Business Questions:

SELECT \* FROM sales

-- 1.   Which region has the highest total revenue?

SELECT

    Region,

    ROUND(SUM(Total\_Sale\_Amount), 2) AS TotalRevenue

FROM Sales

GROUP BY Region

ORDER BY TotalRevenue DESC

LIMIT 1;

-- 2.   Which product category generates the highest revenue on average per sale?

SELECT

    Product\_Category,

    ROUND(AVG(Total\_Sale\_Amount), 2) AS Avg\_Revenue\_Per\_Sale

FROM Sales

GROUP BY Product\_Category

ORDER BY Avg\_Revenue\_Per\_Sale DESC

LIMIT 1;

-- 3.   What is the return rate per product category?

SELECT

    Product\_Category,

    ROUND(SUM(CASE WHEN Returned = 'Yes' THEN 1 ELSE 0 END) \* 100.0 / COUNT(\*), 2) AS ReturnRatePercentage

FROM Sales

GROUP BY Product\_Category

ORDER BY ReturnRatePercentage DESC;

-- 4.   Identify the top 5 products with the highest total sales by quantity.

SELECT

    Product\_ID,

    SUM(Quantity\_Sold) AS TotalQuantitySold

FROM Sales

GROUP BY Product\_ID

ORDER BY TotalQuantitySold DESC

LIMIT 5;

-- 5.   Which store has the lowest revenue but highest number of sales?

SELECT

    Store\_ID,

    ROUND(SUM(Total\_Sale\_Amount),2) AS TotalRevenue,

    COUNT(Sale\_ID) AS NumberOfSales

FROM Sales

GROUP BY Store\_ID

ORDER BY NumberOfSales DESC, TotalRevenue ASC;

-- Using CTE

-- 5.   Which store has the lowest revenue but highest number of sales?

WITH StoreStats AS (

    SELECT

        Store\_ID,

        ROUND(SUM(Total\_Sale\_Amount), 2) AS TotalRevenue,

        COUNT(Sale\_ID) AS NumberOfSales,

        RANK() OVER (ORDER BY COUNT(Sale\_ID) DESC) AS SalesRank,

        RANK() OVER (ORDER BY SUM(Total\_Sale\_Amount) ASC) AS RevenueRank

    FROM Sales

    GROUP BY Store\_ID

)

SELECT \*

FROM StoreStats

ORDER BY SalesRank ASC, RevenueRank ASC

LIMIT 1;

-- 6.   How do different payment methods impact total revenue?

SELECT

    Payment\_Method,

    ROUND(SUM(Total\_Sale\_Amount), 2) AS TotalRevenue

FROM Sales

GROUP BY Payment\_Method

ORDER BY TotalRevenue DESC;

-- 7.   Which customers have made the most purchases in terms of total amount spent?

SELECT

    Customer\_ID,

    ROUND(SUM(Total\_Sale\_Amount), 2) AS TotalSpent

FROM Sales

GROUP BY Customer\_ID

ORDER BY TotalSpent DESC

LIMIT 10;

-- 8.   Which quarter sees the highest sales?

SELECT

    CASE

        WHEN MONTH(Sale\_Date) IN (1, 2, 3) THEN 'Q1'

        WHEN MONTH(Sale\_Date) IN (4, 5, 6) THEN 'Q2'

        WHEN MONTH(Sale\_Date) IN (7, 8, 9) THEN 'Q3'

        ELSE 'Q4'

    END AS Quarter,

    ROUND(SUM(Total\_Sale\_Amount), 2) AS TotalSales

FROM Sales

GROUP BY Quarter

ORDER BY TotalSales DESC;

-- Finding Error in Sale\_Date

SELECT Sale\_Date FROM Sales LIMIT 10;

-- Test Converting date Format

SELECT

    Sale\_Date,

    STR\_TO\_DATE(Sale\_Date, '%c/%e/%Y') AS ConvertedDate

FROM Sales

LIMIT 10;

-- Cornvarting Date Format

-- Create a column name Sale\_Date\_New

ALTER TABLE Sales ADD COLUMN Sale\_Date\_New DATE;

-- Converting Date Format and Update the new column

UPDATE Sales

SET Sale\_Date\_New = STR\_TO\_DATE(Sale\_Date, '%c/%e/%Y')

-- Validate no NULLs

WHERE STR\_TO\_DATE(Sale\_Date, '%c/%e/%Y') IS NULL;

-- Verify the Update

SELECT Sale\_Date, Sale\_Date\_New FROM Sales LIMIT 10;

-- Remove old column and Rename the new column

ALTER TABLE Sales DROP COLUMN Sale\_Date;

ALTER TABLE Sales RENAME COLUMN Sale\_Date\_New TO Sale\_Date;

-- 8.   Which quarter sees the highest sales? (Using QUARTER function)

SELECT

    CONCAT('Q', QUARTER(Sale\_Date)) AS Quarter,

    ROUND(SUM(Total\_Sale\_Amount), 2) AS TotalSales

FROM Sales

GROUP BY Quarter

ORDER BY TotalSales DESC;

-- 9.   What is the average unit price per product category?

SELECT

    Product\_Category,

    ROUND(AVG(Unit\_Price), 2) AS AverageUnitPrice

FROM Sales

GROUP BY Product\_Category

ORDER BY AverageUnitPrice DESC;

-- 10.  Which product categories have the highest return percentage?

SELECT

    Product\_Category,

    ROUND(SUM(CASE WHEN Returned = 'Yes' THEN 1 ELSE 0 END) \* 100.0 / COUNT(\*), 2) AS ReturnPercentage

FROM Sales

GROUP BY Product\_Category

ORDER BY ReturnPercentage DESC;

Ad hoc Queries:

--1. Region-wise Average Order Value (AOV)

SELECT

    Region,

    ROUND(SUM(Total\_Sale\_Amount) / COUNT(DISTINCT Sale\_ID), 2) AS Avg\_Order\_Value

FROM Sales

GROUP BY Region

ORDER BY Avg\_Order\_Value DESC;

--2. Region-wise return rate

 SELECT Region,

    ROUND(SUM(CASE WHEN Returned = 'Yes' THEN 1 ELSE 0 END) \* 100.0 / COUNT(\*), 2) AS ReturnRate

FROM Sales

GROUP BY Region

ORDER BY ReturnRate DESC;

--3. Product Category-wise Return vs Revenue Ratio

SELECT

    Product\_Category,

    SUM(CASE WHEN Returned = 'Yes' THEN 1 ELSE 0 END) AS Total\_Returns,

    ROUND(SUM(Total\_Sale\_Amount), 2) AS Total\_Revenue,

    ROUND((SUM(CASE WHEN Returned = 'Yes' THEN 1 ELSE 0 END) \* 100.0 / COUNT(\*)), 2) AS Return\_Percentage

FROM Sales

GROUP BY Product\_Category

ORDER BY Return\_Percentage DESC;

--4. Payment Method Preference by Region

SELECT

    Region,

    Payment\_Method,

    COUNT(Sale\_ID) AS Total\_Transactions

FROM Sales

GROUP BY Region, Payment\_Method

ORDER BY Region, Total\_Transactions DESC;

--5. Top 5 Customers by Average Purchase Value

SELECT

    Customer\_ID,

    ROUND(SUM(Total\_Sale\_Amount) / COUNT(DISTINCT Sale\_ID), 2) AS Avg\_Purchase\_Value,

    ROUND(SUM(Total\_Sale\_Amount), 2) AS Total\_Spent

FROM Sales

GROUP BY Customer\_ID

ORDER BY Avg\_Purchase\_Value DESC

LIMIT 5;

--6. Category Performance by Quarter

SELECT

    CONCAT('Q', QUARTER(Sale\_Date)) AS Quarter,

    Product\_Category,

    ROUND(SUM(Total\_Sale\_Amount), 2) AS Total\_Revenue

FROM Sales

GROUP BY Quarter, Product\_Category

ORDER BY Quarter, Total\_Revenue DESC;

--7. Store Performance Efficiency (Revenue per Sale)

SELECT

    Store\_ID,

    ROUND(SUM(Total\_Sale\_Amount) / COUNT(DISTINCT Sale\_ID), 2) AS Revenue\_Per\_Sale

FROM Sales

GROUP BY Store\_ID

ORDER BY Revenue\_Per\_Sale DESC;

--8. Returned Items Trend Over Time

SELECT

    DATE\_FORMAT(Sale\_Date, '%Y-%m') AS Month,

    SUM(CASE WHEN Returned = 'Yes' THEN 1 ELSE 0 END) AS Returned\_Items

FROM Sales

GROUP BY Month

ORDER BY Month;

--9. Return Rate by Payment Method

SELECT

    Payment\_Method,

    ROUND(SUM(CASE WHEN Returned = 'Yes' THEN 1 ELSE 0 END) \* 100.0 / COUNT(\*), 2) AS ReturnRate

FROM Sales

GROUP BY Payment\_Method

ORDER BY ReturnRate DESC;