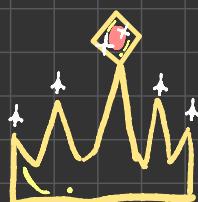


## Basic SQL Retrieval Query Block

```
SELECT <attribute list>
FROM <table list>
[ WHERE <condition> ]
[ ORDER BY <attribute list> ];
```



## Basic Queries

### Basic Retrieval Queries in SQL

- SELECT statement
- One basic statement for retrieving information from a database
- SQL allows a table to have two or more tuples that are identical in all their attribute values
- Unlike relational model (relational model is strictly set-theory based)
- Multiset or bag behavior
- Tuple-id may be used as a key

## กม² cross product

```
Q10: SELECT Ssn, Dname
      FROM EMPLOYEE, DEPARTMENT;
      EM × DP
      SELECT * AS ans;
```

## SELECT \* / ALL

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## SELECT DISTINCT

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## Set operation

ann A-B ต้อง A  
UNION , EXCEPT (ans), INTERSECT

in project number เนื่องจาก Smith

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.

```
Q4A: (SELECT DISTINCT Pnumber
       FROM PROJECT, DEPARTMENT, EMPLOYEE
       WHERE Dnum=Deptno AND Mgr_ssn=Ssn
             AND Lname='Smith')
UNION
( SELECT DISTINCT Pnumber
       FROM PROJECT, WORKS_ON, EMPLOYEE
       WHERE Pnumber=Proj_no AND Esn=Ssn
             AND Lname='Smith');
```

manager

Employee

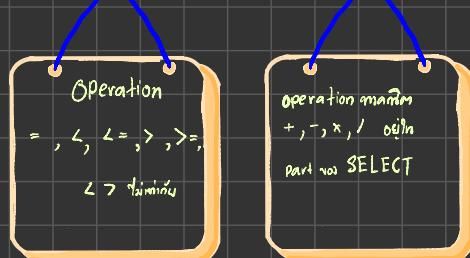
### Basic form of the SELECT statement:

```
SELECT <attribute list>
  FROM <table list>
  [ WHERE <condition> ]
  [ ORDER BY <attribute list> ];
```

▪ <attribute list> is a list of attribute names whose values are to be retrieved by the query.

▪ <table list> is a list of the relation names required to process the query.

▪ <condition> is a conditional (Boolean) expression that identifies the tuples to be retrieved by the query.



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▪ 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';
```

## ไม่ยังดี / ตั้งชื่อ Attribute ได้

attribute names can also be renamed

▪ E.g., in Q14 :

WHERE (Salary BETWEEN 30000 AND 40000) AND Dno = 5

▪ BETWEEN comparison operator

▪ E.g., in Q14 :

WHERE (Salary > 30000 AND Salary < 40000) AND

## ORDER BY

### ▪ Use ORDER BY clause

- Keyword DESC to see result in a descending order of values
- Keyword ASC to specify ascending order explicitly
- Typically placed at the end of the query

ORDER BY D.Dname DESC, E.Lname ASC, E.Fname ASC

## Table Quiz

▪ Query 8. For each employee, retrieve the employee's first and last name and the first and last name of his or her immediate supervisor.

```
SELECT E.Fname, E.lname, S.Fname, S.lname
  FROM EMPLOYEE AS E,EMPLOYEE AS S
 WHERE E.Super_ssn=S.Ssn
```

▪ E.g., in Q14 :

WHERE Address LIKE '%Houston,TX%';

WHERE Ssn LIKE '\_1\_8901';

▪ E.g., in Q14 :

WHERE Address LIKE '%Houston,TX%';

WHERE Ssn LIKE '\_1\_8901';

▪ E.g., in Q14 :

WHERE Address LIKE '%Houston,TX%';

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WHERE Ssn LIKE '\_1\_8901';

▪ E.g., in Q14 :

WHERE Address LIKE '%Houston,TX%';

WHERE Ssn LIKE '\_1\_8901';

▪ E.g., in Q14 :

WHERE Address LIKE '%Houston,TX%';

WHERE Ssn LIKE '\_1\_8901';

▪ E.g., in Q14 :

# Insert

II

## INSERT

- In its simplest form, it is used to add one or more tuples to a relation.
- Attribute values should be listed in the same order as the attributes were specified in the CREATE TABLE command.
- Constraints on data types are observed automatically.
- Any integrity constraints as a part of the DDL specification are enforced.

## Bulk Loading

**EXAMPLE:**  
 CREATE TABLE DSEMPs LIKE EMPLOYEE  
 ( SELECT E\*  
 FROM EMPLOYEE AS E  
 WHERE E.Dno=5  
 )  
 WITH DATA;

U1: INSERT INTO EMPLOYEE  
 VALUES ('Richard', 'K.', 'Marini', '653298653', '1962-12-30', '98  
 Oak Forest, Katy, TX', 'M', 37000, '653298653, 4);  
 Insert "fixed" records

ก่อนมาเก็บข้อมูล

Ins ลงใน table EMPLOYEE (All Attr)

} จุดนี้

Ins ลงใน WORK\_ON\_INFO (Non Attribute)

# Delete

II

## Cascade Deletion

- Removes tuples from a relation
  - Includes a WHERE-clause to select the tuples to be deleted.
  - Referential integrity should be enforced.
  - Tuples are deleted from only **one table** at a time (unless CASCADE is specified on a referential integrity constraint).
  - A missing WHERE-clause specifies that **all tuples** in the relation are to be deleted; the table then becomes an empty table.
  - The number of tuples deleted depends on the number of tuples in the relation that satisfy the WHERE-clause.

- Removes tuples from a relation
  - Includes a WHERE-clause to select the tuples to be deleted. The number of tuples deleted will vary.

U4A: DELETE FROM EMPLOYEE WHERE E.Ssn='123456789';  
 U4B: DELETE FROM EMPLOYEE WHERE E.Ssn='123456789';  
 U4C: DELETE FROM EMPLOYEE WHERE E.Dno=5;  
 U4D: DELETE FROM EMPLOYEE WHERE E.Dno=5;

# Update

- Used to modify attribute values of one or more selected tuples
- A WHERE-clause selects the tuples to be modified
- An additional SET-clause specifies the attributes to be modified and their new values
- Each command modifies tuples **in the same relation**
- Referential integrity specified as part of DDL specification is enforced

## Example:

Change the location and controlling department number of project number 10 to 'Bellaire' and 8, respectively

U5: UPDATE PROJECT  
 SET PLOCATION = 'Bellaire', DNUMBER = 8  
 WHERE PNUMBER = 10  
 Project ①

= } Ex.  
IN

## Example:

Give all employees in the 'Research' department a 10% raise in salary.

U6: UPDATE EMPLOYEE  
 SET SALARY = SALARY \* 1.1  
 WHERE DNO IN ( SELECT DNUMBER  
 FROM DEPARTMENT  
 WHERE DNAME = 'Research' )