

Multiple-Row and Multiple-Column Subqueries

Multiple-Row subquery

- Return more than one row (**one column, many rows**)
- Use multiple-row comparison operators

DepartmentID

4

5

Operator	Meaning
IN	Compare a single value with a list of values returned by a subquery and select those equal to any member in the list
ANY	Compare a single value with a list of values returned by a subquery and select only those > (or <) any value in the list
ALL	Compare a single value with a list of values returned by a subquery and select only those > (or <) all values in the list

Multiple-Row subquery

- Find the departments with the most staff working in them. Show all information of these departments.

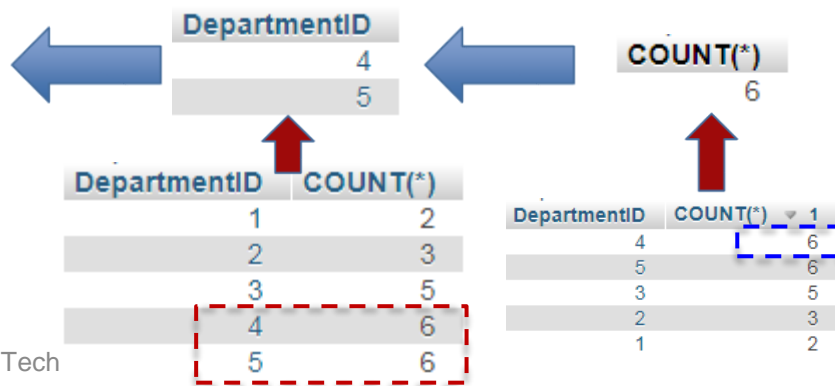
```
SELECT *  
FROM department  
WHERE DepartmentID IN (SELECT Wa.DepartmentID  
                       FROM workallocation AS Wa  
                       GROUP BY Wa.DepartmentID  
                       HAVING COUNT(*) =  
                               (SELECT COUNT(*)  
                                FROM workallocation AS W  
                                GROUP BY W.DepartmentID  
                                ORDER BY COUNT(*) DESC  
                                LIMIT 0,1));
```

DepartmentID	DepartmentName	Budget	ManagerID
4	Accounting	360000	3
5	Human Resource	550000	7



Department table

DepartmentID	DepartmentName	Budget	ManagerID
1	Sales	5005000	2
2	Marketing	509000	1
3	Finance	650000	5
4	Accounting	360000	3
5	Human Resource	550000	7



Multiple-Row subquery

- Find the number of staff working in Sales or Finance department.

```
SELECT Dp.DepartmentID, Dp.DepartmentName, COUNT(*)  
FROM workallocation AS WA, department AS Dp  
WHERE WA.DepartmentID = Dp.DepartmentID  
GROUP BY WA.DepartmentID  
HAVING WA.DepartmentID = ANY(SELECT D.DepartmentID  
FROM department AS D  
WHERE D.DepartmentName IN ('Sales','Finance'));
```

DepartmentID	DepartmentName	COUNT(*)
1	Sales	2
3	Finance	5

DepartmentID	DepartmentName	COUNT(*)
1	Sales	2
2	Marketing	3
3	Finance	5
4	Accounting	6
5	Human Resource	6

DepartmentID
1
3

Department table

DepartmentID	DepartmentName	Budget	ManagerID
1	Sales	5005000	2
2	Marketing	509000	1
3	Finance	650000	5
4	Accounting	360000	3
5	Human Resource	550000	7

Multiple-Column Subquery

- The number of columns in the main query must match the number of columns returned from the inner query
- Find the staff who work in the same department as Fred Smith and work the same fraction.

```
SELECT St.StaffID, St.StaffName, Wa.DepartmentID, Wa.PercentageTime
FROM Staff AS St, workallocation AS Wa
WHERE St.StaffID = Wa.StaffID
      AND St.StaffName <> 'Fred Smith'
      AND (Wa.DepartmentID, Wa.PercentageTime)
```

```
= ANY (SELECT W.DepartmentID, W.PercentageTime
      FROM Staff AS S, workallocation AS W
      WHERE S.StaffID = W.StaffID
      AND S.StaffName = 'Fred Smith');
```

StaffID	StaffName	DepartmentID	PercentageTime
3	John Smith	3	0.2



StaffID	StaffName	DepartmentID	PercentageTime
3	John Smith	3	0.2
10	Fred Smith	1	0.4
10	Fred Smith	3	0.2
10	Fred Smith	4	0.2
10	Fred Smith	5	0.1



DepartmentID	PercentageTime
1	0.4
3	0.2
4	0.2
5	0.1



WorkAllocation table

StaffID	DepartmentID	PercentageTime
1	2	0.7
9	4	0.5
9	5	0.5
10	1	0.4
10	3	0.2
10	4	0.2
10	5	0.1

Thank you