

**Gebze Technical University**  
**Department of Computer Engineering**  
**CSE107 – Introduction to Computer Engineering**

**Lab Content:** Introduction to databases.

### DATABASE OPERATIONS

- How to create a database

**CREATE DATABASE** *databasename*;

- How to delete an existing database

**DROP DATABASE** *databasename*;

### TABLE OPERATIONS

- How to create table

<pre><b>CREATE TABLE</b> <i>table_name</i> (   <i>column1 datatype constraint</i>,   <i>column2 datatype constraint</i>,   .... );</pre> <pre><b>CREATE TABLE</b> Student (   StudentID int <b>NOT NULL PRIMARY KEY</b>,   FirstName varchar(255) <b>NOT NULL</b>,   LastName varchar(255) <b>NOT NULL</b>,   Email varchar(255) <b>UNIQUE</b>, );</pre> <p><b>Extra:</b> CONSTRAINT PK_Student PRIMARY KEY (StudentID, LastName)</p>	<p><b>Constraints</b></p> <ul style="list-style-type: none"> <li>• NOT NULL - Ensures that a column cannot have a NULL value</li> <li>• UNIQUE - Ensures that all values in a column are different</li> <li>• PRIMARY KEY - A combination of a NOT NULL and UNIQUE. Uniquely identifies each row in a table</li> <li>• FOREIGN KEY - Uniquely identifies a row/record in another table</li> <li>• CHECK - Ensures that all values in a column satisfies a specific condition</li> <li>• DEFAULT - Sets a default value for a column when no value is specified</li> <li>• INDEX - Used to create and retrieve data from the database very quickly</li> </ul>
<p><b>Data Types:</b> int, double, char(), varchar(), date(), image, binary, and so on.</p>	

- How to delete an existing table

**DROP TABLE** *table\_name*;

- How to add column to an existing table

**ALTER TABLE** *table\_name*  
**ADD** *column\_name datatype*;

- How to delete column from an existing table

**ALTER TABLE** *table\_name*  
**DROP COLUMN** *column\_name*;

- How to modify an existing column in an existing table

**ALTER TABLE** *table\_name*  
**ALTER COLUMN** *column\_name datatype*;

### RECORD OPERATIONS

- How to insert a record to an existing table

**INSERT INTO** *table\_name* (*column1, column2, column3, ...*)  
**VALUES** (*value1, value2, value3, ...*);

- How to update an existing record in an existing table

**UPDATE** *table\_name*  
**SET** *column1 = value1, column2 = value2, ...*  
**WHERE** *condition1 (AND/OR condition2...);*

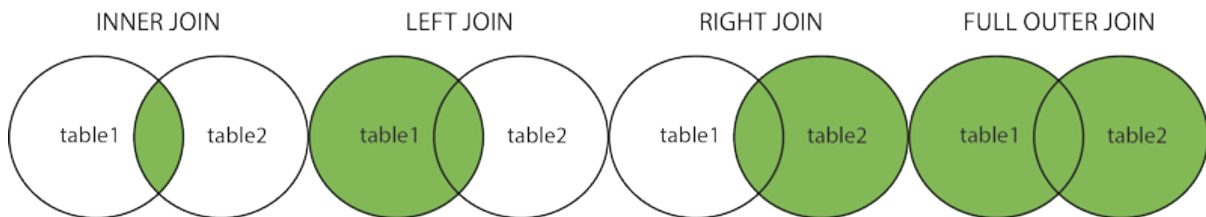
- How to delete an existing record in an existing table

**DELETE FROM** *table\_name*  
**WHERE** *condition1 (AND/OR condition2...);*

- How to retrieve specific records in an existing table

**SELECT** *column1, column2, ...*  
**FROM** *table\_name*  
**WHERE** *condition1 (AND/OR condition2...);*

- How to merge two or more tables and filter data
  - **(INNER) JOIN**: Returns records that have matching values in both tables
  - **LEFT (OUTER) JOIN**: Return all records from the left table, and the matched records from the right table
  - **RIGHT (OUTER) JOIN**: Return all records from the right table, and the matched records from the left table
  - **FULL (OUTER) JOIN**: Return all records when there is a match in either left or right table



#### Tasks:

Assistant		
AssistantID	Name	Surname
1	Mahmud Rasih	Celenlioglu
2	Ayşe	Serbetci Turan
3	Tugbagul	Altan Akin

Lecture	
AssistantID	LectureName
1	BIL107
2	BIL107
1	BIL495
2	BIL101
3	CSE000
4	CSE343

1. Create a database named as Bilmuh
2. Create Assistant and Lecture tables
3. Fill the tables with the data provided above
4. Query1: Select names and surnames in Assistant table
5. Query2: Select the records in Assistant table where surname includes 'an'
6. Query3: Delete the record in Lecture table whose LectureName is CSE000
7. Query4: Select the research assistants who are lecturer at BIL107