

**Question 1:**

Relational databases are based on which mathematical theory or field?

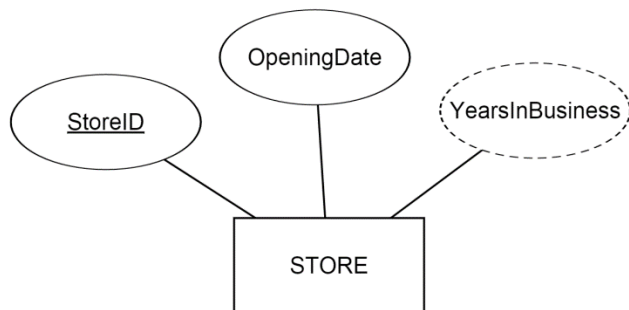
- A. **Set theory**
- B. Information theory
- C. Matrix algebra
- D. Probability theory

**Correct Answer: A**

**Correct Feedback:** It is useful to review the principles of set theory that underlie the mechanisms relational databases use to combine tables whenever you have trouble combining tables in your SQL queries.

**Incorrect Feedback:** This is an important piece of information to know, so please review the materials from the beginning of the course until you feel confident in your answer.

**Question 2:**



YearsInBusiness in the ER diagram above is a:

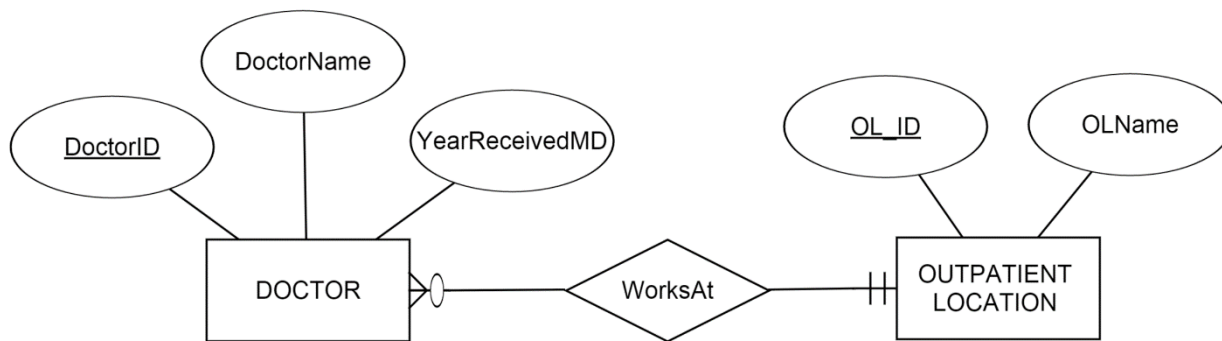
- A. Unique attribute
- B. Candidate key
- C. **Derived attribute**
- D. Composite attribute

**Correct Answer: C**

**Correct Feedback:** Derived attributes are depicted by dashed oval lines. They will not be permanently stored in a database because they can be derived from other information that will be stored (in this case, OpeningDate).

**Incorrect Feedback:** No feedback provided.

**Question 3:**



Which of the following is true about cardinality constraints on the relationship between Doctor and Outpatient Location depicted in this ER diagram?

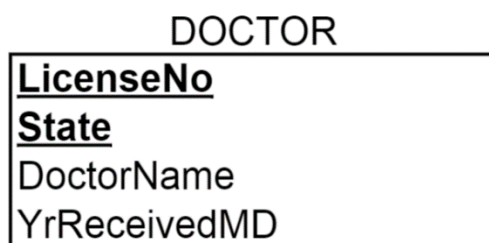
- A. An outpatient location must have 1 doctor working at it, but can have no more than 1 doctor working at it.
- B. An outpatient location must have at least 1 doctor working at it, but can have many doctors working at it.
- C. A doctor is required to work at one outpatient location, but can work at no more than 1 outpatient location.**
- D. A doctor can work at many outpatient locations, but does not have to work at any.

**Correct Answer: C**

**Correct Feedback:** No feedback provided.

**Incorrect Feedback:** When interpreting ER diagrams, remember to start from one entity, follow the connecting line, and then interpret the symbols closest to the other entity.

**Question 4:**



Which columns would be necessary for identifying unique doctors in the doctor table of the database built from the relational schema excerpt above?

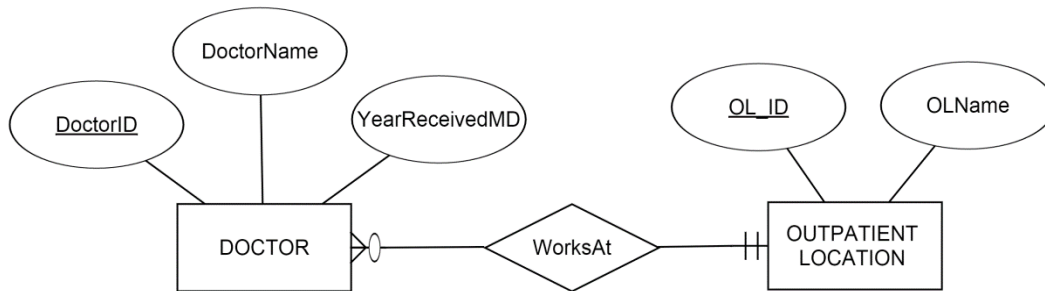
- A. LicenseNo
- B. State
- C. You would have to use both LicenseNo and State**
- D. You could use either LicenseNo or State

**Correct Answer: C**

**Correct Feedback:** LicenseNo and State represent a composite primary key.

**Incorrect Feedback:** Please review the video about Relational Schemas.

**Question 5:**



In the ER diagram above, Doctor\_ID and OL\_ID are:

- A. Unique attributes or keys
- B. Primary keys
- C. Foreign keys
- D. Composite attributes or keys

**Correct Answer: A**

**Correct Feedback:** Attributes in ER diagrams can be unique, but they do not get assigned to be primary or foreign keys until the relational schema stage of modeling a database.

**Incorrect Feedback:** No feedback provided.

**Question 6:**

Which type of information is most likely to be stored in a relational database as opposed to another type of database?

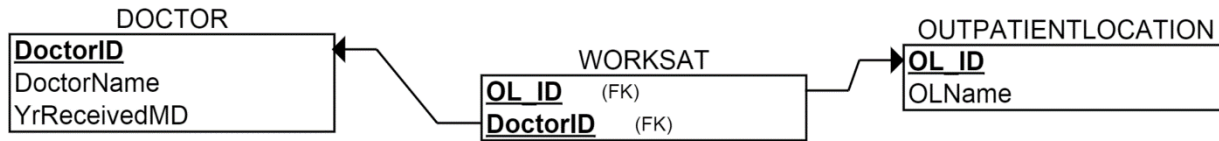
- A. texts
- B. tweets
- C. pictures
- D. metadata (file name, file location, when the file was created, etc.) about pictures

**Correct Answer: D**

**Correct Feedback:** File metadata is easily stored in tables, so it would be handled well by relational databases. Texts, tweets, and pictures, themselves, are not stored easily in tables, so they would be much more challenging (or impossible) to manage with a relational database.

**Incorrect Feedback:** Remember what kind of information relational databases are made to store.

**Question 7:**



What can you infer about the data being collected based on the relational schema above?

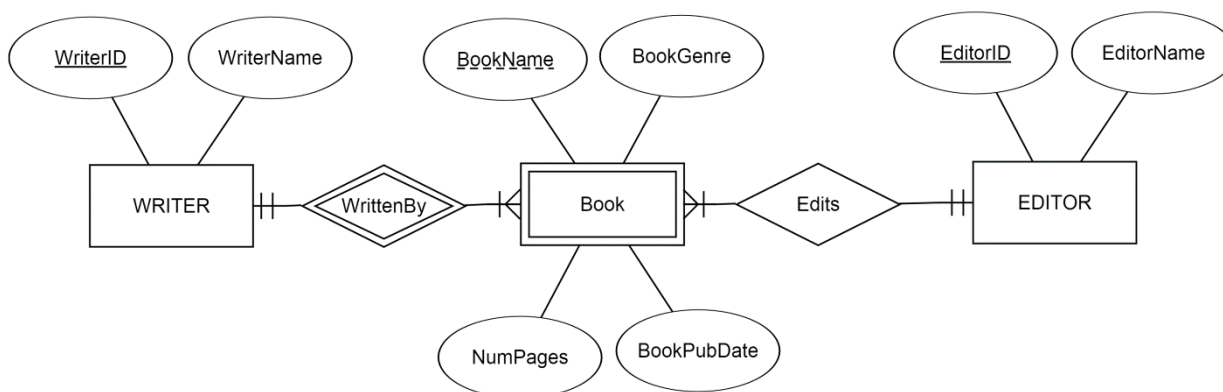
- A. A doctor can work at many outpatient locations, and an outpatient location can have many doctors working at it
- B. The data collected in OL\_ID of the OutpatientLocation table, on its own, is sufficient to determine at which outpatient location(s) each doctor works
- C. The data collected in OL\_ID of the WorksAt table, on its own, is sufficient to determine at which outpatient location(s) each doctor works
- D. A doctor can only work at one outpatient location, but an outpatient location can have many doctors working at it

**Correct Answer: A**

**Correct Feedback:** The WorksAt table is likely a linking table that allows a many-to-many relationship between doctors and outpatient locations to be tracked. As I said in the video about relational schemas, whenever you see a mapping table like this in a database, it's a clue that the columns in the tables it links can have multiple instances of each other.

**Incorrect Feedback:** Please review the video about relational schemas. You may also find it useful to complete the optional relational schema exercises included with the course materials. Pay attention to references about "mapping tables" or "linking tables."

**Question 8:**



Based on the diagram above, which attributes can be used to identify unique books?

- A. BookName
- B. BookName and EditorID
- C. BookName and BookPubDate
- D. BookName and WriterID

**Correct Answer: D**

## Week 1 Graded Assessment

**Correct Feedback:** The fact that “WrittenBy” has a double diamond indicates that its unique attribute, WriterID, can be combined with BookName to identify unique books.

**Incorrect Feedback:** Pay attention to the types of relationships between Book and the other entities.

### Question 9:

Which of the following statements are true about foreign keys? Check all that apply.

- A. Have the same name as primary keys in another table
- B. Refer to columns with unique values for every row in other relations/tables**
- C. Are columns with unique values for every row in the relation/table they are in
- D. Allow information in different tables to be linked to each other**

**Correct Answer:** B, D

**Correct Feedback:** Foreign keys do not have to have the same name as the primary keys they connect to, and do not have to have unique values in every one of their rows.

**Incorrect Feedback:** Please review the video about Relational Schemas.

### Question 10:



Given the relational schema presented above, from how many tables would you need information in order to determine at which outpatient location(s) each doctor works?

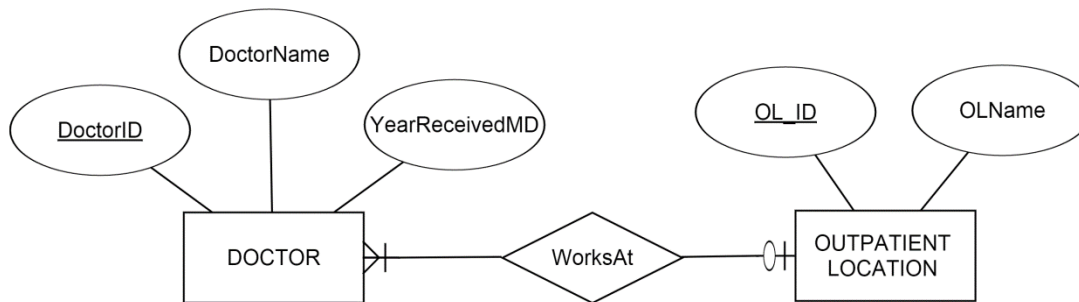
- A. 1
- B. 2
- C. 3**
- D. 2 or 3, depending on the strategy you use to combine the information

**Correct Answer:** C

**Correct Feedback:** In order to connect DoctorName with OLName (Outpatient Location Name), you need to connect DoctorID and OL\_ID via the WorksAt table.

**Incorrect Feedback:** Please review the video about Relational Schemas.

**Question 11:**



**Which of the following is true about cardinality constraints on the relationship between Doctor and Outpatient Location depicted in this ER diagram?**

- A. Each outpatient location must have 1 doctor working at it, but can have no more than 1 doctor working at it.
- B. An outpatient location must have at least 1 doctor working at it, but can have many doctors working at it.**
- C. A doctor is required to work at one outpatient location, but can work at no more than 1 outpatient location.
- D. A doctor can work at many outpatient locations, but does not have to work at any.

**Correct Answer: B**

**Correct Feedback:** No feedback provided

**Incorrect Feedback:** When interpreting ER diagrams, remember to start from one entity, follow the connecting line, and then interpret the symbols closest to the other entity.

**Question 12:**

**Which of the following statements are true about the technical terms for the concepts represented by relational schemas? Check all that apply.**

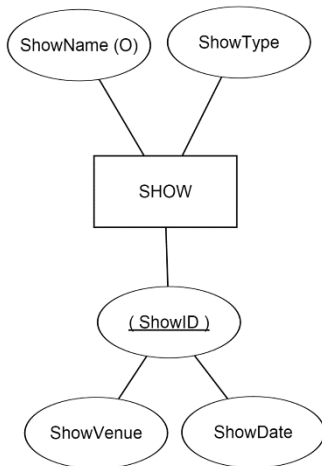
- A. The technical term for items in a relational schema that become tables in a real database is “entities”
- B. The technical term for items in a relational schema that become columns in a real database is “fields”
- C. The technical term for items in a relational schema that become columns in a real database is “attributes”**
- D. The technical term for items in a relational schema that become rows in a real database is “tuples”**

**Correct Answers: C,D**

**Correct Feedback:** “Entities” are the formal name for table-like concepts in ER diagrams, not relational schemas. Columns in relational schemas can be called “fields” in common or informal language, but not in formal technical language. This information is useful to know if you have to talk to database architects.

**Incorrect Feedback:** Make sure you differentiate between the terminology used for ER diagrams and the terminology used for relational schemas.

**Question 13:**



Based on the diagram above, which of the following is true?

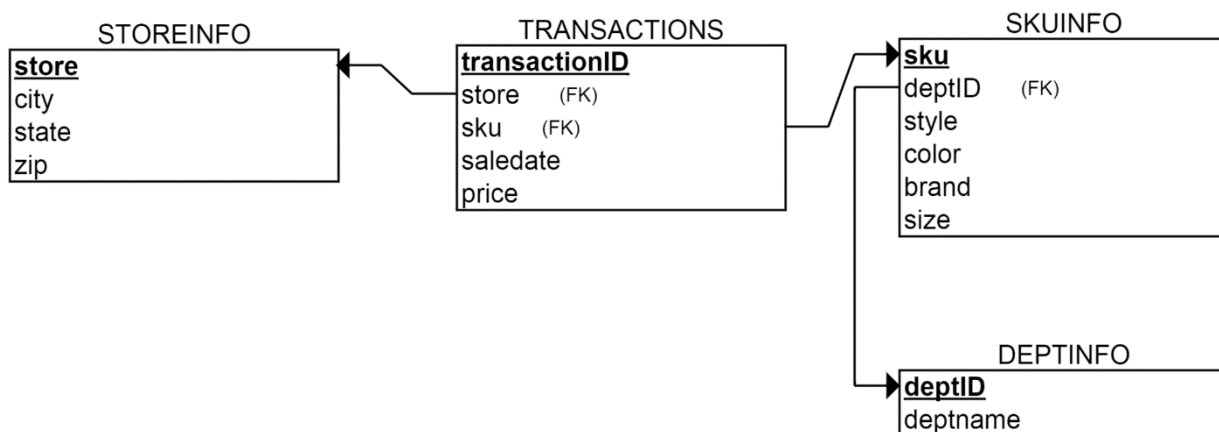
- A. ShowType and ShowName are needed together to provide a unique identifier for each show
- B. ShowType and ShowVenue are needed together to provide a unique identifier for each show
- C. ShowDate and ShowVenue are needed together to provide a unique identifier for each show**
- D. ShowID and ShowVenue are needed together to provide a unique identifier for each show

**Correct Answer: C**

**Correct Feedback:** The fact that “ShowID” is underlined and in parentheses indicates that it can be a unique identifier when the attributes attached to it, ShowVenue and ShowDate, are combined.

**Incorrect Feedback:** Try again! Review the concept of composite attributes.

**Question 14:**



If this relational schema represented a database that was already implemented, what columns would you use to combine the information in the transactions table with the information in the departinfo table?

- A. “store” to connect the transactions table to the storeinfo table, and then “deptname” to connect the storeinfo table to the departinfo table

Week 1 Graded Assessment

- B. "sku" to connect the transactions table to the skuinfo table, and then "departID" to connect the skuinfo table to the departinfo table
- C. "sku" to connect the transactions table to the skuinfo table, and then "deptname" to connect the skuinfo table to the departinfo table
- D. "deptname" to connect the transactions table to the departinfo table

**Correct Answer: B**

**Correct Feedback:** No feedback provided

**Incorrect Feedback:** Look closely at the arrows and columns designated as foreign keys.

**Question 15:**

**For relational databases to work most efficiently, which of the following requirements of set theory should be followed? Check all that apply.**

- A. There should be no NULL values allowed in the database
- B. Single tables should represent the smallest logical parts of a data set
- C. Each column in a table should represent a unique category of information
- D. Each row in a table should represent a unique instance of the information in that table

**Correct Answers: B, C, D**

**Correct Feedback:** Remember, though, that although these factors make relational databases function most smoothly and efficiently, it is possible for databases to have duplicate rows, conceptually similar columns, and tables that do not represent the smallest logical parts of a data set.

**Incorrect Feedback:** Please review the video "Problems with Having a Lot of Data Used by a Lot of People."