06 | Using Subqueries and APPLY

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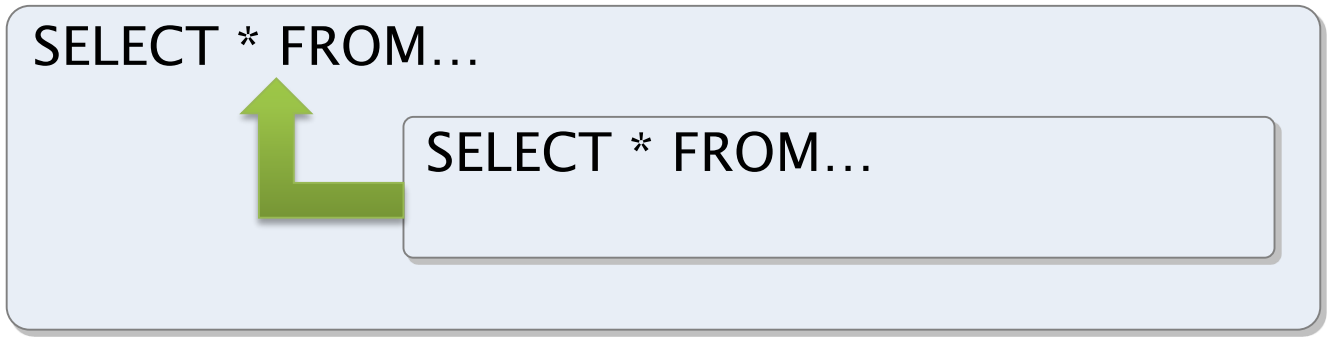
Module Overview

- Introduction to Subqueries
- Scalar or Multi-Valued?
- Self-Contained or Correlated?
- Using APPLY with Table-Valued Functions

Introduction to Subqueries

- Subqueries are nested queries: queries within queries
- Results of inner query passed to outer query
  - Inner query acts like an expression from perspective of outer query



Scalar or Multi-Valued?

- Scalar subquery returns single value to outer query
  - Can be used anywhere single-valued expression is used: SELECT, WHERE, and so on
- Multi-valued subquery returns multiple values as a single column set to the outer query
  - Used with IN predicate

```
SELECT orderid, productid, unitprice, qty
FROM Sales.OrderDetails
WHERE orderid =
      (SELECT MAX(orderid) AS lastorder
      FROM Sales.Orders);
```

```
SELECT custid, orderid
FROM Sales.orders
WHERE custid IN (
      SELECT custid
      FROM Sales.Customers
      WHERE countryregion = N'Mexico');
```

DEMO

Using Subqueries

Self-Contained or Correlated?

- Most subqueries are self-contained and have no connection with the outer query other than passing it results
- Correlated subqueries refer to elements of tables used in outer query
  - Dependent on outer query, cannot be executed separately
  - Behaves as if inner query is executed once per outer row
  - May return scalar value or multiple values

```
SELECT orderid, empid, orderdate
FROM Sales.Orders AS O1
WHERE orderdate = (SELECT MAX(orderdate)
                   FROM Sales.Orders AS O2
                   WHERE O2.empid = O1.empid)
ORDER BY empid, orderdate;
```

DEMO

Creating a Correlated Subquery

Using APPLY with Table-Valued Functions

- CROSS APPLY applies the right table expression to each row in left table
  - Conceptually similar to CROSS JOIN between two tables but can correlate data between sources

```
SELECT S.supplierid, s.companyname, P.productid,  P.productname, P.unitprice
FROM Production.Suppliers AS S
CROSS APPLY dbo.fn_TopProductsByShipper(S.supplierid) AS P
```

- OUTER APPLY adds rows for those with NULL in columns for right table
  - Conceptually similar to LEFT OUTER JOIN between two tables

DEMO

Using APPLY with Table-Valued Functions

Using Subqueries and APPLY

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- Lab: Using Subqueries and APPLY

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