Review: Nested Queries

```
SELECT   E.Fname, E.Lname
FROM     EMPLOYEE AS E
WHERE    E.Ssn IN (     SELECT    Essn
                        FROM      Dependent AS D
                        WHERE     E.Fname=D.Dependent_name
                                  AND E.Sex=D.Sex  );
```

- Note: a condition in the WHERE clause of the nested query references an attribute of a relation in the outer query. These two queries are called **CORRELATED**.
- With Correlated queries, the nested query is evaluated once for each tuple in the outer query.

Review: Nested Queries

- Correlated queries written with nested select-from-where blocks and using the "=" or IN comparison operators can usually be expressed as a single block query.

```
SELECT   E.Fname, E.Lname
FROM     EMPLOYEE AS E, DEPENDENT AS D
WHERE    E.Ssn=D.Essn  AND  E.Sex=D.Sex AND
         E.Fname=D.Dependent_name;
```

View (Virtual Tables) in SQL

- A view is a single table that is derived from other tables.
  - These other tables can be base tables or previously defined views.
- A view typically does not exist in physical form and is therefore considered to be a virtual table.
  - Base tables are physically stored in the database.

Views in SQL

- A view is a way of specifying a table that we need to reference frequently, even though it may not directly exist in the database.
- For example: If we are frequently working projects and employees, we will often have to JOIN three tables (EMPLOYEE, PROJECT, and WORKS_ON).
  - To save time, we could create a VIEW where they are already JOINED and only specified attributes are shown.

Creating a VIEW in SQL

- Command: CREATE VIEW
  - The view is assigned a table name or view name.
  - A list of attribute names and a query to specify the contents of the view is given.
- Example:

```
CREATE VIEW   WORKING
AS SELECT     Fname, Lname, Pname, Hours
FROM          EMPLOYEE, PROJECT, WORKS_ON
WHERE         Ssn=Essn AND Pno=Pnumber;
```

Creating a VIEW in SQL

- We can also rename attributes in the view. (By default, the view inherits attribute names.)
- Example:

```
CREATE VIEW  DEPT_INFO(Dept_name, No_of_emps, Total_Sal)
AS SELECT    Dname, COUNT(*), SUM(Salary)
FROM         DEPARTMENT, EMPLOYEE
WHERE        Dnumber=Dno
GROUP BY     Dname;
```

Queries on a VIEW

- We can specify queries on a VIEW after it is created.
- Same setup as a normal query
- Use VIEW name instead of table name
- Example:

modify employee → base table

```
SELECT    Fname, Lname
FROM      WORKING
WHERE     Pname='ProductX';
```

- Views simplify our queries, since the CREATE VIEW statement takes care of any JOIN conditions.

Removing an entire TABLE

- Removing an entire TABLE from a database
  - Its definition and all of its contents are removed
- DROP command

  DROP TABLE NAME;
- Impacting other tables in the database:
  - Referential constraints, foreign keys, …
- You may need to change the structure/setup of other tables in the database

- Removing ENTIRE DB: DROP DATABASE DBNAME;
- Removing a VIEW: DROP VIEW VIEWNAME;

ALTER TABLE Command

- Allows you to modify a table in the database
- You can:
  - Add a column definition to a table
  - Drop a column from a table
  - Change the default value for a column
  - Add or drop a primary key for a table
  - Add or drop a new foreign key for a table
  - Add or drop a uniqueness constraint for a table

ALTER TABLE Command

- Some examples:

  ALTER TABLE tname DROP COLUMN cname;

  ALTER TABLE tname ADD COLUMN cname;

  ALTER TABLE tname DROP PRIMARY KEY;

  ALTER TABLE tname DROP FOREIGN KEY cname;

- Sometimes the ALTER command be picky especially when you have referential constraints.
- Use them wisely.