Discussion 11

Databases and Joins

Learning goals

1. Review on basic methods for databases

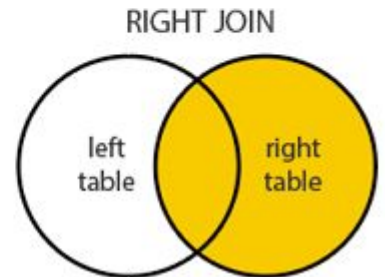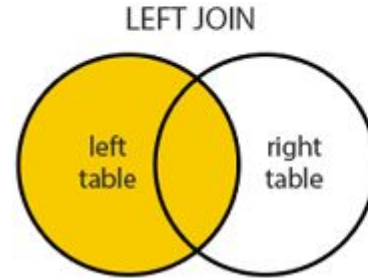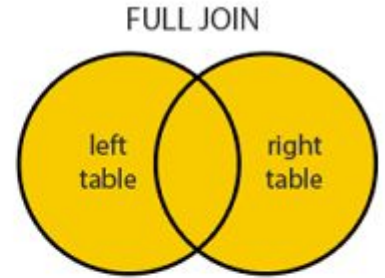   INSERT INTO, UPDATE, DROP, CREATE, SELECT, SET…
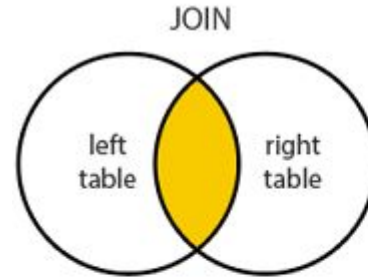
1. Building a database model:

    Integer reference pattern, different types of keys, building relationships

1. Work on different Joins

JOIN operation

1. Across different tables in the database
2. Leveraging the connections (e.g., foreign keys)
3. Different types of joins

JOIN operation

- (INNER) JOIN: Returns records that have matching values in both tables
- LEFT (OUTER) JOIN: Returns all records from the left table, and the matched records from the right table
- RIGHT (OUTER) JOIN: Returns all records from the right table, and the matched records from the left table
- FULL (OUTER) JOIN: Returns all records when there is a match in either left or right table
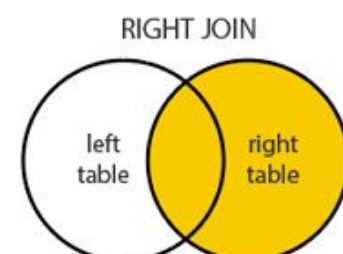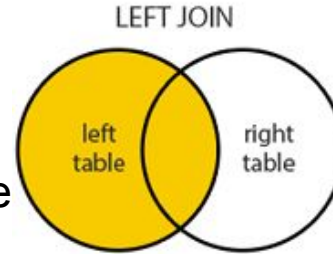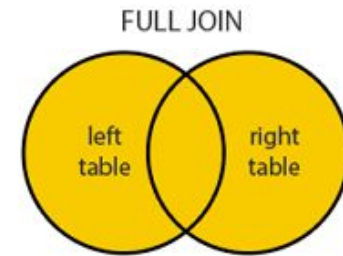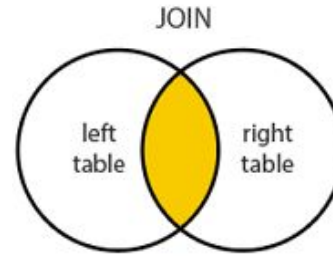
JOIN Operation

SELECT <What you want to see>

FROM <One table>

JOIN (one of the join methods) <Another Table>

ON <Attribute from one table> = <Attribute from the other table>
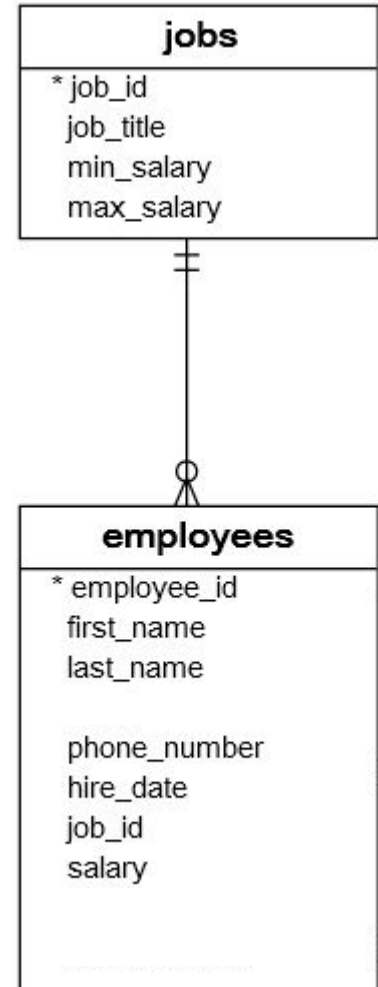
Time to practice!

In this task, you need to assist a start-up to set up their database (HR.db).

You also need to figure out some mistakes in the data provided to you (e.g., wrong salary).

jobs

* job_id
job_title
min_salary
max_salary

employees

* employee_id
first_name
last_name

phone_number
hire_date
job_id
salary

Working with employment database
(Ignore the sql_sequence table)

You are now hired by HR department at our university to deal with an employment database.

There are two tables in the database:

Job table (job_id, job_title, min_salary, max_salary) - provided to you in HR.db

Employee table (employee_id, first_name, last_name, job_id, hire_date, salary)

Task 1 - Create table

What is the primary key?

Datatype for each attribute?

Employee table (employee_id, first_name, last_name, job_id, hire_date, salary)

Task 1 - Add employee's information

A .json file including employee's information as a list of dicts has been provided to you. Please add their information into the Employee table.

Task 2 get job and hire_date information from two tables

Before coding, let's think about these questions:

What are the linked keys (columns) among the two tables?

Complete the following task:

Select hire_date from Employee and job_title from Jobs table and join them on job_id (INNER JOIN).

Return the job title at the earliest hire date

Expected return: President

Task 3 Identify problematic data

Return a list of tuples of employee's first name and last name, whose salary does not fall into the expected salary range (min_salary - max_salary).

Expected returned list:

[('Valli', 'Pataballa'), ('Diana', 'Lorentz'), ('Nancy', 'Greenberg'), ('Ismael', 'Sciarra')]