Advanced Database

Lecture 3

Basic SQL Queries

➡ **Query 4. Make a list of all project numbers for projects that involve an employee whose last name is 'Smith', either as a worker or as a manager of the department that controls the project**.

(SELECT   DISTINCT   Pnumber

FROM   PROJECT,   DEPARTMENT,   EMPLOYEE

WHERE   Dnum=Dnumber   AND   Mgr_ssn=Ssn   AND   Lname='Smith')

UNION

    (SELECT   DISTINCT   Pnumber

FROM   PROJECT,   WORKS_ON,   EMPLOYEE

WHERE   Pnumber=Pno   AND   Essn=Ssn   AND   Lname='Smith');

Basic SQL Queries

- **Query 12. Retrieve all employees whose address is in Houston, Texas**.

SELECT   Fname, Lname

FROM EMPLOYEE

WHERE Address LIKE '%Houston,TX%';

Basic SQL Queries

Query 12A. Find all employees who were born during the 1950s.

 SELECT Fname, Lname

➡ FROM EMPLOYEE

➡ WHERE Bdate LIKE '_ _ 5 _ _ _ _ _ _ _';

Basic SQL Queries

Query 13. Show the resulting salaries if every employee working on the 'ProductX' project is given a 10 percent raise.

- SELECT E.Fname, E.Lname, 1.1 * E.Salary AS Increased_sal
- FROM EMPLOYEE AS E, WORKS_ON AS W, PROJECT AS P
- WHERE E.Ssn=W.Essn AND W.Pno=P.Pnumber
- AND P.Pname='ProductX';

Basic SQL Queries

Query 14. Retrieve all employees in department 5 whose salary is between $30,000 and $40,000.

- SELECT *
- FROM EMPLOYEE
- WHERE (Salary BETWEEN 30000 AND 40000) AND Dno = 5;
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- The condition (Salary BETWEEN 30000 AND 40000) in Q14 is equivalent to the condition ((Salary >= 30000) AND (Salary <= 40000)).

Basic SQL Queries

Ordering of Query Results

Query 15. Retrieve a list of employees and the projects they are working on, ordered by department and, within each department, ordered alphabetically by last name, then first name.

- SELECT D.Dname, E.Lname, E.Fname, P.Pname
- FROM DEPARTMENT D, EMPLOYEE E, WORKS_ON W, PROJECT P
- WHERE D.Dnumber= E.Dno AND E.Ssn= W.Essn AND W.Pno= P.Pnumber
ORDER BY D.Dname, E.Lname, E.Fname;

Basic SQL Queries

- **The INSERT Command**

- INSERT INTO EMPLOYEE
- VALUES ('Richard', 'K', 'Marini', '653298653', '1962-12-30', '98 Oak Forest, Katy, TX', 'M', 37000, '653298653', 4);

- For example, to enter a tuple for a new EMPLOYEE for whom we know only the Fname, Lname, Dno, and Ssn attributes, we can use :
-     INSERT INTO EMPLOYEE (Fname, Lname, Dno, Ssn)
-     VALUES ('Richard', 'Marini', 4, '653298653');

Basic SQL Queries

- **DELETE command**

- DELETE FROM EMPLOYEE
- WHERE Lname='Brown';

- DELETE FROM EMPLOYEE
- WHERE Ssn='123456789';

- DELETE FROM EMPLOYEE
- WHERE Dno=5;

- DELETE FROM EMPLOYEE;

Basic SQL Queries

➨ **UPDATE Command**

For example, to change the location and controlling department number of project number 10 to 'Bellaire' and 5, respectively, we use U5:

➨ UPDATE PROJECT SET Plocation='Bellaire',
➨ Dnum =5
➨ WHERE Pnumber=10;

Basic SQL Queries

- **Give all employees in the 'Research' department a 10 percent raise in salary**

UPDATE EMPLOYEE

SET Salary = Salary * 1.1

WHERE Dno = 5;

Complex SQL Retrieval Queries

- SQL allows queries that check whether an attribute value is NULL. Rather than using = or < > to compare an attribute value to NULL, SQL uses the comparison operators **IS** or **IS NOT.**

Query 18. Retrieve the names of all employees who do not have supervisors.

- SELECT Fname, Lname
- FROM EMPLOYEE
- WHERE Super_ssn **IS** NULL

Complex SQL Retrieval Queries

- **Query 4. Make a list of all project numbers for projects that involve an employee whose last name is 'Smith', either as a worker or as a manager of the department that controls the project.**

  SELECT DISTINCT Pnumber
  FROM PROJECT
   WHERE Pnumber

 IN

   (SELECT Pnumber
   FROM PROJECT, DEPARTMENT, EMPLOYEE
   WHERE Dnum=Dnumber AND Mgr_ssn=Ssn AND Lname='Smith')

 OR

   Pnumber IN (SELECT Pno
   FROM WORKS_ON, EMPLOYEE
    WHERE Essn=Ssn AND Lname='Smith');

Complex SQL Retrieval Queries

This query will select the Essns of all employees who work the same (project, hours) combination on some project that employee 'John Smith' (whose Ssn = '123456789') works on.

SELECT DISTINCT Essn
   FROM WORKS_ON
    WHERE (Pno, Hours)
IN
   (SELECT Pno, Hours
   FROM WORKS_ON
   WHERE Essn='123456789');