics	2
Clothing	2
Home Appliances	2
Books	1
Furniture	1

7. Find the highest priced product.

SELECT * FROM Products WHERE unit_price = (SELECT MAX(unit_price) FROM Products);

Result Grid | Filter Rows: | Edit: | Export/Import: | Wr

product_id	product_name	category_id	supplier_id	unit_price	quantity_in_stock
1	Laptop	1	1	999.99	50
NULL	NULL	NULL	NULL	NULL	NULL

8. Get products supplied by a specific supplier.

SELECT * FROM Products WHERE supplier_id = (SELECT supplier_id FROM Suppliers WHERE supplier_name = 'Supplier A');

Result Grid | Filter Rows: | Edit: | Export/Import:

product_id	product_name	category_id	supplier_id	unit_price	quantity_in_stock
1	Laptop	1	1	999.99	50
2	Smartphone	1	1	599.99	100
NULL	NULL	NULL	NULL	NULL	NULL

9. List suppliers and their total products supplied.

```
SELECT s.supplier_name, COUNT(p.product_id) AS total_products
FROM Suppliers s
LEFT JOIN Products p ON s.supplier_id = p.supplier_id
GROUP BY s.supplier_name;
```

Result Grid | Filter Rows:

supplier_name	total_products
Supplier A	2
Supplier B	3
Supplier C	3

10. Get the total sales for each product.

```
SELECT p.product_name, SUM(o.quantity_ordered) AS total_sales
FROM Products p
JOIN Orders o ON p.product_id = o.product_id
GROUP BY p.product_name;
```

Result Grid | Filter Rows:

product_name	total_sales
Laptop	3
Smartphone	9
Jeans	3
T-shirt	10
Blender	1
Microwave	2
Coffee Table	1

11. Find products with a unit price higher than the average.

SELECT * FROM Products WHERE unit_price > (SELECT AVG(unit_price) FROM Products);

Result Grid | Filter Rows: | Edit: | Export/Import:

product_id	product_name	category_id	supplier_id	unit_price	quantity_in_stock
1	Laptop	1	1	999.99	50
2	Smartphone	1	1	599.99	100
NULL	NULL	NULL	NULL	NULL	NULL

12. List products that have never been ordered.

SELECT * FROM Products WHERE product_id NOT IN (SELECT product_id FROM Orders);

Result Grid | Filter Rows: | Edit: | Export/Import:

product_id	product_name	category_id	supplier_id	unit_price	quantity_in_stock
7	Fiction Book	4	2	9.99	300
NULL	NULL	NULL	NULL	NULL	NULL

13. Get the category with the most products.

```
SELECT category_id
FROM Products
GROUP BY category_id
ORDER BY COUNT(*) DESC
LIMIT 1;
```

Result Grid | Filter Rows:

	category_id
▶	1

14. Find the supplier with the most products.

```
SELECT supplier_id
FROM Products
GROUP BY supplier_id
ORDER BY COUNT(*) DESC
LIMIT 1;
```

Result Grid | Filter Rows

	supplier_id
▶	2

15. Get products with a quantity greater than the average quantity.

SELECT * FROM Products WHERE quantity_in_stock > (SELECT AVG(quantity_in_stock) FROM Products);

Result Grid | Filter Rows: | Edit: | Export/Import:

product_id	product_name	category_id	supplier_id	unit_price	quantity_in_stock
3	T-shirt	2	2	19.99	200
4	Jeans	2	2	39.99	150
7	Fiction Book	4	2	9.99	300
NULL	NULL	NULL	NULL	NULL	NULL

16. Find the total number of orders.

SELECT COUNT(*) AS total_orders FROM Orders;

Result Grid | Filter Rows:

total_orders
9

17. Get the most recent order date.

SELECT MAX(order_date) AS last_order_date FROM Orders;

Result Grid | Filter Rows:

last_order_date
2024-02-20

18. List orders with product names.

SELECT o.order_id, p.product_name, o.quantity_ordered, o.order_date

FROM Orders o

JOIN Products p ON o.product_id = p.product_id;

Result Grid | Filter Rows: | Export: | Wrap Cell

order_id	product_name	quantity_ordered	order_date
1	Laptop	2	2024-01-10
2	Smartphone	5	2024-01-15
3	Jeans	3	2024-01-20
4	T-shirt	10	2024-01-25
5	Blender	1	2024-01-30
6	Microwave	2	2024-02-05
7	Laptop	1	2024-02-10
8	Smartphone	4	2024-02-15
9	Coffee Table	1	2024-02-20

19. Find products that have been ordered more than 1 times.

```
SELECT p.product_name, COUNT(o.order_id) AS order_count
FROM Products p
JOIN Orders o ON p.product_id = o.product_id
GROUP BY p.product_name
HAVING COUNT(o.order_id) > 1;
```

Result Grid | Filter Rows:

product_name	order_count
Laptop	2
Smartphone	2

20. Get the total revenue generated from orders.

```
SELECT SUM(p.unit_price * o.quantity_ordered) AS total_revenue
FROM Orders o
JOIN Products p ON o.product_id = p.product_id;
```

Result Grid | Filter Rows:

total_revenue
9169.71

21. List products sorted by quantity in stock descending.

SELECT * FROM Products ORDER BY quantity_in_stock DESC;

Result Grid | Filter Rows: | Edit: | Export/Import:

product_id	product_name	category_id	supplier_id	unit_price	quantity_in_stock
7	Fiction Book	4	2	9.99	300
3	T-shirt	2	2	19.99	200
4	Jeans	2	2	39.99	150
2	Smartphone	1	1	599.99	100
5	Blender	3	3	49.99	75
1	Laptop	1	1	999.99	50
6	Microwave	3	3	99.99	30
8	Coffee Table	5	3	199.99	20
NULL	NULL	NULL	NULL	NULL	NULL

22. Find the cheapest product in each category.

SELECT c.category_name, MIN(p.unit_price) AS cheapest_product

FROM Categories c

JOIN Products p ON c.category_id = p.category_id

GROUP BY c.category_name;

Result Grid | Filter Rows:

category_name	cheapest_product
Electronics	599.99
Clothing	19.99
Home Appliances	49.99
Books	9.99
Furniture	199.99

23. Get suppliers with no products.

```
SELECT s.supplier_name
FROM Suppliers s
LEFT JOIN Products p ON s.supplier_id = p.supplier_id
WHERE p.product_id IS NULL;
```

Result Grid | Filter Row

	supplier_name

24. List all orders from a specific date.

```
SELECT * FROM Orders WHERE order_date = '2024-01-15';
```

Result Grid | Filter Rows: | Edit:

	order_id	product_id	quantity_ordered	order_date
▶	2	2	5	2024-01-15
*	NULL	NULL	NULL	NULL

25. Find the top-selling product.

```
SELECT p.product_name, SUM(o.quantity_ordered) AS total_sold
FROM Products p
JOIN Orders o ON p.product_id = o.product_id
GROUP BY p.product_name
ORDER BY total_sold DESC
LIMIT 1;
```

Result Grid | Filter Rows:

product_name	total_sold
T-shirt	10

26. List products with a stock level below a certain threshold.

```
SELECT * FROM Products WHERE quantity_in_stock < 50;
```

Result Grid | Filter Rows: | Edit: | Export/Import:

product_id	product_name	category_id	supplier_id	unit_price	quantity_in_stock
6	Microwave	3	3	99.99	30
8	Coffee Table	5	3	199.99	20
NULL	NULL	NULL	NULL	NULL	NULL

27. List all unique product categories.

SELECT DISTINCT category_id, category_name FROM Categories;

Result Grid | Filter Rows:

category_id	category_name
1	Electronics
2	Clothing
3	Home Appliances
4	Books
5	Furniture
NULL	NULL

28. Count how many orders were placed in February 2024.

SELECT COUNT(*) AS february_orders FROM Orders WHERE order_date BETWEEN '2024-02-01' AND '2024-02-29';

Result Grid | Filter Rows:

february_orders
4

29. Get the product names along with their unit prices.

SELECT product_name, unit_price FROM Products;

Result Grid | Filter Rows:

product_name	unit_price
Laptop	999.99
Smartphone	599.99
T-shirt	19.99
Jeans	39.99
Blender	49.99
Microwave	99.99
Fiction Book	9.99
Coffee Table	199.99

30. List products that belong to the 'Electronics' category.

SELECT p.product_name FROM Products p

JOIN Categories c ON p.category_id = c.category_id

WHERE c.category_name = 'Electronics';

Result Grid | Filter Rows:

product_name
Laptop
Smartphone

31. Find all products supplied by 'Supplier C'.

```
SELECT p.product_name FROM Products p

WHERE p.supplier_id = (SELECT supplier_id FROM Suppliers WHERE
supplier_name = 'Supplier C');
```

Result Grid | Filter Rows:

product_name
Blender
Microwave
Coffee Table

32. Count the number of orders placed for each product.

```
SELECT p.product_name, COUNT(o.order_id) AS order_count

FROM Products p

LEFT JOIN Orders o ON p.product_id = o.product_id

GROUP BY p.product_name;
```

Result Grid | Filter Rows:

product_name	order_count
Laptop	2
Smartphone	2
T-shirt	1
Jeans	1
Blender	1
Microwave	1
Fiction Book	0
Coffee Table	1

33. Find products with a unit price greater than $50.

SELECT * FROM Products WHERE unit_price > 50;

Result Grid | Filter Rows: | Edit: | Export/Import:

product_id	product_name	category_id	supplier_id	unit_price	quantity_in_stock
1	Laptop	1	1	999.99	50
2	Smartphone	1	1	599.99	100
6	Microwave	3	3	99.99	30
8	Coffee Table	5	3	199.99	20
NULL	NULL	NULL	NULL	NULL	NULL

34. Find the latest product added (highest product ID).

SELECT * FROM Products WHERE product_id = (SELECT MAX(product_id) FROM Products);

Result Grid | Filter Rows: | Edit: | Export/Import: | Wr

product_id	product_name	category_id	supplier_id	unit_price	quantity_in_stock
8	Coffee Table	5	3	199.99	20
NULL	NULL	NULL	NULL	NULL	NULL

35. Find products that are out of stock.

SELECT * FROM Products WHERE quantity_in_stock = 0;

Result Grid | Filter Rows: | Edit: | Export/Import:

product_id	product_name	category_id	supplier_id	unit_price	quantity_in_stock
NULL	NULL	NULL	NULL	NULL	NULL

36. Get the total revenue generated from 'Electronics' products.

```
SELECT SUM(p.unit_price * o.quantity_ordered) AS electronics_revenue
FROM Orders o
JOIN Products p ON o.product_id = p.product_id
WHERE p.category_id = (SELECT category_id FROM Categories WHERE category_name = 'Electronics');
```

Result Grid | Filter Rows:

electronics_revenue
8399.88

37. List products that have a quantity greater than 20 and a unit price less than $50.

```
SELECT * FROM Products WHERE quantity_in_stock > 20 AND unit_price < 50;
```

Result Grid | Filter Rows: | Edit: | Export/Import:

product_id	product_name	category_id	supplier_id	unit_price	quantity_in_stock
3	T-shirt	2	2	19.99	200
4	Jeans	2	2	39.99	150
5	Blender	3	3	49.99	75
7	Fiction Book	4	2	9.99	300
NULL	NULL	NULL	NULL	NULL	NULL

38. Find the total quantity of orders per day.

```
SELECT order_date, SUM(quantity_ordered) AS total_quantity
FROM Orders
GROUP BY order_date;
```

Result Grid | Filter Rows:

order_date	total_quantity
2024-01-10	2
2024-01-15	5
2024-01-20	3
2024-01-25	10
2024-01-30	1
2024-02-05	2
2024-02-10	1
2024-02-15	4
2024-02-20	1

39. Count the number of products in each supplier inventory.

```
SELECT s.supplier_name, COUNT(p.product_id) AS product_count
FROM Suppliers s
LEFT JOIN Products p ON s.supplier_id = p.supplier_id
GROUP BY s.supplier_name;
```

Result Grid | Filter Rows:

supplier_name	product_count
Supplier A	2
Supplier B	3
Supplier C	3

40. Find the supplier with the lowest unit price product.

```
SELECT s.supplier_name, MIN(p.unit_price) AS lowest_price
FROM Suppliers s
JOIN Products p ON s.supplier_id = p.supplier_id
GROUP BY s.supplier_name
ORDER BY lowest_price ASC
LIMIT 1;
```

Result Grid | Filter Rows:

supplier_name	lowest_price
Supplier B	9.99

41. List all orders and their corresponding quantities and dates.

```
SELECT o.order_id, o.quantity_ordered, o.order_date
FROM Orders o;
```

Result Grid | Filter Rows:

order_id	quantity_ordered	order_date
1	2	2024-01-10
2	5	2024-01-15
3	3	2024-01-20
4	10	2024-01-25
5	1	2024-01-30
6	2	2024-02-05
7	1	2024-02-10
8	4	2024-02-15
9	1	2024-02-20
NULL	NULL	NULL

42. View for Total Stock Value by Product

```
CREATE VIEW ProductStockValue AS
SELECT product_name, quantity_in_stock, unit_price,
    (quantity_in_stock * unit_price) AS stock_value
FROM Products;
```

Result Grid | Filter Rows: | Export: | Wr

product_name	quantity_in_stock	unit_price	stock_value
Laptop	50	999.99	49999.50
Smartphone	100	599.99	59999.00
T-shirt	200	19.99	3998.00
Jeans	150	39.99	5998.50
Blender	75	49.99	3749.25
Microwave	30	99.99	2999.70
Fiction Book	300	9.99	2997.00
Coffee Table	20	199.99	3999.80

43. View for Total Orders by Product

```
CREATE VIEW ProductOrderSummary AS
SELECT p.product_name, SUM(o.quantity_ordered) AS total_orders
FROM Products p
LEFT JOIN Orders o ON p.product_id = o.product_id
GROUP BY p.product_name;
```

Result Grid | Filter Rows:

product_name	total_orders
Laptop	3
Smartphone	9
T-shirt	10
Jeans	3
Blender	1
Microwave	2
Fiction Book	NULL
Coffee Table	1

44. Trigger to Update Stock After an Order is Placed

```
delimiter //
CREATE TRIGGER UpdateStockAfterOrder
AFTER INSERT ON Orders
FOR EACH ROW
BEGIN
   UPDATE Products
   SET quantity_in_stock = quantity_in_stock - NEW.quantity_ordered
   WHERE product_id = NEW.product_id;
END;
```

Result Grid | Filter Rows: | Edit: | Export/Import:

product_id	product_name	category_id	supplier_id	unit_price	quantity_in_stock
1	Laptop	1	1	999.99	50
2	Smartphone	1	1	599.99	100
3	T-shirt	2	2	19.99	200
4	Jeans	2	2	39.99	150
5	Blender	3	3	49.99	75
6	Microwave	3	3	99.99	30
7	Fiction Book	4	2	9.99	300
8	Coffee Table	5	3	199.99	20
NULL	NULL	NULL	NULL	NULL	NULL

45. Cursor to Display Low Stock Products

```
DROP PROCEDURE  ShowLowStockProducts();

DELIMITER //

CREATE PROCEDURE LowStockProducts()

BEGIN

   DECLARE done INT DEFAULT FALSE;

   DECLARE prod_name VARCHAR(100);

   DECLARE stock_quantity INT;


   DECLARE low_stock_cursor CURSOR FOR

      SELECT product_name, quantity_in_stock

      FROM Products

      WHERE quantity_in_stock < 20;


   DECLARE CONTINUE HANDLER FOR NOT FOUND SET done = TRUE;


   OPEN low_stock_cursor;


   read_loop: LOOP

      FETCH low_stock_cursor INTO prod_name, stock_quantity;

      IF done THEN

         LEAVE read_loop;

      END IF;

      SELECT CONCAT('Product: ', prod_name, ', Stock: ', stock_quantity) AS
LowStockProducts;

   END LOOP;


   CLOSE low_stock_cursor;

END //

DELIMITER ;

call  LowStockProducts()
```

46. Get the Supplier of the Most Expensive Product

```
SELECT s.supplier_name
FROM Suppliers s
WHERE s.supplier_id = (
    SELECT supplier_id
    FROM Products
    WHERE unit_price = (SELECT MAX(unit_price) FROM Products)
);
```

Result Grid | Filter Rows:

supplier_name
Supplier A

47. Get Products Ordered on a Specific Date

```
SELECT *
FROM Products
WHERE product_id IN (
    SELECT product_id
    FROM Orders
    WHERE order_date = '2024-01-15'
);
```

Result Grid | Filter Rows: | Edit: | Export/Import:

product_id	product_name	category_id	supplier_id	unit_price	quantity_in_stock
2	Smartphone	1	1	599.99	100
NULL	NULL	NULL	NULL	NULL	NULL

48. Total Revenue Generated by Each Supplier

```
SELECT s.supplier_name, SUM(p.unit_price * o.quantity_ordered) AS total_revenue

FROM Suppliers s

JOIN Products p ON s.supplier_id = p.supplier_id

JOIN Orders o ON p.product_id = o.product_id

GROUP BY s.supplier_name;
```

Result Grid | Filter Rows:

supplier_name	total_revenue
Supplier A	8399.88
Supplier B	319.87
Supplier C	449.96

49. Find Products Below Average Stock

```
SELECT * FROM Products

WHERE quantity_in_stock < (SELECT AVG(quantity_in_stock) FROM Products);
```

Result Grid | Filter Rows: | Edit: | Export/Import: | W

product_id	product_name	category_id	supplier_id	unit_price	quantity_in_stock
1	Laptop	1	1	999.99	50
2	Smartphone	1	1	599.99	100
5	Blender	3	3	49.99	75
6	Microwave	3	3	99.99	30
8	Coffee Table	5	3	199.99	20
NULL	NULL	NULL	NULL	NULL	NULL

50. List products with their corresponding supplier names.

```
SELECT p.product_name, s.supplier_name
FROM Products p
JOIN Suppliers s ON p.supplier_id = s.supplier_id;
```

Result Grid Filter Rows:

product_name	supplier_name
Laptop	Supplier A
Smartphone	Supplier A
T-shirt	Supplier B
Jeans	Supplier B
Fiction Book	Supplier B
Blender	Supplier C
Microwave	Supplier C
Coffee Table	Supplier C