

# Querying with Transact-SQL

## Lab 8 – Grouping Sets and Pivoting Data

### Overview

In this lab, you will use grouping sets and the PIVOT operator to summarize data in the **AdventureWorksLT** database.

Before starting this lab, you should view **Module 8 – Grouping Sets and Pivoting Data** in the Course *Querying with Transact-SQL*. Then, if you have not already done so, follow the instructions in the **Getting Started** document for this course to set up the lab environment.

If you find some of the challenges difficult, don't worry – you can find suggested solutions for all of the challenges in the **Lab Solution** folder for this module.

### What You'll Need

- An Azure SQL Database instance with the **AdventureWorksLT** sample database. Review the **Getting Started** document for information about how to provision this.

### Challenge 1: Retrieve Regional Sales Totals

Adventure Works sells products to customers in multiple country/regions around the world.

#### 1. Retrieve totals for country/region and state/province

**Tip:** Review the documentation for [GROUP BY](#) in the Transact-SQL Language Reference.

An existing report uses the following query to return total sales revenue grouped by country/region and state/province.

```
SELECT a.CountryRegion, a.StateProvince, SUM(soh.TotalDue) AS Revenue
FROM SalesLT.Address AS a
JOIN SalesLT.CustomerAddress AS ca ON a.AddressID = ca.AddressID
JOIN SalesLT.Customer AS c ON ca.CustomerID = c.CustomerID
JOIN SalesLT.SalesOrderHeader as soh ON c.CustomerID = soh.CustomerID
GROUP BY a.CountryRegion, a.StateProvince
ORDER BY a.CountryRegion, a.StateProvince;
```

You have been asked to modify this query so that the results include a grand total for all sales revenue and a subtotal for each country/region in addition to the state/province subtotals that are already returned.

## 2. Indicate the grouping level in the results

**Tip:** Review the documentation for the [GROUPING ID](#) function in the Transact-SQL Language Reference.

Modify your query to include a column named `Level` that indicates at which level in the total, country/region, and state/province hierarchy the revenue figure in the row is aggregated. For example, the grand total row should contain the value 'Total', the row showing the subtotal for United States should contain the value 'United States Subtotal', and the row showing the subtotal for California should contain the value 'California Subtotal'.

## 3. Add a grouping level for cities

Extend your query to include a grouping for individual cities.

## Challenge 2: Retrieve Customer Sales Revenue by Category

Adventure Works products are grouped into categories, which in turn have parent categories (defined in the `SalesLT.vGetAllCategories` view). Adventure Works customers are retail companies, and they may place orders for products of any category. The revenue for each product in an order is recorded as the `LineTotal` value in the `SalesLT.SalesOrderDetail` table.

### 1. Retrieve customer sales revenue for each parent category

**Tip:** Review the documentation for the PIVOT operator in the [FROM clause](#) syntax in the Transact-SQL language reference.

Retrieve a list of customer company names together with their total revenue for each parent category in *Accessories*, *Bikes*, *Clothing*, and *Components*.

## Next Steps

Well done! You've completed the lab, and you're ready to learn how to insert, update, and delete data in **Module 9 – Modifying Data** in the *Course Querying with Transact-SQL*.