Kabeer Ahmed
SE-19028

Database Management System
(DBMS – 204)

Experiment # 06

USING SUB QUERIES

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Roll Number:SE-19028

Maximum Marks	Performance = 05	Viva = 05	Total = 10
Marks Obtained			
Remarks (if any)			

Experiment evaluated by

Instructor Name: Engr. Adiba Jafar

Signature and Date:

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Outcome

After completing this lesson, you should be able to do the following:

1. Describe the types of problem that subqueries can solve
2. Define subqueries
3. List the types of subqueries
4. Write single-row and multiple-row subqueries

Using a Subquery to Solve a Problem

Who has a salary greater than SMITH?
Main Query: Which employees have salaries greater than SMITH'S salary?
Subquery: ?What is SMITH'S salary?

Subquery Syntax

SELECT select_list FROM table WHERE expr operator
(SELECT select_list FROM table);

- The subquery (inner query) executes once before the main query.
- The result of the subquery is used by the main output is used to complete the query condition for the main or outer query.

Using a Subquery

```
SELECT ename FROM   emp
WHERE  sal >(SELECT sal FROM emp WHERE  ename = 'SMITH');
```

Types of Subqueries

1. Single-row subquery
2. Multiple-row subquery Main query

Single-Row Subqueries

1. Return only one row
2. Use single-row comparison operators

Operator	Meaning
=	Equal to
>	Greater than
>=	Greater than or equal to
<	Less than
<=	Less than or equal to
<>	Not equal to

Example
Display the employees whose job ID is the same as that of employee 7369.

```
SELECT ename, job FROM   emp WHERE  job =
(SELECT job FROM   emp WHERE  empno = 7369);
```

```
SELECT ename, job, sal FROM   emp
WHERE  job = (SELECT job FROM   emp WHERE  empno = 7566) AND    sal >
(SELECT sal FROM   emp WHERE  empno = 7499);
```

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Using Group Functions in a Subquery

SELECT ename, job, sal FROM emp WHERE sal =(SELECT MIN(sal)
FROM emp);

The HAVING Clause with Subqueries

- The Oracle Server executes subqueries first.
- The Oracle Server returns results into the HAVING clause of the main query.
-

SELECT deptno, MIN(sal) FROM emp GROUP BY deptno HAVING MIN(sal) > (SELECT MIN(sal) FROM emp WHERE deptno = 20);

Example
Find the job with the lowest average salary.

SELECT job, AVG(sal) FROM emp GROUP BY job HAVING AVG(sal) = (SELECT MIN(AVG(sal)) FROM emp GROUP BY job);

What Is Wrong with This Statement?

SELECT empno, ename FROM emp WHERE sal = (SELECT MIN(sal) FROM emp GROUP BY deptno);
ERROR at line 4:
ORA-01427: single-row subquery returns more than
one row

Will This Statement Return Rows?

SELECT ename, job FROM emp WHERE job= (SELECT job FROM emp
WHERE ename = 'ADAMS');
no rows selected

Multiple-Row Subqueries

- Return more than one row
- Use multiple-row comparison operators

Operator	Meaning
IN	Equal to any member in the list
ANY	Compare value to each value returned by the subquery Compare value to every value returned
ALL	by the subquery

SELECT ename, sal, deptno FROM emp WHERE sal IN (SELECT MIN(sal)
FROM emp GROUP BY deptno);

Example

Find the employees who earn the same salary as the minimum salary for each department. The inner query is executed first, producing a query result. The main query block is then processed and uses the values returned by the inner query to complete its search condition. In fact, the main query would
look like the following to the Oracle Server:
SELECT ename, sal, deptno FROM emp
WHERE sal IN (2500, 4200, 4400, 6000, 7000, 8300, 8600, 17000);

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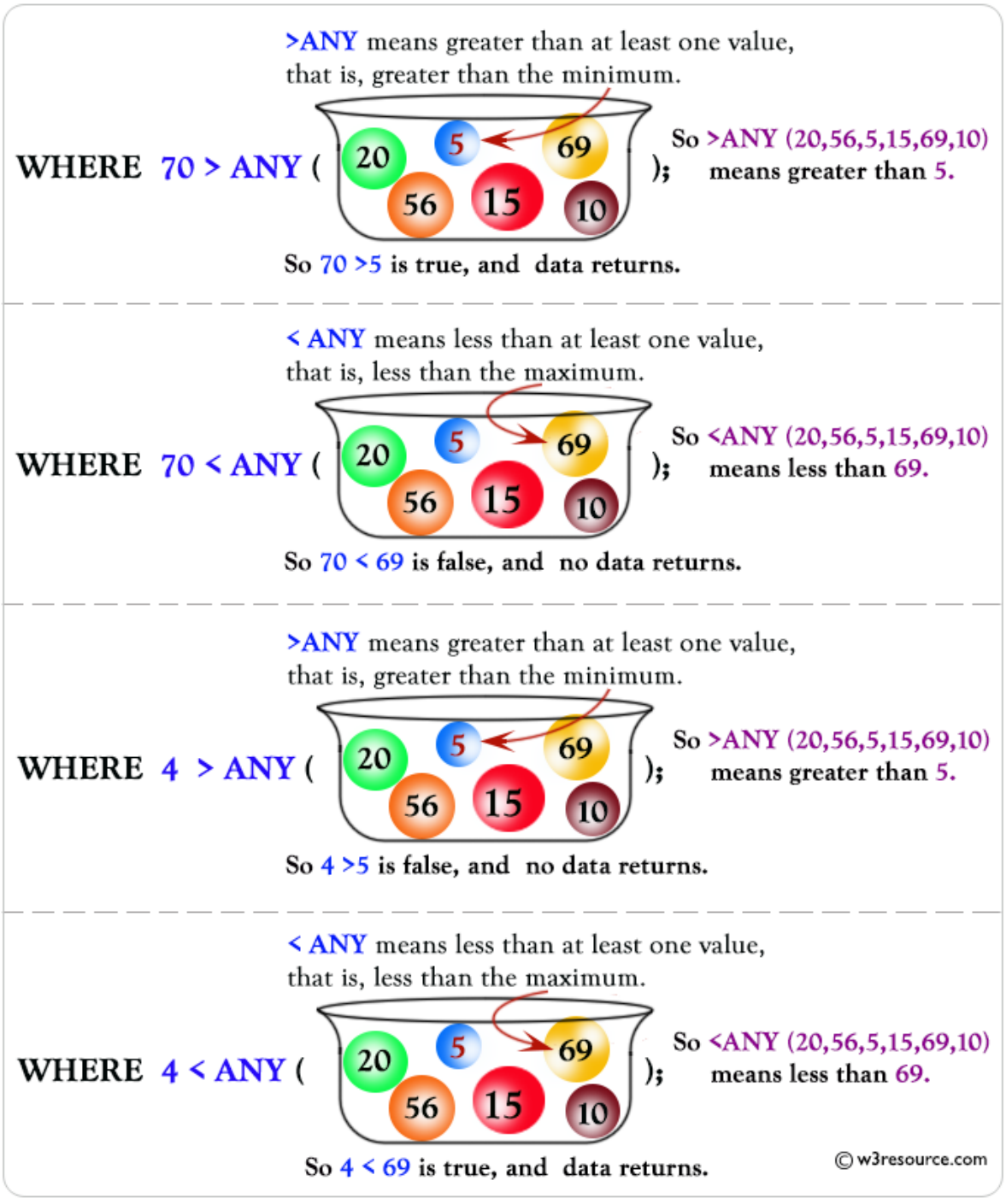
Using the ANY Operator in Multiple-Row Subqueries

Pictorial Presentation: SQL ANY Operator




```
SELECT empno, ename, job, sal FROM   emp
WHERE  sal < ANY (SELECT sal FROM   emp
```

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```
WHERE  job = 'MANAGER') AND    job <> 'MANAGER';
```

Using the ALL Operator in Multiple-Row Subqueries

```
SELECT empno, ename, job, sal
FROM   emp WHERE  sal < ALL(SELECT sal FROM   emp WHERE  job = 'MANAGER')
AND    job <> 'MANAGER';
```

Null Values in a Subquery

```
SELECT emp1.ename
FROM   emp emp1 WHERE  emp1.empno NOT IN(SELECT mgr1.mgr FROM   emp mgr1);
no rows selected
```

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LAB # 06

Using Sub Queries

1.Write a query to display the name and hire date of any employee in the same department as Zlotkey. Exclude Zlotkey.

```
2  SELECT ename, hiredate FROM emp WHERE deptno = (SELECT deptno  FROM emp WHERE ename = 'Zlotkey') AND ename<> 'Zlotkey';
3
4  select * from dept;
```

ENAME	HIREDATE
BLAKE	01-MAY-81
ALLEN	20-FEB-81
WARD	22-FEB-81
MARTIN	28-SEP-81
TURNER	08-SEP-81
JAMES	03-DEC-81
Jamae	03-DEC-81

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7 rows selected.

2. Create a query to display the employee numbers and names of all employees who earn more than the average salary. Sort the results in ascending order of salary.

```
SQL> select empno,ename from emp where sal>(select avg(sal) from emp) order by sal;

     EMPNO ENAME
---------- ----------
      7782 CLARK
      7698 BLAKE
      7566 JONES
      7902 FORD
      7788 SCOTT
      7839 KING

6 rows selected.
```

3. Write a query that displays the employee numbers and names of all employees who work in a department with any employee whose name contains a u. Place your SQL statement in a text file namedlab 6_3.sql. Run your query.

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```
SQL> select empno,ename from emp where deptno IN(select deptno from emp where ename like'%U%');

     EMPNO ENAME
---------- ----------
      7900 JAMES
      7844 TURNER
      7698 BLAKE
      7654 MARTIN
      7521 WARD
      7499 ALLEN

6 rows selected.
```

4. Display the name, department number, and job of all employees whose department number is 1700

No deptno of 1700: so taking 30:

```
1  SELECT ename, deptno, job FROM emp WHERE deptno = (SELECT deptno FROM dept WHERE deptno= 30);
```

ENAME	DEPTNO	JOB
BACKY	30	CLERK
BLAKE	30	MANAGER
ALLEN	30	SALESMAN
WARD	30	SALESMAN
MARTIN	30	SALESMAN
TURNER	30	SALESMAN
JAMES	30	CLERK
Jamae	30	CLERK
Zlotkey	30	MANAGER

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5. Display the name and salary of every employee who reports to Smith.

```
SELECT ename, sal FROM emp WHERE mgr = (SELECT empno FROM emp WHERE ename = 'SMITH');
```

ENAME	SAL
BACKY	2850

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6. Display the department number, name, and job ID for every employee in the Executive department.

```
4  SELECT deptno, ename, job FROM emp WHERE deptno = (SELECT deptno FROM dept WHERE dname = 'Executive');
```

DEPTNO	ENAME	JOB
50	BLAKK	MANAGER

DEPTNO	DNAME	LOC
50	Executive	Australia

7. Modify the query in lab6_3.sql to display the employee numbers, last names, and salaries of all employees who earn more than the average salary and who work in a department with any employee with a u in their name. Resave lab6_3.sql to lab6_7.sql . Run the statement in lab6_7.sql.

```
SQL> SELECT EMPNO,ENAME,SAL FROM EMP WHERE SAL>(SELECT AVG(SAL) FROM EMP) AND DEPTNO IN(SELECT DEPTNO FROM EMP WHERE ENAME LIKE '%U%');

    EMPNO ENAME            SAL
--------- ---------- ----------
     7698 BLAKE            2850
```