QAP 2 – Databases

Exercise 2 – Designing Entities

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**Question 1&2: A student at a university/A faculty member at a university**

I chose to combine the representation of students and faculty members into a single set of tables in order to streamline data management and ensure consistency within the database schema. By sharing common attributes such as association with a university, we eliminate redundancy and simplify queries, updates, and other database operations. This approach not only reduces complexity but also provides flexibility for future modifications or expansions. Ultimately, by unifying the representation of students and faculty members, we achieve a more efficient and cohesive database design that aligns with our organizational needs.

1. **Location Table:**
   * **Table Name: Location**
   * **Attributes:**
     + **location\_id: An integer value serving as the primary key of the table, uniquely identifying each location. It is auto-generated using the SERIAL data type.**
     + **street\_address: A string representing the street address of the location.**
     + **unit\_number: A string representing the unit number of the location.**
     + **postal\_code: A string representing the postal code of the location.**

* **city: This attribute holds the name of the city or locality where the location is situated. It provides information about the city in which the address is located.**
* **province: This attribute stores the name of the province, state, or region associated with the location. It helps further specify the geographic region in which the address is situated.**

1. **University Table**:
   * Table Name: **University**
   * Attributes:
     + **university\_id**: An integer value that serves as the primary key of the table. It uniquely identifies each university.
     + **university\_name**: A string representing the name of the university.
     + **university\_head**: A string representing the head of the university.
     + **university\_email**: A string representing the email address of the university.
     + **location**: An integer value representing the location of the university. It is a foreign key referencing the **location\_id** column in the **Location** table.
2. **Student Table**:
   * Table Name: **Student**
   * Attributes:
     + **student\_id**: An integer value that serves as the primary key of the table. It uniquely identifies each student.
     + **student\_first\_name**: A string representing the first name of the student.
     + **student\_last\_name**: A string representing the last name of the student.
     + **student\_email**: A string representing the email address of the student.
     + **university\_id**: An integer value representing the university to which the student belongs. It is a foreign key referencing the **university\_id** column in the **University** table.
3. **Department Table**:
   * Table Name: **Department**
   * Attributes:
     + **department\_id**: An integer value that serves as the primary key of the table. It uniquely identifies each department.
     + **department\_name**: A string representing the name of the department.
     + **department\_head**: A string representing the head of the department.
     + **department\_email**: A string representing the email address of the department.
     + **university\_id**: An integer value representing the university to which the department belongs. It is a foreign key referencing the **university\_id** column in the **University** table.
4. **StudentDepartment Table**:
   * Table Name: **StudentDepartment**
   * Attributes:
     + **student\_id**: An integer value representing the student. It is a foreign key referencing the **student\_id** column in the **Student** table.
     + **department\_id**: An integer value representing the department. It is a foreign key referencing the **department\_id** column in the **Department** table.

**Question 3: A work of art that is displayed in a gallery or museum**

1. **Artist Table:**
   * **Table Name: Artist**
   * **Attributes:**
     + **artist\_id: An integer value serving as the primary key of the table, uniquely identifying each artist. It is auto-generated using the SERIAL data type.**
     + **artist\_first\_name: A string representing the first name of the artist.**
     + **artist\_last\_name: A string representing the last name of the artist.**
     + **artist\_email: A string representing the email address of the artist.**
     + **artist\_phone: A string representing the phone number of the artist.**
     + **location\_id: An integer value representing the location of the artist. It is a foreign key referencing the location\_id column in the Location table.**
2. **Gallery Table:**
   * **Table Name: Gallery**
   * **Attributes:**
     + **gallery\_id: An integer value serving as the primary key of the table, uniquely identifying each gallery. It is auto-generated using the SERIAL data type.**
     + **gallery\_name: A string representing the name of the gallery.**
     + **location\_id: An integer value representing the location of the gallery. It is a foreign key referencing the location\_id column in the Location table.**
3. **WorkofArt Table:**
   * **Table Name: WorkofArt**
   * **Attributes:**
     + **artwork\_id: An integer value serving as the primary key of the table, uniquely identifying each artwork. It is auto-generated using the SERIAL data type.**
     + **artwork\_title: A string representing the title of the artwork.**
     + **artwork\_medium: A string representing the medium of the artwork.**
     + **gallery\_id: An integer value representing the gallery where the artwork is displayed. It is a foreign key referencing the gallery\_id column in the Gallery table.**
     + **artist\_id: An integer value representing the artist who created the artwork. It is a foreign key referencing the artist\_id column in the Artist table.**
4. **Location Table:**
   * **Table Name: Location**
   * **Attributes:**
     + **location\_id: An integer value serving as the primary key of the table, uniquely identifying each location. It is auto-generated using the SERIAL data type.**
     + **street\_address: A string representing the street address of the location.**
     + **unit\_number: A string representing the unit number of the location.**
     + **postal\_code: A string representing the postal code of the location.**

* **city: This attribute holds the name of the city or locality where the location is situated. It provides information about the city in which the address is located.**
* **province: This attribute stores the name of the province, state, or region associated with the location. It helps further specify the geographic region in which the address is situated.**

**Question 4: An automobile that is registered with the Motor Vehicle Department  
1. Location Table:**

* + **Table Name: Location**
  + **Attributes:**
    - **location\_id: An integer value serving as the primary key of the table, uniquely identifying each location. It is auto-generated using the SERIAL data type.**
    - **street\_address: A string representing the street address of the location.**
    - **unit\_number: A string representing the unit number of the location.**
    - **postal\_code: A string representing the postal code of the location.**
* **city: This attribute holds the name of the city or locality where the location is situated. It provides information about the city in which the address is located.**
* **province: This attribute stores the name of the province, state, or region associated with the location. It helps further specify the geographic region in which the address is situated.**

1. **Owner Table:**
   * **Table Name: Owner**
   * **Attributes:**
     + **owner\_id: An integer value serving as the primary key of the table, uniquely identifying each owner. It is auto-generated using the SERIAL data type.**
     + **owner\_first\_name: A string representing the first name of the owner.**
     + **owner\_last\_name: A string representing the last name of the owner.**
     + **license\_no: A string representing the license number of the owner.**
     + **license\_exp: A string representing the expiration date of the owner's license.**
     + **location\_id: An integer value representing the location of the owner. It is a foreign key referencing the location\_id column in the Location table.**
2. **Automobile Table:**
   * **Table Name: Automobile**
   * **Attributes:**
     + **auto\_id: An integer value serving as the primary key of the table, uniquely identifying each automobile. It is auto-generated using the SERIAL data type.**
     + **license\_plate: A string representing the license plate of the automobile.**
     + **make: A string representing the make of the automobile.**
     + **model: A string representing the model of the automobile.**
     + **year: A string representing the year of the automobile.**
     + **owner\_id: An integer value representing the owner of the automobile. It is a foreign key referencing the owner\_id column in the Owner table.**
     + **branch\_id: An integer value representing the motor vehicle department branch associated with the automobile. It is a foreign key referencing the branch\_id column in the MotorVehicleDepartment table.**
3. **OwnerAutomobile Table:**
   * **Table Name: OwnerAutomobile**
   * **Attributes:**
     + **owner\_id: An integer value representing the owner of the automobile. It is a foreign key referencing the owner\_id column in the Owner table.**
     + **auto\_id: An integer value representing the automobile. It is a foreign key referencing the auto\_id column in the Automobile table.**
     + **Primary Key: Composite primary key consisting of (owner\_id, auto\_id).**
4. **MotorVehicleDepartment Table:**
   * **Table Name: MotorVehicleDepartment**
   * **Attributes:**
     + **branch\_id: An integer value serving as the primary key of the table, uniquely identifying each motor vehicle department branch. It is auto-generated using the SERIAL data type.**
     + **location\_id: An integer value representing the location of the motor vehicle department branch. It is a foreign key referencing the location\_id column in the Location table.**
     + **phone\_number: A string representing the phone number of the motor vehicle department branch.**

**Question 5: A pizza that is on the menu at a restaurant**

1. **Location Table:**
   * **Table Name: Location**
   * **Attributes:**
     + **location\_id: An integer value serving as the primary key of the table, uniquely identifying each location. It is auto-generated using the SERIAL data type.**
     + **street\_address: A string representing the street address of the location.**
     + **unit\_number: A string representing the unit number of the location.**
     + **postal\_code: A string representing the postal code of the location.**

* **city: This attribute holds the name of the city or locality where the location is situated. It provides information about the city in which the address is located.**
* **province: This attribute stores the name of the province, state, or region associated with the location. It helps further specify the geographic region in which the address is situated.**

1. **Toppings Table:**
   * **Table Name: Toppings**
   * **Attributes:**
     + **topping\_id: An integer value serving as the primary key of the table, uniquely identifying each topping. It is auto-generated using the SERIAL data type.**
     + **topping\_name: A string representing the name of the topping.**
2. **Restaurant Table:**
   * **Table Name: Restaurant**
   * **Attributes:**
     + **restaurant\_id: An integer value serving as the primary key of the table, uniquely identifying each restaurant. It is auto-generated using the SERIAL data type.**
     + **phone\_no: A string representing the phone number of the restaurant.**
3. **Pizza Table:**
   * **Table Name: Pizza**
   * **Attributes:**
     + **pizza\_id: An integer value serving as the primary key of the table, uniquely identifying each pizza. It is auto-generated using the SERIAL data type.**
     + **pizza\_name: A string representing the name of the pizza.**
     + **pizza\_description: A string representing the description of the pizza.**
     + **pizza\_type: A string representing the type of the pizza.**
     + **restaurant\_id: An integer value representing the restaurant that serves the pizza. It is a foreign key referencing the restaurant\_id column in the Restaurant table.**
4. **PizzaToppings Table:**
   * **Table Name: PizzaToppings**
   * **Attributes:**
     + **pizza\_id: An integer value representing the pizza. It is a foreign key referencing the pizza\_id column in the Pizza table.**
     + **toppings\_id: An integer value representing the topping. It is a foreign key referencing the topping\_id column in the Toppings table.**
     + **Primary Key: Composite primary key consisting of (pizza\_id, toppings\_id) to ensure uniqueness and to establish the many-to-many relationship between pizzas and toppings.**

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**Question 6: Household furniture**

1. **Location Table:**
   * **Table Name: Location**
   * **Attributes:**
     + **location\_id: An integer value serving as the primary key of the table, uniquely identifying each location. It is auto-generated using the SERIAL data type.**
     + **street\_address: A string representing the street address of the location.**
     + **unit\_number: A string representing the unit number of the location.**
     + **postal\_code: A string representing the postal code of the location.**

* **city: This attribute holds the name of the city or locality where the location is situated. It provides information about the city in which the address is located.**
* **province: This attribute stores the name of the province, state, or region associated with the location. It helps further specify the geographic region in which the address is situated.**

1. **FurnitureType Table:**
   * **Table Name: FurnitureType**
   * **Attributes:**
     + **type\_id: An integer value serving as the primary key of the table, uniquely identifying each furniture type. It is auto-generated using the SERIAL data type.**
     + **type\_description: A string representing the description of the furniture type.**
     + **province: A string representing the province associated with the furniture type.**
     + **postal\_code: A string representing the postal code associated with the furniture type.**
2. **HouseHoldFurniture Table:**
   * **Table Name: HouseHoldFurniture**
   * **Attributes:**
     + **furniture\_id: An integer value serving as the primary key of the table, uniquely identifying each household furniture item. It is auto-generated using the SERIAL data type.**
     + **furniture\_name: A string representing the name of the household furniture.**
     + **type\_id: An integer value representing the type of furniture. It is a foreign key referencing the type\_id column in the FurnitureType table.**
     + **location\_id: An integer value representing the location of the furniture. It is a foreign key referencing the location\_id column in the Location table.**
     + **furniture\_description: A string representing the description of the household furniture.**
3. **LocationFurniture Table:**
   * **Table Name: LocationFurniture**
   * **Attributes:**
     + **location\_id: An integer value representing the location of the furniture. It is a foreign key referencing the location\_id column in the Location table.**
     + **furniture\_id: An integer value representing the household furniture item. It is a foreign key referencing the furniture\_id column in the HouseHoldFurniture table.**
     + **Primary Key: Composite primary key consisting of (location\_id, furniture\_id) to ensure uniqueness and to establish the many-to-many relationship between locations and furniture.**

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