

Lecture Notes – Sub Queries-WHERE Clause

Section 1: Lecture Summary

Subqueries in the **where clause** can return scalar or list results for filtering main queries. Examples include finding employees with salary greater than the maximum in marketing department (using scalar subquery), customers who have never placed an order (using **NOT IN** with list subquery), and products from other categories priced higher than any home appliance product (using **> ANY** with list subquery). Approach: design subquery first, then integrate into main query.

Section 2: Key Concepts and Explanations

Subqueries nest inside the **where clause** of a main query to provide dynamic values for conditions. They return either a **scalar result** (single value, e.g., MAX salary) or **list result** (multiple values, e.g., customer IDs or prices). Use operators like **>** for scalars, **NOT IN** for excluding lists, and **> ANY** for comparing against any value in a list. Design by writing subquery standalone first, then embed in outer query starting from **SELECT**.

Section 3: Example Code and Use Cases

Adapted to eCommerceDB schemas.

Employees with salary > max salary in marketing department (scalar subquery):

```
SELECT EmployeeID, FirstName, LastName, Salary
FROM Employees
WHERE Salary > (SELECT MAX(Salary) FROM Employees WHERE DepartmentID = 4);
```

Customers who have never placed an order (NOT IN with list subquery):

```
SELECT CustomerID, FirstName, LastName
FROM Customers
WHERE CustomerID NOT IN (SELECT CustomerID FROM Orders);
```

Products from other categories priced > any home appliance product (> ANY with list subquery):

```
SELECT ProductID, ProductName, Price
FROM Products
WHERE CategoryID != 3
AND Price > ANY (SELECT Price FROM Products WHERE CategoryID = 3);
```

Section 4: Key Takeaways

- Subqueries in ****where**** enable complex filtering: scalar for single values, lists for ****IN/NOT IN/ANY****.
- Break down: write and test subquery first, then build outer query.
- ****> ANY**** checks against every list value (true if greater than at least one).
- Practice designing subquery independently before embedding.