Here are 15 real-world SQL problem scenarios specifically based on the AdventureWorksdatabase, emphasizing the use of GROUP BY, aggregate functions, and CTEs:

1. Calculate total sales amount per product category

Task: Find the sum of `LineTotal` sales for each product category from sales order details.

2. Find the average employee salary per department

Task: Calculate the average `Rate` from `EmployeePayHistory` grouped by departments where employees currently work.

3. List number of employees hired each year

Task: Count employees grouped by the year part of `HireDate` from `HumanResources.Employee`.

4. Find top 3 products with highest sales per year (using CTE and ROW_NUMBER)

Task: For each year, rank products by total quantity sold and display the top 3 products annually.

5. Calculate total sales per sales territory having sales above $1 million

Task: Sum sales `TotalDue` grouped by `SalesTerritory.Name`, filtered on total > 1,000,000.

6. Identify customers who placed more than 5 orders and their total amount spent

Task: From `SalesCustomer` and `SalesOrderHeader`, count number of orders and total `TotalDue`per customer having more than 5 orders.

7. For each vendor, find number of products supplied and average product list price

Task: Group by `Vendor.Name` and compute count of products and average `ListPrice` from `ProductVendor` and `Product`.

8. Calculate monthly revenue for last 12 months

Task: Sum `TotalDue` grouped by month for the last 12 months in `SalesOrderHeader`.

9. Find employees whose total sales exceed their department's average sales (using CTE)

Task: Calculate total sales per employee, average sales by department, and find employees exceeding their department average.

10. List products and total quantity sold, ordered descending by quantity

Task: Sum `OrderQty` from `SalesOrderDetail` grouped by product, ordered by total quantity descending.

11. Find number of orders and total sales for each salesperson in last quarter

Task: Filter orders from the last quarter, group by `SalesPersonID`, count orders and sum `TotalDue`.

12. Determine average order value per customer country

Task: Join `Customer`, `SalesOrderHeader`, and `Address`, group by country, find average order `TotalDue`.

13. Find yearly growth in total sales compared to previous year (with CTE + LAG)

Task: Aggregate total sales yearly, then use LAG() window function to calculate growth from year to year.

14. List departments with highest number of managers

Task: Count employees with `JobTitle` containing 'Manager' grouped by department, order by highest count.

15. Calculate retention rate of customers year-over-year (advanced with CTEs)

Task: Use CTEs to identify customers with orders in consecutive years and compute retention percentage per year.
If you want, I can also provide the exact SQL queries for these scenarios on AdventureWorks. Would you like me to provide the code as well?