



**Kuwait University**

**College of Engineering and Petroleum**

**Computer Engineering Department**

---

**CpE-341: Database Management Systems**

**Semester: Summer 2020/2021**

**Section No. 01A**

**Student Name:** Narjes Alfadhli

**Student ID:** 2161113654

**Instructor Name:** Dr. Khaled Hadi

What is the difference between a database schema and a database state?

- Database schema: is the description of a database, Includes descriptions of the database structure, data types, and the constraints on the database.
- Database state: The actual data stored in a database at a particular moment in time. This includes the collection of all the data in the database.

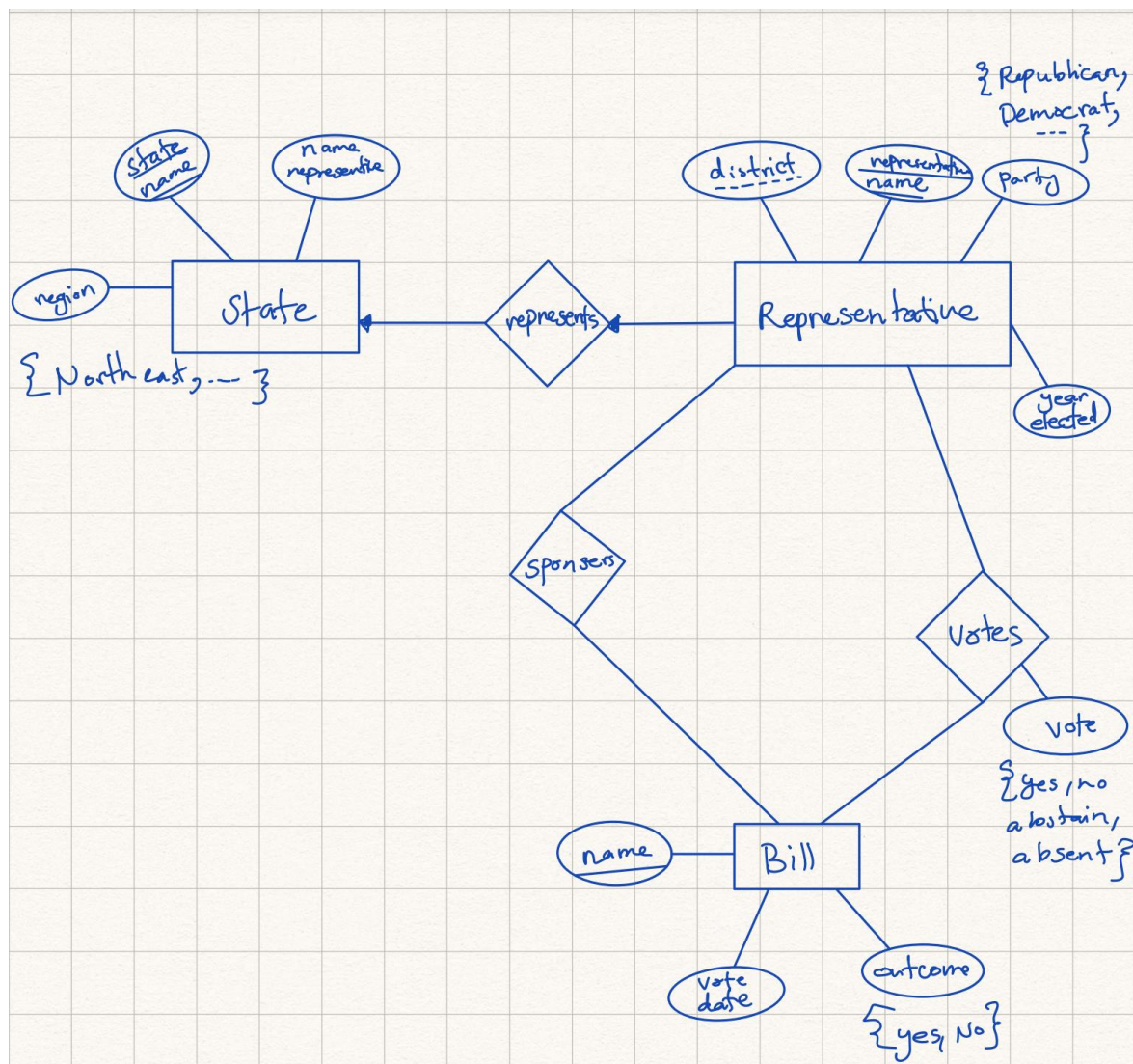
What is an entity type? What is an entity set? Explain the differences among an entity, an entity type, and an entity set.

- Entity type: Entities with the same basic attributes are grouped or typed into an entity type.
- Entity set: Each entity type will have a collection of entities stored in the database called the entity set or sometimes entity collection.

Under what conditions can an attribute of a binary relationship type be migrated to become an attribute of one of the participating entity types?

- An attribute of a binary relationship type can be migrated to become an attribute of one the participating entity type when the relationship type is 1:1 or 1:N. This is because each entity participates in at most one relationship instance.

Design an ER schema for keeping track of information about votes taken in the U.S. House of Representatives during the current two-year congressional session. The database needs to keep track of each U.S. STATE's Name (e.g., 'Texas', 'New York', 'California') and include the Region of the state (whose domain is {'Northeast', 'Midwest', 'Southeast', 'Southwest', 'West'}). Each CONGRESS\_PERSON in the House of Representatives is described by his or her Name, plus the District represented, the Start\_date when the congressperson was first elected, and the political Party to which he or she belongs (whose domain is {'Republican', 'Democrat', 'Independent', 'Other'}). The database keeps track of each BILL (i.e., proposed law), including the Bill\_name, the Date\_of\_vote on the bill, whether the bill Passed\_or\_failed (whose domain is {'Yes', 'No'}), and the Sponsor (the congressperson(s) who sponsored—that is, proposed—the bill). The data base also keeps track of how each congressperson voted on each bill (domain of Vote attribute is {'Yes', 'No', 'Abstain', 'Absent'}). Draw an ER schema diagram for this application. State clearly any assumptions you make.



Consider the below ER diagram. Assume that an employee may work in up to two departments or may not be assigned to any department. Assume that each department must have one and may have up to three phone numbers. Supply (min, max) constraints on this diagram. State clearly any additional assumptions you make. Under what conditions would the relationship HAS\_PHONE be redundant in this example?

