CW11-2-1: ERD

ERD1: University

Entities:

- Student: Each student has a unique student ID, name, and date of birth.
- Course: Each course has a unique course ID, title, and number of credits.
- Student Registration: Each student registration has a unique registration ID, along with the student ID, course ID, and registration date.
- Instructor: Each instructor has a unique instructor ID, name, and specialization.
- Department: Each department has a unique department ID and name.

Relations:

- Students can register for multiple courses, and each course can have multiple students registered. This means that students can sign up for multiple courses, and each course can have multiple students signing up.
- Each student registration is linked to one student and one course. This means that each student can have multiple registrations, and each course can have multiple registrations.
- Each course is associated with one instructor. This means that each course is taught by one instructor.
- Each department can offer multiple courses. This means that multiple courses can be associated with one department.
- Each instructor is associated with one department. This means that each instructor belongs to a specific department.

To design ERD you can use one of these websites:

https://app.diagrams.net/ https://lucid.app https://online.visual-paradigm.com/

ERD2: Photography

Entities:

- Photographer : first name, last name, nationality, photography style (e.g portrait, landscape, ...), year of birth, educational field
- Camera : brand, model, production year, number of shots
- Organization : name , location, year of establishment, field (art, news, photography, tourism, etc). Each department can be of the photography or news agencies or a site.
- Award : name, institute, price(in $), date
- Photo : title, location, capture date, file, subject

Relations:

- Each photographer has 1 camera.
- Each photographer works in one or more organizations and each organization has one or more photographers.
- Each photo is captured by one camera by one photographer for one organization.
- Each award is received by one photographer on a specified date for a specific photo.

To design ERD you can use one of these websites:

https://app.diagrams.net/ https://lucid.app https://online.visual-paradigm.com/

CW11-2-2: SQL

Create a new database on PostgreSQL and restore this database which you can download from the link dvdrental.

Based on the database and it's tables make queries:

- **Film table**

1. Show films that it's rental_duration is greater than 4
2. Show films that it's rental_duration is greater than 2 and less than 5
3. Sort the previous queries ascending and descending based on these fields: title, rental_duration, last_update
4. Show maximum, minimum, average of length of film
   - ✓ it is possible to use ROUND function

- **Address table**
  1. Show unique districts of address table.
     a) Limit number of rows
     b) Sort rows based on districts
  2. Count unique districts of address table.
  3. Count number of addresses for each district
     a) Sort rows based on districts
     b) Find top three, last three based on number of districts
  4. Show addresses that it’s district is California or Alberta
  5. Select address and district columns that it’s district is one of these districts: California, Alberta, Texas, Hamilton
  6. Show addresses that it’s address2 is empty
     (address2 is a field in address table)

- **Customer Table**
    1. Find customers that whose firstname starts with 'Jen'
    2. Find customers that whose firstname have 'er'
    3. Find customers that whose firstname ends with 'l'
    4. Find customers that whose firstname doesn’t start with 'Jen'

- **City and Country Tables**
    1. Show cities and countries beside each other using JOIN (INNER JOIN)
    2. Show countries and number of cities of them
        a) Sort based on number of cities descending.
        b) Show only 10 records.

- **Film and Film_Actor table**
    1. Show Each actor’s id, first name, last name and number of films that they played
        - You can use alias for each section if you think it's better that way.

- **ERD of DVD Rental Database:**
    1. Try to get diagram of your database using **pgadmin4.**
    2. Try to explain the relations between tables in this Entity Relation Diagram (ERD).

       Discuss about one to one, one to many, many to one and many to many relations.