SQL INTERVIEW QUESTIONS

DIFFICULTY - MEDIUM

ABHINAV SINGH

Question 1.

Write a query to find the top 5 products with the highest revenue in each category.

Products	Sales
ProductID: INT	SaleID: INT
Name: VARCHAR(100)	ProductID: INT
CategoryID: INT	Amount: DECIMAL(10, 2)

Solution :

```sql
WITH ProductRevenue AS (
    SELECT p.ProductID,
           p.Name,
           p.CategoryID,
           SUM(s.Amount) AS TotalRevenue,
           RANK() OVER (PARTITION BY p.CategoryID ORDER BY SUM(s.Amount)
DESC) AS RevenueRank
    FROM Products p
    JOIN Sales s ON p.ProductID = s.ProductID
    GROUP BY p.ProductID, p.Name, p.CategoryID
)
SELECT ProductID, Name, CategoryID, TotalRevenue
FROM ProductRevenue
WHERE RevenueRank <= 5;
```

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Question 2.

Identify Employees with Increasing Sales for Four Consecutive Quarters

Sales
EmployeeID: INT
SaleDate: DATE
Amount: DECIMAL(10, 2)

Solution :

```
 WITH QuarterlySales AS (
     SELECT EmployeeID,
            DATE_TRUNC('quarter', SaleDate) AS Quarter,
            SUM(Amount) AS QuarterlyAmount
     FROM Sales
     GROUP BY EmployeeID, DATE_TRUNC('quarter', SaleDate)
 ),
 SalesTrend AS (
     SELECT EmployeeID,
            Quarter,
            QuarterlyAmount,
            LAG(QuarterlyAmount, 1) OVER (PARTITION BY EmployeeID ORDER BY
Quarter) AS PrevQuarter1,
            LAG(QuarterlyAmount, 2) OVER (PARTITION BY EmployeeID ORDER BY
Quarter) AS PrevQuarter2,
            LAG(QuarterlyAmount, 3) OVER (PARTITION BY EmployeeID ORDER BY
Quarter) AS PrevQuarter3
     FROM QuarterlySales
 )
 SELECT EmployeeID, Quarter, QuarterlyAmount
 FROM SalesTrend
 WHERE QuarterlyAmount > PrevQuarter1 AND PrevQuarter1 > PrevQuarter2 AND
PrevQuarter2 > PrevQuarter3;
```

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Question 3.

Find the Third Lowest Price for Each Product Category

Products
ProductID: INT
Name: VARCHAR(100)
CategoryID: INT
Price: DECIMAL(10, 2)

Solution :

```sql
WITH RankedPrices AS (
    SELECT CategoryID,
           Price,
           DENSE_RANK() OVER (PARTITION BY CategoryID ORDER BY Price ASC) AS
PriceRank
    FROM Products
)
SELECT CategoryID, Price
FROM RankedPrices
WHERE PriceRank = 3;
```

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Question 4.

Write a query to find the customer with the highest total purchase amount in each region.

Customers
CustomerID: INT
Name: VARCHAR(100)
Region: VARCHAR(50)

Orders
OrderID: INT
CustomerID: INT
Amount: DECIMAL(10, 2)

Solution :

```
WITH CustomerTotals AS (
    SELECT c.CustomerID,
           c.Name,
           c.Region,
           SUM(o.Amount) AS TotalAmount
    FROM Customers c
    JOIN Orders o ON c.CustomerID = o.CustomerID
    GROUP BY c.CustomerID, c.Name, c.Region
),
RankedCustomers AS (
    SELECT CustomerID,
           Name,
           Region,
           TotalAmount,
           RANK() OVER (PARTITION BY Region ORDER BY TotalAmount DESC) AS
RegionRank
    FROM CustomerTotals
)
SELECT CustomerID, Name, Region, TotalAmount
FROM RankedCustomers
WHERE RegionRank = 1;
```

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Question 5.

Calculate the Year-Over-Year Growth in Sales

Sales
SaleID: INT
SaleDate: DATE
Amount: DECIMAL(10, 2)

Solution :

```
WITH YearlySales AS (
    SELECT EXTRACT(YEAR FROM SaleDate) AS SaleYear,
           SUM(Amount) AS TotalSales
    FROM Sales
    GROUP BY EXTRACT(YEAR FROM SaleDate)
),
SalesGrowth AS (
    SELECT SaleYear,
           TotalSales,
           LAG(TotalSales, 1) OVER (ORDER BY SaleYear) AS PreviousYearSales
    FROM YearlySales
)
SELECT SaleYear,
       (TotalSales - PreviousYearSales) / PreviousYearSales * 100 AS
GrowthPercentage
FROM SalesGrowth
WHERE PreviousYearSales IS NOT NULL;
```

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