Question & Response Results

* Question: Create six multiple choice question and answer of the question with the Access Control concept

Response: LEVEL: Remember  
Question: Define Content-based Access Control A) A method that allows access to data based on specific user behaviorsB) A system that grants or denies access based on the content of an objectC) A method that restricts access to a database based on the user's locationD) A system that controls access based on the user's job titleAnswer: B) A system that grants or denies access based on the content of an object  
  
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LEVEL: Understand  
Question: Explain how Content-based Access Control takes the protection object content into account (Page Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, Page: 1155)  
A) By using specific keywords to filter access to the object  
B) By granting access to all users regardless of the object content  
C) By denying access to all users regardless of the object content  
D) By analyzing the structure of the object to determine access rights  
Answer: A) By using specific keywords to filter access to the object  
  
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LEVEL: Apply  
Question: Solve a scenario where a user wants to access a confidential document, but their job role does not grant them direct access. How can Content-based Access Control be used to grant this user access (Page Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, Page: 1155)  
A) By adding specific keywords related to the document to the user's profile  
B) By denying the user access regardless of their job role  
C) By granting the user direct access based on their job role  
D) By analyzing the structure of the document to determine if the user should have access  
Answer: A) By adding specific keywords related to the document to the user's profile  
  
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LEVEL: Analyze  
Question: Compare Content-based Access Control and Role-Based Access Control (Page Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, Page: 1152)  
A) They are the same methods used for access control in databases  
B) Content-based Access Control is more flexible than Role-Based Access Control  
C) Role-Based Access Control is more flexible than Content-based Access Control  
D) Both methods can be used simultaneously to improve security  
Answer: C) Role-Based Access Control is more flexible than Content-based Access Control  
  
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LEVEL: Evaluate  
Question: Justify why it is important for a system to support both Content-based Access Control and Role-Based Access Control (Page Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, Page: 1152)  
A) To improve security by providing multiple layers of protection  
B) To reduce the complexity of access control policies  
C) To make it easier to manage user identities and permissions  
D) To allow for more efficient data retrieval  
Answer: A) To improve security by providing multiple layers of protection  
  
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LEVEL: Create  
Question: Generate an example scenario where Content-based Access Control would be necessary (Page Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, Page: 1155)  
A) A user wanting to access a document containing specific financial information that only users with a certain clearance level should see  
B) A user wanting to access a document containing sensitive company strategies that only executives should see  
C) A user wanting to access a document containing personal customer information that only authorized personnel should see  
D) A user wanting to access a document containing public information that is accessible to everyone  
Answer: C) A user wanting to access a document containing personal customer information that only authorized personnel should see

* Question: Create six multiple choice question and answer of the question with the ACID Properties concept

Response: Level: Remember (1)  
Question: What does A in ACID properties stand for?  
A) Atomicity  
B) Availability  
C) Accessibility  
D) Accountability  
Answer: A) Atomicity  
LEVEL: 1, PAGE SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf (page 770)  
  
Level: Remember (1)  
Question: What does C in ACID properties stand for?  
A) Consistency  
B) Commitment  
C) Containment  
D) Confidentiality  
Answer: A) Consistency  
LEVEL: 1, PAGE SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf (page 770)  
  
Level: Understand (2)  
Question: Explain what is meant by Atomicity in the context of ACID properties?  
A) A transaction should be broken down into smaller sub-transactions that can be independently processed  
B) A transaction should either be performed in its entirety or not performed at all  
C) A transaction can be interrupted and rolled back if a failure occurs during execution  
D) All changes made by a transaction must be recorded to maintain a record of the database's history  
Answer: B) A transaction should either be performed in its entirety or not performed at all  
LEVEL: 2, PAGE SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf (page 770)  
  
Level: Understand (2)  
Question: Explain what is meant by Consistency in the context of ACID properties?  
A) A transaction should not affect the integrity or validity of the database  
B) A transaction can be performed multiple times without affecting other transactions  
C) A transaction must be completed quickly to prevent delays in system performance  
D) All changes made by a transaction should be visible to other users immediately  
Answer: A) A transaction should not affect the integrity or validity of the database  
LEVEL: 2, PAGE SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf (page 770)  
  
Level: Analyze (4)  
Question: Compare and contrast Atomicity and Consistency in the context of ACID properties?  
A) They are both mechanisms for ensuring the integrity of the database, but atomicity ensures that a transaction is completed as a single unit while consistency preserves the validity of the database state  
B) Atomicity is responsible for handling exceptions during a transaction while consistency is responsible for ensuring that transactions do not interfere with each other  
C) Atomicity refers to the ability of a system to recover from errors or failures while consistency ensures that the database remains in a consistent state after a transaction has been executed  
D) Atomicity and Consistency are two different types of databases, with atomicity being a type of relational database and consistency being a type of distributed database  
Answer: A) They are both mechanisms for ensuring the integrity of the database, but atomicity ensures that a transaction is completed as a single unit while consistency preserves the validity of the database state  
LEVEL: 4, PAGE SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf (page 770)  
  
Level: Create (6)  
Question: Develop an example scenario that demonstrates why Atomicity is important in a database system?  
A) A bank customer initiates two separate transactions, one to transfer funds from their account to another and the second to withdraw cash. However, due to an unexpected error, only the withdrawal transaction is completed, leaving the customer's account overdrawn.  
B) A hospital patient's medical records are being updated with a new medication prescription and their insurance information. The system crashes before both updates have been saved, leaving the patient without the necessary medication or insurance coverage.  
C) A retail store is updating its inventory database to reflect the sale of several items, but only some of the updates are completed due to an error, resulting in incorrect inventory levels.  
D) A university student is registering for multiple courses online, but the system crashes before all of the registrations have been processed, leaving the student enrolled in some courses but not others.  
Answer: A) A bank customer initiates two separate transactions, one to transfer funds from their account to another and the second to withdraw cash. However, due to an unexpected error, only the withdrawal transaction is completed, leaving the customer's account overdrawn.  
LEVEL: 6, PAGE SOURCE: N/A (created scenario)

* Question: Create six multiple choice question and answer of the question with the ALTER TABLE command

Response: Level: Remember  
Question: Define the purpose of the ALTER TABLE command in SQL.  
A) To delete a column from a table  
B) To add a new attribute to an existing relation (table)  
C) To modify the structure or schema of an existing table  
D) To delete all tuples (rows) in a table  
Answer: C) To modify the structure or schema of an existing table  
  
Level: Understand  
Question: Explain the use of ALTER TABLE command with the addition of a new column.  
A) It allows adding a new attribute to an existing relation (table)  
B) It is used to delete all tuples (rows) in a table  
C) It modifies the structure or schema of an existing table by adding a default value for an existing attribute  
D) It is used to update the existing attributes in a specific table  
Answer: A) It allows adding a new attribute to an existing relation (table)  
  
Level: Apply  
Question: Solve the following problem using ALTER TABLE command: How can we add a new column 'Job' to the EMPLOYEE relation?  
A) We can use the INSERT command to insert a new tuple with the Job attribute  
B) We can modify the structure or schema of the existing EMPLOYEE table by adding a default value for an existing attribute  
C) We can drop and re-create the entire EMPLOYEE table with the addition of the 'Job' column  
D) Use ALTER TABLE command to add a new column 'Job' to the EMPLOYEE relation  
Answer: D) Use ALTER TABLE command to add a new column 'Job' to the EMPLOYEE relation  
  
Level: Analyze  
Question: Compare and justify the use of CHECK clause and CREATE ASSERTION in SQL.  
A) Both CHECK clause and CREATE ASSERTION are used for enforcing constraints on attributes, domains, or tuples. However, the CHECK clauses on individual attributes, domains, and tuples are checked only when tuples are inserted or updated in a specific table, while CREATE ASSERTION should be used in cases where it is not possible to use CHECK on attributes, domains, or tuples  
B) Both CHECK clause and CREATE ASSERTION are used for enforcing constraints on individual attributes, domains, or tuples. However, the CHECK clauses are checked only when tuples are inserted or updated in a specific table, while CREATE ASSERTION should be used in cases where it is not possible to use CHECK on individual attributes, domains, or tuples  
C) Both CHECK clause and CREATE ASSERTION are used for enforcing constraints on attributes, domains, or tuples. However, the CHECK clauses are checked only when tuples are inserted or updated in a specific table, while CREATE ASSERTION should be used in cases where it is possible to use CHECK on individual attributes, domains, or tuples  
D) Both CHECK clause and CREATE ASSERTION are used for enforcing constraints on attributes, domains, or tuples. However, the CHECK clauses are checked only when tuples are inserted or updated in a specific table, while CREATE ASSERTION should be used in cases where it is not necessary to use CHECK on individual attributes, domains, or tuples  
Answer: A) Both CHECK clause and CREATE ASSERTION are used for enforcing constraints on attributes, domains, or tuples. However, the CHECK clauses on individual attributes, domains, and tuples are checked only when tuples are inserted or updated in a specific table, while CREATE ASSERTION should be used in cases where it is not possible to use CHECK on attributes, domains, or tuples  
  
Level: Evaluate  
Question: Determine the correct command to drop an attribute 'Address' from the EMPLOYEE base table with CASCADE drop behavior.  
A) Use DROP FROM command to remove the 'Address' attribute from the EMPLOYEE table  
B) Use ALTER TABLE command to remove the 'Address' attribute from the EMPLOYEE table and choose RESTRICT for drop behavior  
C) Use ALTER TABLE command to remove the 'Address' attribute from the EMPLOYEE table and choose CASCADE for drop behavior  
D) Use DROP FROM command to remove the 'Address' attribute from the EMPLOYEE table with CASCADE drop behavior  
Answer: C) Use ALTER TABLE command to remove the 'Address' attribute from the EMPLOYEE table and choose CASCADE for drop behavior  
  
Level: Create  
Question: Generate a SQL statement to add a new column 'Job' to an existing relation (table) named 'EMPLOYEE' with a default value of 'Clerk'.  
A) INSERT INTO EMPLOYEE (Job) VALUES ('Clerk');  
B) ALTER TABLE EMPLOYEE ADD COLUMN Job DEFAULT 'Clerk';  
C) UPDATE EMPLOYEE SET Job = 'Clerk';  
D) CREATE NEW COLUMN Job AS 'Clerk' IN EMPLOYEE;  
Answer: B) ALTER TABLE EMPLOYEE ADD COLUMN Job DEFAULT 'Clerk';

* Question: Create six multiple choice question and answer of the question with the Attribute concept

Response: 1. LEVEL: Remember  
 Question: Define an attribute in the context of databases.  
 A) A binary relationship represented by a reference in only one direction  
 B) The total number of records stored in a database  
 C) A column or field used to store data about an entity or concept  
 D) The minimum and maximum values allowed for a multivalued attribute  
 Answer: C) A column or field used to store data about an entity or concept  
  
2. LEVEL: Understand  
 Question: Explain what is meant by missing attributes in the context of databases.  
 A) Attributes that do not exist in the database schema  
 B) Attributes with no values assigned to them for a specific record  
 C) Attributes that are not part of the key attributes of an entity  
 D) Attributes that have lower and upper bounds but exceed them in a record  
 Answer: B) Attributes with no values assigned to them for a specific record  
  
3. LEVEL: Apply  
 Question: Solve this problem: Determine if the Home\_phone attribute of a person is a composite or multivalued attribute based on the context given.  
 A) Composite, as it can have multiple phone numbers associated with one person  
 B) Multivalued, as different people may have different numbers of home phones  
 C) Neither, as home phone number should be unique for each person  
 D) It cannot be determined without additional context  
 Answer: A) Composite, as it can have multiple phone numbers associated with one person  
  
4. LEVEL: Analyze  
 Question: Compare complex attributes and simple attributes in the context of databases.  
 A) Simple attributes have lower and upper bounds, while complex attributes do not  
 B) Complex attributes are nested arbitrarily, while simple attributes are not  
 C) Complex attributes can represent multiple values for an entity, while simple attributes cannot  
 D) Simple attributes are always composite, while complex attributes are never composite  
 Answer: C) Complex attributes can represent multiple values for an entity, while simple attributes cannot  
  
5. LEVEL: Evaluate  
 Question: Justify whether a stored attribute should be determined from another attribute's value in the context of databases.  
 A) Yes, if the stored attribute is derived from a date-related attribute like Birth\_date and Age  
 B) No, as it violates the principle of atomicity in database design  
 C) It depends on the specific use case and data requirements  
 D) Yes, if the stored attribute is used for calculations or computations frequently  
 Answer: C) It depends on the specific use case and data requirements  
  
6. LEVEL: Create  
 Question: Generate a multivalued attribute example for an object in the context of databases.  
 A) Colors (Red, Green, Blue) for a car with multiple paint jobs  
 B) Age\_range (18-25, 26-30, 31-40) for a person's age group  
 C) College\_degrees ('Bachelor', 'Master', 'Doctorate') for a student's academic history  
 D) Salary (30000, 75000, 120000) for employees' income levels  
 Answer: A) Colors (Red, Green, Blue) for a car with multiple paint jobs

* Question: Create six multiple choice question and answer of the question with the Authentication concept

Response: Question Level: Remember  
Question: Define Authentication?  
A) A system used for data partitioning  
B) The process of checking a user's identity  
C) A technique used for digital signatures  
D) A form of customer categorization in supermarkets  
Answer: B) The process of checking a user's identity  
  
Question Level: Understand  
Question: Explain the purpose of Authentication?  
A) To verify the integrity of data  
B) To ascertain whether a user is indeed a specific user or one from an authorized class  
C) To ensure that a digital signature comes from the originator  
D) To categorize customers in a supermarket  
Answer: B) To ascertain whether a user is indeed a specific user or one from an authorized class  
  
Question Level: Apply  
Question: Solve the following scenario: A user is trying to access a sensitive database. How can authentication ensure that this user is authorized?  
A) By comparing parameters against a database  
B) By tracking previous queries to ensure that a combination of queries does not reveal sensitive data  
C) By making each digital signature a function of the message and a unique secret number of the signer  
D) By checking that the signature comes from the originator  
Answer: B) By tracking previous queries to ensure that a combination of queries does not reveal sensitive data  
  
Question Level: Analyze  
Question: Compare Authentication with Classification in terms of their purpose and application.  
A) Authentication is used for ascertaining whether a user is indeed a specific user or one from an authorized class, while Classification is used for checking the integrity of data.  
B) Authentication is used for categorizing customers in a supermarket, while Classification is used for verifying the originator of a digital signature.  
C) Authentication is used for ensuring that a digital signature comes from the originator, while Classification is used for ascertaining whether a user is indeed a specific user or one from an authorized class.  
D) Authentication is used for tracking previous queries to ensure that a combination of queries does not reveal sensitive data, while Classification is used for partitioning the data so that different classes or categories can be identified based on combinations of parameters.  
Answer: D) Authentication is used for ascertaining whether a user is indeed a specific user or one from an authorized class, while Classification is used for partitioning the data so that different classes or categories can be identified based on combinations of parameters.  
  
Question Level: Evaluate  
Question: Justify why external characteristics about a user may also be considered in Authentication?  
A) To ensure that a combination of queries does not reveal sensitive data  
B) To verify the integrity of data  
C) To check that the signature comes from the originator  
D) To ensure that the user is indeed a specific user or one from an authorized class, and to consider certain external characteristics about the user may also be considered.  
Answer: D) To ensure that the user is indeed a specific user or one from an authorized class, and to consider certain external characteristics about the user may also be considered.  
  
Question Level: Create  
Question: Generate a scenario where Authentication can be applied and explain how it works in this scenario.  
A) Scenario: A bank wants to ensure that only authorized employees can access sensitive customer data. Solution: The bank can use authentication to check the identity of the employee before granting access to the sensitive data by comparing their credentials against a secure database.  
B) Scenario: A supermarket wants to categorize customers based on their shopping behavior. Solution: The supermarket can use classification instead of Authentication as it is used for identifying different classes or categories based on combinations of parameters.  
C) Scenario: A digital signature is being created by a user. Solution: The user can create a digital signature that depends on the message and a unique secret number of the signer using public key techniques to ensure counterfeitproofness.  
D) Scenario: A user is trying to access a database at midnight. Solution: The system can use Authentication to track external characteristics about the user such as working hours and deny access to the user during non-working hours.  
Answer: A) Scenario: A bank wants to ensure that only authorized employees can access sensitive customer data. Solution: The bank can use authentication to check the identity of the employee before granting access to the sensitive data by comparing their credentials against a secure database.

* Question: Create six multiple choice question and answer of the question with the Boyce-Codd normal form (BCNF) concept

Response: Level: Remember  
Question: Define Boyce-Codd Normal Form (BCNF)  
A) A simpler form of 3NF proposed historically as a stepping stone to 3NF.  
B) A stricter definition of a normal form that disallows functional dependencies that conform to the clause (b) in the 3NF definition.  
C) A type of database design that aims for achieving BCNF or 3NF for every relation schema.  
D) A concept that catches dependencies not allowed by 3NF.  
Answer: B) A stricter definition of a normal form that disallows functional dependencies that conform to the clause (b) in the 3NF definition.  
Level: Understand  
Question: Explain how BCNF is stricter than 3NF.  
A) Every relation in BCNF is also in 3NF, but a relation in 3NF is not necessarily in BCNF.  
B) Achieving the normalization status of just 1NF or 2NF is adequate for relational database design.  
C) The decomposition of a non-BCNF relation must be done by considering the additive decomposition requirement.  
D) The Boyce-Codd normal form does not have any functional dependencies based on mixing of independent multivalued attributes.  
Answer: A) Every relation in BCNF is also in 3NF, but a relation in 3NF is not necessarily in BCNF.  
Level: Apply  
Question: Solve the problem of potential redundancy of data in a non-BCNF relation by decomposing it into BCNF relations.  
A) Using the general definition of 3NF, analyze and decompose the given relation to yield a set of relations in 3NF.  
B) Consider the nonadditive decomposition requirement when decomposing a non-BCNF relation.  
C) Apply the test for the nonadditive join property of binary decompositions to the given relation.  
D) Use a general algorithm to convert any relation not in BCNF into a set of BCNF relations.  
Answer: D) Use a general algorithm to convert any relation not in BCNF into a set of BCNF relations.  
Level: Analyze  
Question: Compare and contrast the differences between 3NF and BCNF with regards to functional dependencies.  
A) 3NF allows functional dependencies that conform to the clause (b) in the 3NF definition, while BCNF disallows them.  
B) Both 3NF and BCNF allow functional dependencies that conform to the clause (b) in the 3NF definition.  
C) A relation in 3NF is always in BCNF.  
D) Achieving the normalization status of just 1NF or 2NF is considered adequate for relational database design.  
Answer: A) 3NF allows functional dependencies that conform to the clause (b) in the 3NF definition, while BCNF disallows them.  
Level: Evaluate  
Question: Determine if a relation R shown in Figure 14.13(b) from the document is in BCNF based on the given information.  
A) The relation R is not in BCNF since it has functional dependencies that conform to the clause (b) in the 3NF definition.  
B) The relation R is in BCNF since it does not have functional dependencies that conform to the clause (b) in the 3NF definition.  
C) It cannot be determined whether the relation R is in BCNF or not based on the given information.  
D) The relation R is in 3NF but not in BCNF because it has a prime attribute.  
Answer: A) The relation R is not in BCNF since it has functional dependencies that conform to the clause (b) in the 3NF definition.  
Level: Create  
Question: Generate an example of a relation that violates BCNF and demonstrate how it can be decomposed into BCNF relations.  
A) Consider a relation TEACH with the following dependencies: FD1: {Student, Course} Instructor, FD2: Instructor Course. Decompose this relation to yield BCNF relations by decomposing on the Instructor attribute.  
B) Generate an example of a relation with two or more columns that always has a multivalued dependency (MVD). Demonstrate how MVD arises in this example.  
C) Develop an example of a relation in 4NF and demonstrate how it can be decomposed to yield relations in BCNF.  
D) Generate an example of a relation with independent multivalued attributes mixed into a single table and demonstrate how this violates the BCNF definition. Then, suggest how to resolve this issue by normalizing the relation.  
Answer: A) Consider a relation TEACH with the following dependencies: FD1: {Student, Course} Instructor, FD2: Instructor Course. Decompose this relation to yield BCNF relations by decomposing on the Instructor attribute.  
Level and Page Source:  
Question: What is multivalued dependency (MVD)? When does it arise?  
A) A type of functional dependency that occurs when a single attribute depends on multiple values of another attribute. It arises in a relation with two or more columns.  
B) A concept that catches dependencies not allowed by 3NF. It does not have any functional dependencies based on mixing of independent multivalued attributes.  
C) A stronger form of 3NF.  
D) The decomposition of a non-BCNF relation must be done by considering the nonadditive decomposition requirement.  
Answer: A) A type of functional dependency that occurs when a single attribute depends on multiple values of another attribute. It arises in a relation with two or more columns.  
Level and Page Source:  
Question: Does a relation with two or more columns always have an MVD? Show with an example.  
A) Yes, every relation with two or more columns has an MVD. An example is the relation TEACH with dependencies: FD1: {Student, Course} Instructor, FD2: Instructor Course.  
B) No, not every relation with two or more columns has an MVD. An example is the relation LOTS with dependencies: Area County\_name.in LOTS1A relation.  
C) Yes, a relation in BCNF always has an MVD.  
D) A relation with only one column cannot have an MVD.  
Answer: B) No, not every relation with two or more columns has an MVD. An example is the relation LOTS with dependencies: Area County\_name.in LOTS1A relation.  
Source: Page 502, 'Fundamentals of Database Systems Seventh Edition' PDF document.

* Question: Create six multiple choice question and answer of the question with the Candidate key concept

Response: LEVEL: Remember  
PAGE SOURCE: '/content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf (page 184)'  
Question: Define a candidate key in the context of databases.  
A) A unique identifier for each record  
B) The primary key of a database table  
C) A non-unique identifier for a group of records  
D) A secondary key used to index data  
Answer: A) A unique identifier for each record  
  
LEVEL: Understand  
PAGE SOURCE: '/content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf (page 184)'  
Question: Explain what various candidate keys are in the context of databases.  
A) Different types of primary keys used in a database table  
B) Non-unique identifiers for each record  
C) Alternative keys used to index data  
D) Unique identifiers for groups of records  
Answer: C) Alternative keys used to index data  
  
LEVEL: Apply  
PAGE SOURCE: '/content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf (page 184)'  
Question: Solve the following problem by identifying candidate keys for the given table:  
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Student(Student\_ID, FirstName, LastName, Department\_ID, GPA)  
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A) Student\_ID, Department\_ID, GPA  
B) FirstName, LastName, Department\_ID, GPA  
C) Student\_ID, FirstName, LastName, Department\_ID  
D) Student\_ID, Department\_ID  
Answer: A) Student\_ID, Department\_ID, GPA  
  
LEVEL: Analyze  
PAGE SOURCE: '/content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf (page 184)'  
Question: Compare and justify which candidate key would be the best choice for a table representing university courses and their prerequisites.  
A) Course\_ID, Prerequisite\_Course\_ID  
B) Course\_ID, Course\_Name  
C) Course\_ID, Department\_ID  
D) Course\_ID  
Answer: A) Course\_ID, Prerequisite\_Course\_ID (This key would uniquely identify each course and its prerequisites, ensuring data integrity.)  
  
LEVEL: Evaluate  
PAGE SOURCE: '/content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf (page 184)'  
Question: Determine if the following candidate key would be valid under any conditions for a table representing university students and their majors: Student\_ID, Major\_Name, Major\_Advisor.  
A) Yes, as it uniquely identifies each student and their major information  
B) No, as it does not account for multiple advisors per major  
C) Yes, but only if there is a unique combination of Student\_ID, Major\_Name, and Major\_Advisor for each student  
D) Yes, it is always valid regardless of the conditions  
Answer: C) Yes, but only if there is a unique combination of Student\_ID, Major\_Name, and Major\_Advisor for each student. (This key would ensure that each student's major information is uniquely identifiable.)  
  
LEVEL: Create  
PAGE SOURCE: '/content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf (page 1074)'  
Question: Generate a candidate answer for the following question using structural matching: "What are two main types of questions in question answering systems?"  
A) Informational Questions and Yes/No Questions  
B) Factoid Questions and Wh-Questions  
C) Closed-Ended Questions and Open-Ended Questions  
D) Opinionated Questions and Leading Questions  
Answer: B) Factoid Questions and Wh-Questions (Structural matching would identify the question categories by aligning the question with common question types.)

* Question: Create six multiple choice question and answer of the question with the Cardinality concept

Response: Level: Understand (Level 2)  
Question: Explain the definition of cardinality ratio in the context of database design.  
A) A measure of the size of a database  
B) A way to determine the number of relationships between two entities  
C) The total number of elements in an array or collection type  
D) The unique system-generated object identifiers created via reference types  
Answer: B) A way to determine the number of relationships between two entities  
  
Level: Evaluate (Level 5)  
Question: Justify cardinality ratios for the given entity relationship based on common-sense meaning.  
A) STUDENT - 1 : SOCIAL\_SECURITY\_CARD - N (Many to One)  
B) STUDENT - Many : TEACHER - 1 (Many to One)  
C) CLASSROOM - 1 : WALL - Many (One to Many)  
D) COUNTRY - 1 : CURRENT\_PRESIDENT - 1 (One to One)  
E) COURSE - 1 : TEXTBOOK - N (One to Many)  
F) ITEM (that can be found in an order) - N : ORDER - 1 (Many to One)  
G) STUDENT - 1 : CLASS - Many (One to Many)  
H) CLASS - 1 : INSTRUCTOR - 1 (One to One)  
I) INSTRUCTOR - 1 : OFFICE - Many (One to Many)  
Answer: A) STUDENT - 1 : SOCIAL\_SECURITY\_CARD - N (Many to One), C) CLASSROOM - 1 : WALL - Many (One to Many), E) COURSE - 1 : TEXTBOOK - N (One to Many), F) ITEM (that can be found in an order) - N : ORDER - 1 (Many to One), G) STUDENT - 1 : CLASS - Many (One to Many), H) CLASS - 1 : INSTRUCTOR - 1 (One to One)  
  
Level: Create (Level 6)  
Question: Generate a cardinality ratio for the given entity relationship: COUNTRY - \_\_\_\_\_\_\_\_\_\_\_ CAPITAL  
A) One to One  
B) Many to One  
C) One to Many  
D) Many to Many  
Answer: A) One to One  
  
Level: Analyze (Level 4)  
Question: Compare and contrast object identifiers created via reference types with traditional keys of the basic relational model.  
A) Object identifiers are unique system-generated identifiers, while traditional keys are attributes that uniquely identify rows in a table.  
B) Traditional keys are unique system-generated identifiers, while object identifiers are attributes that uniquely identify rows in a table.  
C) Both object identifiers and traditional keys refer to the same attribute in a table.  
D) Object identifiers are used only for complex data types, while traditional keys can be used for simple data types.  
Answer: A) Object identifiers are unique system-generated identifiers, while traditional keys are attributes that uniquely identify rows in a table.  
  
Level: Remember (Level 1)  
Question: Define the CARDINALITY function in the context of databases.  
A) A built-in function to return the current number of elements in an array or collection type.  
B) A function used for calculating join attributes in a later join.  
C) A function that generates unique system-generated object identifiers via reference types.  
D) A function to determine the ordering beneficial for the next join in query optimization.  
Answer: A) A built-in function to return the current number of elements in an array or collection type.

* Question: Create six multiple choice question and answer of the question with the Cardinality ratios concept

Response: LEVEL: Understand (Level 2)  
Question: What is the meaning of the cardinality ratio in a binary relationship type?  
A) The number of entities involved in the relationship  
B) The maximum number of attributes in the relationship  
C) The total number of relationships between two entity types  
D) The maximum and minimum number of entities participating in the relationship  
Answer: D) The maximum and minimum number of entities participating in the relationship (Page Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, page 89)  
  
LEVEL: Analyze (Level 4)  
Question: In the WORKS\_FOR binary relationship type, what are the cardinality ratios for DEPARTMENT and EMPLOYEE entities?  
A) 1:M for both DEPARTMENT and EMPLOYEE  
B) M:N for DEPARTMENT and 1:N for EMPLOYEE  
C) 1:N for DEPARTMENT and N:M for EMPLOYEE  
D) N:M for both DEPARTMENT and EMPLOYEE  
Answer: B) M:N for DEPARTMENT and 1:N for EMPLOYEE (Page Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, page 89)  
  
LEVEL: Evaluate (Level 5)  
Question: Consider the MANAGES binary relationship in Figure 3.12, which represents a one-to-one cardinality ratio between DEPARTMENT and EMPLOYEE entities. How does this cardinality ratio relate to the miniworld constraints?  
A) Each department can be managed by any number of employees (N indicates there is no maximum number), but an employee can manage at most one department  
B) Each department can be managed by at most one employee, and each employee can manage a minimum of one department  
C) Each department must have at least one employee managing it, and each employee must manage at least one department  
D) A department can employ any number of employees, but an employee can only work for one department  
Answer: A) Each department can be managed by any number of employees (N indicates there is no maximum number), but an employee can manage at most one department (Page Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, page 738)  
  
LEVEL: Create (Level 6)  
Question: Generate three different composite keys for the binary relationship type STUDENT-SECTION and show how they can be represented in an ER schema diagram.  
A) Composite Key 1: Student ID, Section ID  
 ER Diagram Representation: {Student ID, Section ID}  
 Composite Key 2: Student Name, Section Name  
 ER Diagram Representation: {Student Name, Section Name}  
 Composite Key 3: Student ID, Course Code, Section ID  
 ER Diagram Representation: {Student ID, Course Code, Section ID}  
Answer: A) Correct (Page Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, page 114)  
  
LEVEL: Apply (Level 3)  
Question: Given the following binary relationships, suggest cardinality ratios based on common-sense meaning of the entity types for ITEM and ORDER.  
A) 1:N, with one order containing multiple items  
B) N:M, allowing an order to contain various items and each item to be part of multiple orders  
C) 1:1, assuming only a single item per order and vice versa  
D) 0:N, representing situations where orders may not have any items or items may not belong to any orders  
Answer: A) 1:N, with one order containing multiple items (Page Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, page 114)  
  
LEVEL: Remember (Level 1)  
Question: Define the cardinality ratio M:N.  
A) One entity can participate in multiple relationships with another entity type, and each of those entities can have multiple partners  
B) One entity can only be involved in a single relationship with another entity type, while each of those entities can have multiple partners  
C) One entity can participate in a single relationship with another entity type, and each of those entities can only have one partner  
D) One entity can have multiple relationships with another entity type, but each of those entities can only be involved in a single relationship  
Answer: A) One entity can participate in multiple relationships with another entity type, and each of those entities can have multiple partners (Page Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, page 89)

* Question: Create six multiple choice question and answer of the question with the Cartesian product concept

Response: Level: Remember  
Question: Define Cartesian Product (CP) in the context of databases.  
A) An operation that combines tuples from two relations to produce all possible combinations.  
B) A set operation that can be used to combine tuples from multiple relations, producing all possible combinations.  
C) A binary set operation which produces a new element by combining every member (tuple) from one relation with every member (tuple) from the other relation.  
D) A concept denoting the joining of three or more tables as a single joined table in databases.  
Answer: A) An operation that combines tuples from two relations to produce all possible combinations.  
LEVEL: Remember  
Question: What does CP operation generate?  
A) New element by combining every member (tuple) from one relation with every member (tuple) from the other relation.  
B) Tuples for each combination of tuplesone from R and one from S.  
C) A new relation Q with degree n + m attributes in that order, where R and S are the relations on which CP is applied.  
D) All possible tuple combinations from multiple relations.  
Answer: D) All possible tuple combinations from multiple relations.  
LEVEL: Understand  
Question: How many tuples will R S have if R has nR tuples and S has nS tuples?  
A) nR + nS  
B) nR \* nS  
C) nR \\* nS - 1  
D) nR / nS  
Answer: B) nR \* nS  
LEVEL: Apply  
Question: What is the degree of the resulting relation Q from R(A1, A2, , An) S(B1, B2, , Bm)?  
A) n + m - 1  
B) n + m  
C) n \* m  
D) n \* m + 1  
Answer: C) n \* m  
LEVEL: Analyze  
Question: What is the difference between CP and join operation?  
A) A join operation generates all possible tuple combinations, while CP does not.  
B) A join operation can be used with union compatible relations, while CP does not have this requirement.  
C) Both CP and join operations generate new tuples by combining every member (tuple) from one relation with every member (tuple) from the other relation.  
D) A join operation produces a result of R(A1, A2, , An) S(B1, B2, , Bm), while CP does not have this format.  
Answer: D) A join operation produces a result of R(A1, A2, , An) S(B1, B2, , Bm), while CP does not have this format.  
LEVEL: Create  
Question: Develop an example of n-ary Cartesian Product operation in the context of databases.  
A) R(A1, A2, , An) S(B1, B2, , Bm) will produce a relation Q with degree n + m attributes Q(A1, A2, , An, B1, B2, , Bm), where R and S are any two relations.  
B) If R has three tuples (1, 2, 3) and S has four tuples (4, 5, 6, 7), then the resulting relation Q will have 3 \* 4 = 12 tuples, each consisting of a combination of one tuple from R and one tuple from S.  
C) R(A1, A2, , An) S(B1, B2, , Bm) will produce all possible combinations of tuples from n underlying relations R and S in the order specified.  
D) Both A and C are correct examples of n-ary Cartesian Product operation.  
Answer: D) Both A and C are correct examples of n-ary Cartesian Product operation.

* Question: Create six multiple choice question and answer of the question with the Closure concept

Response: Level: Remember  
Question: What is the closure of F?  
A) A set of all possible functional dependencies that can be inferred from a given set F  
B) A method to end the iteration after all tuples have been generated  
C) A physical operator not lending itself to the iterator interface concept  
D) The antimonotonicity property that helps reduce the search space of possible solutions  
Answer: A) A set of all possible functional dependencies that can be inferred from a given set F (F+)  
  
Level: Understand  
Question: Explain the meaning and implications of attributes or sets of attributes in a relation using the closure concept.  
A) It helps to determine which attributes are dependent on others in a relation  
B) It is used to generate all possible dependencies that can be inferred from the given set F  
C) It is a method to end the iteration after all tuples have been generated  
D) It is a physical operator not lending itself to the iterator interface concept  
Answer: A) It helps to determine which attributes are dependent on others in a relation (implications of attributes or sets of attributes in a relation)  
  
Level: Apply  
Question: Given a relation schema with functional dependencies, solve for the closure of F.  
A) Define the set of all possible functional dependencies that can be inferred from the given set F  
B) Use the apriori algorithm to find frequent itemsets  
C) Close() method ends the iteration after all tuples have been generated  
D) Generate a materialized relation for input tuples  
Answer: A) Define the set of all possible functional dependencies that can be inferred from the given set F (F+)  
  
Level: Analyze  
Question: Compare and contrast closure concept with antimonotonicity property.  
A) Closure is a method to end the iteration after all tuples have been generated, while antimonotonicity helps to reduce the search space of possible solutions  
B) Antimonotonicity helps to determine which attributes are dependent on others in a relation, while closure is used to generate all possible dependencies that can be inferred from the given set F  
C) Closure is a physical operator not lending itself to the iterator interface concept, while antimonotonicity is the downward closure property  
D) Closure and antimonotonicity are the same properties, used interchangeably in the context of database systems  
Answer: B) Antimonotonicity helps to determine which attributes are dependent on others in a relation (downward closure property), while closure is used to generate all possible dependencies that can be inferred from the given set F  
  
Level: Evaluate  
Question: Determine whether the following statement is true or false. The antimonotonicity property is useful in understanding the meaning and implications of attributes or sets of attributes in a relation for the closure concept.  
A) True  
B) False  
Answer: A) True (Antimonotonicity helps to determine which attributes are dependent on others in a relation, and it assists in inferring possible functional dependencies that can be included in the closure of F.)  
  
Level: Create  
Question: Generate a new relation schema with functional dependencies and find its closure.  
A) Define the set of all possible functional dependencies for the given relation schema  
B) Use the apriori algorithm to find frequent itemsets for the given transaction data  
C) Apply pipelining strategy for processing input tuples efficiently  
D) Define the closure of F for the given relation schema  
Answer: D) Define the closure of F for the given relation schema (e.g., RELATION\_SCHEMA (A, B, C, D); F = {A B, C D}; F+ = {A B, A C, A D, B C, B D, C A, D A})

* Question: Create six multiple choice question and answer of the question with the Concurrent Transactions concept

Response: LEVEL: Remember (Define)  
PAGE SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, page 760  
Question: What is defined as an executing program that forms a logical unit of database processing?  
A) Serializability  
B) Concurrency Control Protocol  
C) Database Items  
D) Transaction  
Answer: Transaction  
  
LEVEL: Understand (Explain)  
PAGE SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, page 760-763  
Question: Describe the simple model of transaction execution based on read and write database operations.  
A) The model assumes a single user environment where transactions do not interact with each other.  
B) The model allows multiple transactions to run concurrently but does not ensure data consistency or serializability.  
C) The model defines a transaction as an executing program that includes one or more database access operations, such as insertion, deletion, modification (update), or retrieval operations.  
D) The model ensures that each transaction is executed sequentially, without any overlapping of operations.  
Answer: C  
  
LEVEL: Apply (Solve)  
PAGE SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, page 763-766  
Question: Consider the following concurrent transactions: T1 - update A to 5, T2 - read A, T3 - update A to 10. If serializability is violated, what should be done?  
A) Abort transaction T1 and T3, allow T2 to complete.  
B) Allow all transactions to continue executing without any interference.  
C) Roll back T2, abort T1 and T3, restart the transactions from their beginning.  
D) Execute T1, T2, and then T3 in that order to maintain serializability.  
Answer: C  
  
LEVEL: Analyze (Compare)  
PAGE SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, page 792-795 and 798-800  
Question: Compare and contrast timestamp ordering concurrency control techniques and multiversion concurrency control techniques in terms of locking granularity and overhead.  
A) Timestamp ordering uses coarse-grained locking, while multiversion concurrency control uses fine-grained locking with a higher overhead.  
B) Multiversion concurrency control uses coarse-grained locking, while timestamp ordering uses fine-grained locking with a lower overhead.  
C) Both techniques use the same level of locking granularity and have similar levels of overhead.  
D) Timestamp ordering uses fine-grained locking with lower overhead, while multiversion concurrency control uses coarse-grained locking with higher overhead.  
Answer: A  
  
LEVEL: Evaluate (Justify)  
PAGE SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, page 759  
Question: Justify the need for concurrency control techniques in multiuser systems based on informal examples.  
Answer: Concurrency control techniques are needed to prevent data inconsistencies and conflicts that can arise when multiple users attempt to access and modify the same database items simultaneously, as shown by informal examples in the text.  
  
LEVEL: Create (Generate)  
PAGE SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, page 746  
Question: Generate an example of a multiuser database system where concurrent execution of transactions can take place using the concepts discussed in section 20.1.1.  
Answer: Example: A bank database system with multiple tellers and customers. Each customer may deposit money, withdraw money, check account balance, or transfer funds between accounts. If a customer attempts to make these operations simultaneously while another customer is also performing similar actions on the same account(s), concurrency control techniques are needed to ensure data consistency and prevent conflicts.

* Question: Create six multiple choice question and answer of the question with the COUNT conmmand

Response: Level: Remember (1)  
Question: What does COUNT (\*) return in SQL?  
A) The number of columns in a table  
B) The number of unique values in a column  
C) The total sum of all numbers in a column  
D) The number of rows in the result of a query  
Answer: D) The number of rows in the result of a query (Page Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, Page 231)  
  
Level: Understand (2)  
Question: What does COUNT(DISTINCT Salary) do in SQL?  
A) Returns the number of unique values in a column named 'Salary'  
B) Returns the total sum of all values in a column named 'Salary'  
C) Returns the number of rows that have NULL value in 'Salary' column  
D) Returns the number of rows in the result of the query  
Answer: A) Returns the number of unique values in a column named 'Salary' (Page Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, Page 231)  
  
Level: Apply (3)  
Question: If we have the following query SELECT COUNT(\*) FROM EMPLOYEE WHERE Salary > 40000, what will it return?  
A) The number of employees with salary greater than 40000  
B) The total number of employees  
C) The total sum of all salaries in the 'EMPLOYEE' table  
D) An error because we are using COUNT(\*) instead of COUNT(Salary)  
Answer: A) The number of employees with salary greater than 40000 (Page Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, Page 231)  
  
Level: Analyze (4)  
Question: In the context of the given document, which is more efficient, COUNT(\*) or COUNT(DISTINCT)?  
A) COUNT(\*), because it counts rows instead of unique values  
B) COUNT(DISTINCT), because it only counts unique values  
C) Both are equally efficient as they count the same thing  
D) It depends on the context and the purpose of the query  
Answer: B) COUNT(DISTINCT), because it only counts unique values (Page Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, Page 231)  
  
Level: Evaluate (5)  
Question: Given the following query Q5: SELECT Lname, Fname FROM EMPLOYEE WHERE (SELECT COUNT (\*) FROM DEPENDENT WHERE Ssn = Essn ) > = 2, what does it determine?  
A) The last names and first names of employees with no dependents  
B) The last names and first names of employees with at least two dependents  
C) The last names and first names of employees with less than two dependents  
D) The number of dependents for each employee  
Answer: B) The last names and first names of employees with at least two dependents (Page Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, Page 231)  
  
Level: Create (6)  
Question: Develop a SQL query that retrieves the department number and the total number of employees who earn more than $40,000 in each department.  
A) SELECT Dno, COUNT(\*) FROM EMPLOYEE WHERE Salary > 40000 GROUP BY Dno;  
B) SELECT Dno, (SELECT COUNT(\*) FROM EMPLOYEE WHERE Salary > 40000) AS TotalEmployees FROM EMPLOYEE GROUP BY Dno;  
C) SELECT Dno, COUNT (\*) FROM EMPLOYEE WHERE Salary > 40000 GROUP BY Dno HAVING TotalEmployees > 5;  
D) Both A and B are correct.  
Answer: B) SELECT Dno, (SELECT COUNT(\*) FROM EMPLOYEE WHERE Salary > 40000) AS TotalEmployees FROM EMPLOYEE GROUP BY Dno (Page Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, Page 234)

* Question: Create six multiple choice question and answer of the question with the CREATE TABLE command

Response: Level: 1 (Remember)  
Question: What is used to define a table in SQL?  
A) CREATE INDEX  
B) CREATE TRIGGER  
C) CREATE ASSERTION  
D) CREATE TABLE  
Answer: D) CREATE TABLE  
  
Level: 2 (Understand)  
Question: Explain the role of a CHECK clause in a CREATE TABLE statement.  
A) It is used to check constraints for all columns in the table  
B) It is used to check constraints for each row individually and is checked whenever a row is inserted or modified  
C) It is used to specify more general constraints using the CREATE ASSERTION statement of SQL  
D) None of the above  
Answer: B) It is used to check constraints for each row individually and is checked whenever a row is inserted or modified  
  
Level: 3 (Apply)  
Question: Solve the following example of a CREATE TABLE statement with a CHECK clause:  
```sql  
CREATE TABLE DEPARTMENT(  
 Dept\_ID INT PRIMARY KEY,  
 Dept\_Name VARCHAR(100),  
 Dept\_create\_date DATE CHECK (Dept\_create\_date <= Mgr\_start\_date)  
);  
```  
Assuming that Mgr\_start\_date is a column in another table and it's value is 2022-05-01. Can we insert a row with a Dept\_create\_date of 2022-04-30 for the DEPARTMENT table?  
A) Yes, because the CHECK clause is not applicable to other tables  
B) No, because the Dept\_create\_date (2022-04-30) is earlier than Mgr\_start\_date (2022-05-01)  
C) Yes, because the CHECK clause only applies when a row is updated and not inserted  
D) No, because the CHECK clause only checks for the current date and not past dates  
Answer: B) No, because the Dept\_create\_date (2022-04-30) is earlier than Mgr\_start\_date (2022-05-01)  
  
Level: 4 (Analyze)  
Question: Compare and contrast CHECK clauses and CREATE ASSERTION in SQL.  
A) Both are used to check constraints for a table, but CHECK clauses are checked only when tuples are inserted or updated while CREATE ASSERTION is always checked  
B) Both are used to check constraints for a table, but CHECK clauses can be applied to individual attributes, domains, and tuples while CREATE ASSERTION is more general  
C) Both are used to create new tables, but CHECK clauses are used to specify simple constraints while CREATE ASSERTION is used for complex constraints  
D) None of the above  
Answer: A) Both are used to check constraints for a table, but CHECK clauses are checked only when tuples are inserted or updated while CREATE ASSERTION is always checked  
  
Level: 5 (Evaluate)  
Question: Determine if the following statement is true or false: "A schema designer should use CHECK on attributes, domains, and tuples only when he or she is sure that the constraint can only be violated by deleting rows from the table."  
A) True  
B) False  
Answer: B) False (The CHECK clause is used to check constraints for a table, but it is checked only when tuples are inserted or updated and not deleted)  
  
Level: 6 (Create)  
Question: Generate an example of a CREATE TABLE statement with multiple attributes and a CHECK clause.  
A) ```sql  
CREATE TABLE EMPLOYEE(  
 Employee\_ID INT PRIMARY KEY,  
 First\_Name VARCHAR(50),  
 Last\_Name VARCHAR(50),  
 Age INT CHECK (Age >= 18 AND Age <= 65)  
);  
```  
Answer: A) ```sql  
CREATE TABLE EMPLOYEE(  
 Employee\_ID INT PRIMARY KEY,  
 First\_Name VARCHAR(50),  
 Last\_Name VARCHAR(50),  
 Age INT CHECK (Age >= 18 AND Age <= 65)  
);  
```

* Question: Create six multiple choice question and answer of the question with the Data integrity concept

Response: Level: Remember  
Question: Define "Data Integrity" (Fundamentals of Database Systems Seventh Edition, Page 1167)  
A) A measure of data quality  
B) The ability to ensure the accuracy and consistency of data over its entire lifecycle  
C) A method used for automatic repairing of incorrect data  
D) The process of linking records in databases  
Answer: B) The ability to ensure the accuracy and consistency of data over its entire lifecycle  
  
Level: Understand  
Question: Explain what is meant by "integrity semantics verification" (Fundamentals of Database Systems Seventh Edition, Page 1167)  
A) Verifying that data types are correct for each data item  
B) Ensuring the accuracy and consistency of data over its entire lifecycle  
C) Automatically repairing incorrect data  
D) Linking records in databases  
Answer: B) Ensuring the accuracy and consistency of data over its entire lifecycle  
  
Level: Apply  
Question: Solve the following scenario where you are given a database application with certain integrity constraints that must hold for the data. How would you define these constraints using the DBMS?  
A) By specifying a data type for each data item and defining relationships between records in different files if needed  
B) By linking records in databases to provide more effective integrity semantics verification  
C) By automatically repairing incorrect data  
D) By generating new relationships as they arise  
Answer: A) By specifying a data type for each data item and defining relationships between records in different files if needed  
  
Level: Analyze  
Question: Compare "integrity semantics verification" and "record linkage" in the context of database security.  
A) Both are methods used to ensure the accuracy and consistency of data over its entire lifecycle, with record linkage being a more complex type of constraint that involves specifying relationships between records in different files  
B) Both are methods used for automatic repairing of incorrect data  
C) Integrity semantics verification is a simple mechanism such as quality stamps posted on Web sites, while record linkage provides tools for the assessment of data quality  
D) Record linkage is a method used to link records in databases, while integrity semantics verification is a process that ensures the accuracy and consistency of data over its entire lifecycle  
Answer: A) Both are methods used to ensure the accuracy and consistency of data over its entire lifecycle, with record linkage being a more complex type of constraint that involves specifying relationships between records in different files  
  
Level: Evaluate  
Question: Determine whether the following statement is true or false. "The ETL tools widely used to load data in data warehouses automatically repair incorrect data."  
A) True  
B) False  
Answer: B) False (These tools are presently grappling with issues related to ensuring data integrity, but they do not automatically repair incorrect data.)  
  
Level: Create  
Question: Generate a potential technique for ensuring data integrity that is not mentioned in the given context.  
A) Using machine learning algorithms to predict and correct errors in real-time  
B) Implementing an audit trail system to track changes made to the database  
C) Implementing access controls to restrict unauthorized users from modifying data  
D) Linking records in databases using unique identifiers to maintain relationships  
Answer: A) Using machine learning algorithms to predict and correct errors in real-time

* Question: Create six multiple choice question and answer of the question with the Data Model concept

Response: Level: Remember  
Question: Define the Concept of a Data Model (Fundamentals of Database Systems Seventh Edition, Page 70)  
A) A data model is a representation of a real-world system in a database.  
B) A data model is a software application used to manage databases.  
C) A data model is the physical structure of a database.  
D) A data model is the process of designing a database.  
Answer: A) A data model is a representation of a real-world system in a database.  
  
Level: Understand  
Question: Explain the concept of a multidimensional data model (Fundamentals of Database Systems Seventh Edition, Page 70)  
A) A multidimensional data model is a type of data model used for OLAP and decision-support technologies.  
B) A multidimensional data model is a database that provides access to disjoint and heterogeneous databases.  
C) A multidimensional data model is the physical structure of a data warehouse.  
D) A multidimensional data model supports time series and trend analyses.  
Answer: A) A multidimensional data model is a type of data model used for OLAP and decision-support technologies.  
  
Level: Apply  
Question: Solve the following problem by determining the appropriate data model for an OLAP and decision-support technology system (Fundamentals of Database Systems Seventh Edition, Page 70)  
A) A relational data model  
B) A network data model  
C) A multidimensional data model  
D) A hierarchical data model  
Answer: C) A multidimensional data model  
  
Level: Analyze  
Question: Compare and contrast data warehouses and transactional databases (Fundamentals of Database Systems Seventh Edition, Page 1116)  
A) Data warehouses support more historical data than transactional databases but are subject to modification.  
B) Transactional databases support more historical data than data warehouses and are non-volatile.  
C) Data warehouses are nonvolatile and typically not subject to modification, while transactional databases are volatile and subject to frequent modifications.  
D) Data warehouses are real-time with continuous insertions, while transactional databases are nonreal-time with periodic insertions.  
Answer: C) Data warehouses are nonvolatile and typically not subject to modification, while transactional databases are volatile and subject to frequent modifications.  
  
Level: Evaluate  
Question: Determine whether the following statement is true or false: "Data warehouses support real-time analysis of data." (Fundamentals of Database Systems Seventh Edition)  
A) True  
B) False  
Answer: B) False  
  
Level: Create  
Question: Generate a question that requires a description of the main concepts involved in Question Answering.  
A) Describe the main concepts involved in Question Answering systems.  
Answer: A) Describe the main concepts involved in Question Answering systems.

* Question: Create six multiple choice question and answer of the question with the Data structure concept

Response: LEVEL: Remember  
PAGE SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf (Page 470)  
Question: Define Data Structure in the context of Database Systems.  
A) A database schema that organizes data for efficient access and modification.  
B) A collection of related variables or data items with their respective data types and allowable operations.  
C) A data model that represents the logical structure of a database.  
D) The process of creating a database from raw data.  
Answer: B) A collection of related variables or data items with their respective data types and allowable operations.  
  
LEVEL: Understand  
PAGE SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf (Page 470)  
Question: Explain the significance of Data Structures in Database Systems.  
A) They help in optimizing database performance by reducing the number of disk accesses.  
B) They provide a way to manage and manipulate data efficiently.  
C) Both A and B are correct.  
D) They allow for easy integration with other databases.  
Answer: C) Both A and B are correct.  
  
LEVEL: Apply  
PAGE SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf (Page 1074, Page\_Label: 1075)  
Question: Solve the following problem using a Data Structure: Given a list of transactions with customer details and item information, how can we efficiently retrieve all transactions made by a specific customer?  
A) Use an array to store the transaction data. Iterate through the array and compare each transaction with the given customer ID.  
B) Use a hash table to store the transaction data where the key is the customer ID and the value is the transaction details. Retrieve the value associated with the given customer ID.  
C) Use a linked list to store the transaction data. Traverse the list until the customer ID matches the given customer ID.  
D) Use a binary search tree to store the transaction data where each node contains the transaction details and the key is the customer ID. Search for the transaction of the specific customer using the binary search algorithm.  
Answer: B) Use a hash table to store the transaction data where the key is the customer ID and the value is the transaction details. Retrieve the value associated with the given customer ID.  
  
LEVEL: Analyze  
PAGE SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf (Page 1083, Page\_Label: 1084)  
Question: Compare and contrast Data Mining and Question Answering Systems in terms of their purpose and methodology.  
A) Both aim to extract useful information from large datasets but differ in their approach as data mining is focused on finding patterns while question answering systems answer specific questions posed by users.  
B) Both are used for querying databases, but Data Mining is more complex due to its focus on discovering new knowledge, whereas Question Answering Systems aim to retrieve facts from the existing data.  
C) Both involve processing large datasets, but Data Mining deals with unstructured data while Question Answering Systems only work with structured data.  
D) Both are concerned with extracting patterns or relationships from a dataset, but Data Mining requires a specific query while Question Answering Systems can answer open-ended questions.  
Answer: A) Both aim to extract useful information from large datasets but differ in their approach as data mining is focused on finding patterns while question answering systems answer specific questions posed by users.  
  
LEVEL: Evaluate  
PAGE SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf (Page 70, Page\_Label: 71)  
Question: Justify the importance of Conceptual Data Modeling in Database Design.  
A) It helps to ensure consistency across different database views and schemas, improving data integrity and reducing errors.  
B) It simplifies the communication between stakeholders by providing a common language for discussing the database structure.  
C) Both A and B are correct.  
D) It allows for easier migration of databases between platforms.  
Answer: C) Both A and B are correct.  
  
LEVEL: Create  
PAGE SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf (Page 470, Page\_Label: 471)  
Question: Develop a factoid question that could be answered by a Question Answering System based on the context of Database Design Theory and Normalization.  
A) Who is the author of "Fundamentals of Database Systems Seventh Edition"?  
B) What are the six phases involved in the data mining process?  
C) Which data structure is primarily used to manage and manipulate data efficiently in a database system?  
D) In which city was the first relational database management system (RDBMS) developed?  
Answer: C) Which data structure is primarily used to manage and manipulate data efficiently in a database system?

* Question: Create six multiple choice question and answer of the question with the Data type concept

Response: Question Level: Remember (Define)  
Question: What is an atom constructor used for?  
A) To represent complex-structured objects  
B) To create a simple record  
C) To represent all basic atomic values  
D) To specify collections (multivalued types and attributes)  
Answer: C) To represent all basic atomic values  
  
Question Level: Understand (Explain)  
Question: Describe the role of a Collection type constructor.  
A) It represents all basic atomic values  
B) It is used to create complex-structured objects  
C) It allows part of an object or literal value to include a collection of other objects or values when needed  
D) It is used to specify comples-structured objects rather than just simple (flat) records  
Answer: C) It allows part of an object or literal value to include a collection of other objects or values when needed  
  
Question Level: Apply (Solve)  
Question: If we have a table with attributes 'Name', 'Age' and 'Address', what type constructor would allow us to include a collection of multiple addresses for one person?  
A) set(T)  
B) tuple(T)  
C) dictionary(K,T)  
D) array(T)  
Answer: D) array(T)  
  
Question Level: Analyze (Compare)  
Question: Compare and contrast the atom constructor and tuple constructor.  
A) They are both used to represent all basic atomic values  
B) The atom constructor is used to create complex-structured objects, while the tuple constructor creates simple records  
C) The atom constructor allows part of an object or literal value to include a collection of other objects or values when needed, while the tuple constructor does not  
D) Both are type generators and can create many different types  
Answer: B) The atom constructor is used to represent all basic atomic values, while the tuple constructor creates structured values and objects of the form <a>  
  
Question Level: Evaluate (Justify)  
Question: Determine whether the following statement is true or false. If a collection value must be of the same type, then using set( string), set(integer), and set(Employee) are valid collections for a single set.  
A) True  
B) False  
Answer: A) True  
  
Question Level: Create (Generate)  
Question: Generate an example of creating a UDT in SQL syntax.  
A) CREATE TYPE Employee AS (FirstName varchar(50), LastName varchar(50), Age int, Address varchar(255));  
B) CREATE TYPE Address AS (Street varchar(100), City varchar(100), State varchar(100), ZipCode int);  
C) CREATE TYPE Employee AS (FirstName real, LastName real, Age real, Address real);  
D) CREATE TYPE Employee AS (FirstName set(string), LastName set(integer), Age set(Employee), Address set(Address));  
Answer: A) CREATE TYPE Employee AS (FirstName varchar(50), LastName varchar(50), Age int, Address varchar(255));

* Question: Create six multiple choice question and answer of the question with the Database Security concept

Response: Question Level: Remember  
Question: Define Database Security?  
A) The process of protecting a database from unauthorized access.  
B) The process of optimizing a database for better performance.  
C) The process of backing up and recovering data in a database.  
D) The process of designing a database schema.  
Answer: A) The process of protecting a database from unauthorized access. (LEVEL: 1, PAGE SOURCE: '/content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf')  
  
Question Level: Understand  
Question: Explain the concept of "Discretionary security mechanisms".  
A) Mechanisms used to control access to database based on predefined roles and privileges.  
B) Mechanisms used to optimize the performance of a database.  
C) Mechanisms used to protect data from being lost or corrupted.  
D) Mechanisms used to enforce specific rules for data manipulation in a database.  
Answer: A) Mechanisms used to control access to database based on predefined roles and privileges. (LEVEL: 2, PAGE SOURCE: '/content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf')  
  
Question Level: Apply  
Question: Solve the scenario where a DBMS needs to provide techniques for certain users or user groups to access selected portions of a database without gaining access to the rest of the database.  
A) Implement discretionary security mechanisms.  
B) Implement encryption methods.  
C) Optimize the performance of the database.  
D) Implement inference control methods.  
Answer: A) Implement discretionary security mechanisms. (LEVEL: 3, PAGE SOURCE: '/content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf')  
  
Question Level: Analyze  
Question: Compare and contrast discretionary security mechanisms with encryption methods in the context of database security.  
A) Discretionary security mechanisms are used to control access while encryption is used to protect data integrity.  
B) Both discretionary security mechanisms and encryption are used to control access.  
C) Encryption is used to optimize the performance of a database, while discretionary security mechanisms are used to enforce specific rules for data manipulation.  
D) Discretionary security mechanisms are used to protect sensitive information from most of the database systems users, while encryption is used to prevent unauthorized access to the entire database.  
Answer: D) Discretionary security mechanisms are used to protect sensitive information from most of the database systems users, while encryption is used to prevent unauthorized access to the entire database. (LEVEL: 4, PAGE SOURCE: '/content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf')  
  
Question Level: Evaluate  
Question: Justify why it's important for a database management system to have strong security measures in place.  
A) Because the system levels at which various security functions should be enforced are important.  
B) Because security of an overall system is only as strong as its weakest link, a database may be compromised even if it would have been perfectly secure on its own merits.  
C) Because some information may be deemed to be private and cannot be accessed legally by unauthorized organizations or persons.  
D) All of the above.  
Answer: D) All of the above. (LEVEL: 5, PAGE SOURCE: '/content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf')  
  
Question Level: Create  
Question: Generate a sentence that describes the primary goal of database security.  
A) The primary goal of database security is to ensure data integrity and availability.  
B) The primary goal of database security is to optimize the performance of a database.  
C) The primary goal of database security is to protect data from being lost or corrupted.  
D) The primary goal of database security is to control access to specific data files, records, or fields.  
Answer: D) The primary goal of database security is to control access to specific data files, records, or fields. (LEVEL: 6, PAGE SOURCE: '/content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf')

* Question: Create six multiple choice question and answer of the question with the Data Definition Language concept

Response: Level: Remember  
Question: Define Data Definition Language (DDL) in the context provided?  
A) A set of instructions used to create, modify, or delete objects within a database  
B) A programming language used to query databases  
C) A tool for managing and optimizing databases  
D) A method for converting data between different formats  
Answer: A) A set of instructions used to create, modify, or delete objects within a database  
  
Level: Understand  
Question: Explain the purpose of Data Definition Language (DDL) in the context provided?  
A) To facilitate communication between databases and programming languages  
B) To allow users to access and manipulate data directly from the DBMS  
C) To manage the structure of a database, including tables, views, and indexes  
D) To perform calculations on datasets within a database  
Answer: C) To manage the structure of a database, including tables, views, and indexes  
  
Level: Apply  
Question: Solve the following DDL statement for creating a table named 'Employees' in SQL:  
A) Employee(id INTEGER PRIMARY KEY, name VARCHAR(255), department\_id INTEGER, salary REAL);  
B) TABLE Employee(id INT AUTO\_INCREMENT, name VARCHAR NOT NULL, department\_id INT, salary DECIMAL(10, 2));  
C) CREATE EMPLOYEE (ID INT PRIMARY KEY, NAME VARCHAR(255), DEPARTMENT\_ID INTEGER, SALARY REAL);  
D) TABLE Employee (id INT, name VARCHAR NOT NULL, department\_id INT, salary DECIMAL(10, 2));  
Answer: A) Employee(id INTEGER PRIMARY KEY, name VARCHAR(255), department\_id INTEGER, salary REAL);  
  
Level: Analyze  
Question: Compare the DDL approach and the API approach for accessing a database from application programs.  
A) The DDL approach requires users to learn a new language, while the API approach uses general-purpose programming languages  
B) Both approaches suffer from the impedance mismatch problem  
C) In the DDL approach, checking can be done at compile time, while in the API approach it has to be done at runtime  
D) The DDL approach is used mainly by DBMS software, while the API approach is accessed directly by users  
Answer: A) The DDL approach requires users to learn a new language, while the API approach uses general-purpose programming languages  
  
Level: Evaluate  
Question: Justify the use of Data Definition Language (DDL) in the context provided.  
A) It helps manage the structure of a database and ensures data integrity  
B) It improves the performance of the DBMS  
C) It enables users to access and manipulate data directly from the DBMS  
D) It simplifies the process of converting data between different formats  
Answer: A) It helps manage the structure of a database and ensures data integrity  
  
Level: Create  
Question: Generate a DDL statement for creating a table named 'Orders' with columns: order\_id (primary key), customer\_id, product\_id, quantity, and total\_price.  
Answer: CREATE TABLE Orders (order\_id INTEGER PRIMARY KEY, customer\_id INTEGER, product\_id INTEGER, quantity INTEGER, total\_price REAL);

* Question: Create six multiple choice question and answer of the question with the DELETE command

Response: Level: 1 (Remember)  
Question: Define the purpose of the DELETE command in SQL.  
A) To insert data into a table  
B) To modify attribute values of one or more selected tuples  
C) To create a new table from an existing one  
D) To remove tuples from a relation  
Answer: D) To remove tuples from a relation  
  
Level: 2 (Understand)  
Question: Explain how the DELETE command works in SQL with respect to selecting the tuples to be deleted.  
A) By specifying all tuples in the relation to be deleted without any condition  
B) By using a WHERE clause to select the specific tuples to be removed  
C) By modifying attribute values of one or more selected tuples  
D) By creating a new table based on the specified conditions  
Answer: B) By using a WHERE clause to select the specific tuples to be removed  
  
Level: 3 (Apply)  
Question: Solve the following problem: Delete all employees who work in department 4 from the EMPLOYEE table.  
A) DELETE FROM EMPLOYEE WHERE Dno = 5  
B) DELETE FROM EMPLOYEE WHERE Dno != 4  
C) UPDATE EMPLOYEE SET Dno = 4 WHERE Dno = 4  
D) INSERT INTO EMPLOYEE VALUES (NULL, NULL, 4, NULL, NULL)  
Answer: A) DELETE FROM EMPLOYEE WHERE Dno = 4  
  
Level: 4 (Analyze)  
Question: Compare the effect of running 'DELETE FROM EMPLOYEE' and 'DROP TABLE EMPLOYEE' on a database.  
A) Both commands delete all tuples from the relation, but only DROP TABLE removes the table definition  
B) Both commands remove the table definition, but only DELETE leaves an empty table in the database  
C) Only DELETE leaves an empty table in the database, while DROP TABLE removes the table definition and any associated constraints  
D) Both commands remove the table definition and any associated constraints, but only DELETE leaves an empty table in the database  
Answer: C) Only DELETE leaves an empty table in the database, while DROP TABLE removes the table definition and any associated constraints  
  
Level: 5 (Evaluate)  
Question: Justify whether it is better to use SET NULL or CASCADE in case of EMPSUPERFK constraint ON DELETE.  
A) It is better to use SET NULL because it avoids deleting the supervisor's record if an employee is deleted  
B) It is better to use CASCADE because it ensures the consistency of data by deleting both the employee and the supervisor records if required  
C) Neither option is preferable as it depends on specific use cases and data relationships  
D) SET NULL should be used for foreign key references while CASCADE for primary key references  
Answer: B) It is better to use CASCADE because it ensures the consistency of data by deleting both the employee and the supervisor records if required  
  
Level: 6 (Create)  
Question: Generate SQL statements to create a table EMPLOYEE\_BACKUP with the same structure as the EMPLOYEE table.  
A) CREATE TABLE EMPLOYEE\_BACKUP AS SELECT \* FROM EMPLOYEE  
B) INSERT INTO EMPLOYEE\_BACKUP VALUES (SELECT \* FROM EMPLOYEE)  
C) CREATE TABLE EMPLOYEE\_BACKUP LIKE EMPLOYEE;  
D) COPY EMPLOYEE TO EMPLOYEE\_BACKUP  
Answer: C) CREATE TABLE EMPLOYEE\_BACKUP LIKE EMPLOYEE;

* Question: Create six multiple choice question and answer of the question with the Dependency preservation concept

Response: LEVEL: Understand (Level 2)  
Question: What does the term "Dependency preservation" refer to in the context of a database decomposition?  
A) The process of adding dependencies to a database.  
B) The ability of a decomposition to maintain all existing functional dependencies.  
C) The act of removing dependencies from a database.  
D) The creation of new databases based on existing ones.  
Answer: B) The ability of a decomposition to maintain all existing functional dependencies. (PAGE SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, page 527)  
  
LEVEL: Analyze (Level 4)  
Question: Why is the dependency preservation property important for a decomposition?  
A) It ensures that the database design projects can be attempted with ease.  
B) It helps in maintaining the integrity of the data in the database.  
C) It allows for more efficient querying and indexing of the data.  
D) All of the above.  
Answer: D) All of the above. (PAGE SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, page 527)  
  
LEVEL: Remember (Level 1)  
Question: What happens to a functional dependency when it is lost during a decomposition?  
A) It becomes redundant and can be removed from the database.  
B) It cannot be checked or maintained in the decomposed relations.  
C) It becomes stronger and more complex.  
D) It becomes weaker and easier to maintain.  
Answer: B) It cannot be checked or maintained in the decomposed relations. (PAGE SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, page 527)  
  
LEVEL: Evaluate (Level 5)  
Question: Analyze an example of a decomposition that does not preserve dependencies. Justify your answer.  
A) The decomposition in Figure 14.13(a), where the functional dependency FD2 is lost when LOTS1A is decomposed into {LOTS1AX, LOTS1AY}.  
B) The decomposition in Figure 14.14, where no functional dependencies are lost during decomposition.  
C) The decomposition shown in Query 5, where the number of dependents for each employee is counted and selected based on a condition.  
D) None of the above decompositions lose functional dependencies.  
Answer: A) The decomposition in Figure 14.13(a), where the functional dependency FD2 is lost when LOTS1A is decomposed into {LOTS1AX, LOTS1AY}. (PAGE SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, page 527)  
  
LEVEL: Create (Level 6)  
Question: Develop an example of a decomposition that preserves dependencies based on the context provided.  
A) Decompose a table EMPLOYEE into two tables, one for employees with only one dependent and another for employees with more than one dependent, ensuring that all functional dependencies are maintained.  
B) Decompose a table ORDERS into tables for each order status while preserving all functional dependencies between the tables.  
C) Create a database schema with multiple entities and relationships, then decompose it into normalized forms ensuring that all dependencies are preserved.  
D) Decompose a table PRODUCTS into tables for each product category while maintaining all existing functional dependencies among the tables.  
Answer: All of the above examples could be developed based on the context provided. However, the specific implementation would require more detailed information about the functional dependencies and relationships in the given database schema. (PAGE SOURCE: Multiple sources, as questions involve combining information from multiple documents.)

* Question: Create six multiple choice question and answer of the question with the Difference concept

Response: LEVEL: Understand (Level 2)  
Question: What is the meaning of the term "interval" in the context of data types?  
A) A specific value  
B) A range of values  
C) A type of function  
D) A collection of data elements  
Answer: B) A range of values  
  
LEVEL: Analyze (Level 4)  
Question: Compare and contrast "between" operator and the "interval" concept in terms of data comparison.  
A) Between is a specific value, while interval is a range of values  
B) Interval is a specific value, while between is a range of values  
C) Both "between" and interval represent ranges of values  
D) Neither "between" nor interval represents a range of values  
Answer: C) Both "between" and interval represent ranges of values  
  
LEVEL: Remember (Level 1)  
Question: Define the concept of "interval value".  
A) A single value representing an instant in time or space  
B) An operation to find the difference between two data types  
C) The result of finding the difference between two date, time, or timestamp values  
D) A range of values representing a period or span  
Answer: D) A range of values representing a period or span  
  
LEVEL: Evaluate (Level 5)  
Question: Determine whether the statement "An interval value is the same as the 'between' operator" is correct.  
A) True  
B) False  
Answer: B) False  
  
LEVEL: Create (Level 6)  
Question: Generate an example using the concept of interval and the 'BETWEEN' operator in a SQL query.  
A) SELECT \* FROM table\_name WHERE time BETWEEN '2022-01-01 00:00:00' AND '2022-01-31 23:59:59';  
B) INSERT INTO table\_name (interval\_column) VALUES ('2 days');  
C) UPDATE table\_name SET interval\_column = interval\_column + '1 week';  
D) SELECT \* FROM table\_name WHERE temperature BETWEEN 30 AND 40;  
Answer: A) SELECT \* FROM table\_name WHERE time BETWEEN '2022-01-01 00:00:00' AND '2022-01-31 23:59:59';  
  
LEVEL: Apply (Level 3)  
Question: Solve the following problem using the concept of interval and the 'BETWEEN' operator in SQL. Find all records with a date between January 1, 2022 and February 28, 2022 from the table named "Events".  
A) SELECT \* FROM Events WHERE date\_column = 'January 1, 2022 - February 28, 2022';  
B) SELECT \* FROM Events WHERE date\_column BETWEEN 'January 1, 2022' AND 'February 28, 2022';  
C) SELECT \* FROM Events WHERE date\_column >= 'January 1, 2022' AND date\_column <= 'February 28, 2022';  
D) SELECT \* FROM Events WHERE date\_column IS BETWEEN January 1, 2022 AND February 28, 2022;  
Answer: C) SELECT \* FROM Events WHERE date\_column >= 'January 1, 2022' AND date\_column <= 'February 28, 2022';

* Question: Create six multiple choice question and answer of the question with the Discretionary access control (DAC) concept

Response: Level: Remember  
Question: Define Discretionary Access Control (DAC)?  
A) A type of access control that does not allow any illegal flow of information  
B) A type of access control that enforces multilevel security and classifies users and data values into security classes  
C) A type of access control that ensures a high degree of protection suitable for military and high-security applications  
D) A type of access control that makes sure the user is legally authorized to carry on an operation on the schema  
Answer: A) A type of access control that does not allow any illegal flow of information  
  
Level: Understand  
Question: Explain the main drawback of DAC models?  
A) They require a strict classification of subjects and objects into security levels  
B) They are too rigid in that they prevent any illegal flow of information  
C) They enforce multilevel security and classify users and data values into security classes  
D) They are suitable for military and high-security types of applications  
Answer: B) They are too rigid in that they prevent any illegal flow of information  
  
Level: Apply  
Question: Solve: If a system uses DAC, what does it imply about the control on how information is propagated and used once it has been accessed?  
A) There is strict control over how information is propagated and used  
B) There is no control over how information is propagated and used  
C) Information can only be used within its security class  
D) Information can be used by any authorized user regardless of the security level  
Answer: B) There is no control over how information is propagated and used  
  
Level: Analyze  
Question: Compare DAC with Mandatory Access Control (MAC). What is a key difference between them?  
A) DAC requires a strict classification of subjects and objects into security levels, while MAC does not  
B) DAC prevents any illegal flow of information, while MAC allows for some illegal flows  
C) DAC is suitable for military and high-security types of applications, while MAC is not  
D) DAC enforces multilevel security, while MAC does not  
Answer: A) DAC requires a strict classification of subjects and objects into security levels, while MAC does not  
  
Level: Evaluate  
Question: Justify why DAC might be more suitable for some applications compared to MAC?  
A) Because it is less rigid and allows for more flexibility in controlling access to data  
B) Because it prevents any illegal flow of information, making it more secure than MAC  
C) Because it requires a strict classification of subjects and objects into security levels, which can be time-consuming and complex  
D) Because DAC enforces multilevel security, while MAC does not  
Answer: A) Because it is less rigid and allows for more flexibility in controlling access to data  
  
Level: Create  
Question: Generate an example of a situation where DAC would be most suitable.  
A) A banking application where customers need to access their account information  
B) A military database containing classified documents  
C) An e-commerce website where only authorized employees can access sensitive customer data  
D) A medical research database where researchers need to collaborate and share data  
Answer: A) A banking application where customers need to access their account information

* Question: Create six multiple choice question and answer of the question with the Data Manipulation language concept

Response: Level: Remember  
Question: What does DML stand for in the context of Database Management Systems (DBMS)?  
A) Data Manipulation Kit  
B) Database Management Language  
C) Data Modification Language  
D) Database Maintenance Language  
Answer: C) Data Modification Language (Level: 1, Page Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf)  
  
Level: Remember  
Question: Which language provided by DBMS is used for retrieval, insertion, deletion, and modification of data?  
A) Data Definition Language (DDL)  
B) Data Query Language (DQL)  
C) Data Manipulation Language (DML)  
D) Data Access Language (DAL)  
Answer: C) Data Manipulation Language (Level: 1, Page Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf)  
  
Level: Understand  
Question: Explain how DML is used in DBMS for manipulating data.  
A) By providing a set of operations that allow users to retrieve, insert, delete, and modify data in the database.  
B) By defining the physical structure of the database.  
C) By generating various types of objects such as connection objects to a particular database, query objects, and query result objects.  
D) By converting the database language into a full-fledged programming language with loops and conditional statements.  
Answer: A) By providing a set of operations that allow users to retrieve, insert, delete, and modify data in the database. (Level: 2, Page Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf)  
  
Level: Analyze  
Question: Compare DML and SQL in terms of their primary purpose and usage.  
A) DML is a comprehensive integrated language used for conceptual schema definition, view definition, and data manipulation, while SQL is specifically designed for querying databases.  
B) DML is used for defining physical storage structures to fine-tune the performance of the database system, while SQL is used for retrieval, insertion, deletion, and modification of data.  
C) DML and SQL are identical and can be used interchangeably in any context related to databases.  
D) Both DML and SQL are programming languages that allow users to interact with a database but serve different purposes depending on the application and context.  
Answer: D) Both DML and SQL are programming languages that allow users to interact with a database but serve different purposes depending on the application and context. (Level: 4, Page Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf)  
  
Level: Evaluate  
Question: Determine whether the statement "DML is used to define physical storage structures" is correct based on the given context.  
A) True  
B) False  
Answer: B) False (Level: 5, Page Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf)  
  
Level: Create  
Question: Generate a question that asks for an example of a comprehensive database language that includes constructs for conceptual schema definition, view definition, and data manipulation.  
A) What is an example of a comprehensive integrated language used for defining physical storage structures to fine-tune the performance of a database system?  
B) Give an example of a comprehensive integrated language that includes constructs for conceptual schema definition, view definition, and data manipulation.  
Answer: B) Give an example of a comprehensive integrated language that includes constructs for conceptual schema definition, view definition, and data manipulation. (Level: 6, Page Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf)

* Question: Create six multiple choice question and answer of the question with the Domain concept

Response: Level: Remember (Define)  
Page Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf - Page 164  
  
Question: What is a domain in the context of databases?  
A) A set of computer programs used for data retrieval  
B) The total number of pages in a document  
C) A collection of related variables and their values  
D) A specific database management system  
Answer: C) A collection of related variables and their values  
  
Level: Understand (Explain)  
Page Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf - Page 164  
  
Question: Explain the concept of a domain in databases with examples.  
A) Domains are used to store and manipulate data; examples include phone numbers, employee ages, and grade point averages.  
B) Domains are used to specify the format of the data, such as dates or decimal numbers.  
C) Domains are used to categorize different types of data, like text and images.  
D) Domains are used to manage user permissions for accessing data.  
Answer: A) Domains are used to store and manipulate data; examples include phone numbers, employee ages, and grade point averages.  
  
Level: Analyze (Compare)  
Page Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf - Page 164  
  
Question: Compare the Usa\_phone\_numbers, Local\_phone\_numbers, and Social\_security\_numbers domains provided in the document.  
A) They all refer to unique identifiers for individuals in the United States.  
B) They are all ten-digit phone numbers, but Usa\_phone\_numbers is valid nationwide while Local\_phone\_numbers is limited to a specific area code.  
C) Social\_security\_numbers and Names are examples of character strings representing people's identities, while Usa\_phone\_numbers and Local\_phone\_numbers are numerical values.  
D) They all have the same number of digits and serve the same purpose in a database system.  
Answer: C) Social\_security\_numbers and Names are examples of character strings representing people's identities, while Usa\_phone\_numbers and Local\_phone\_numbers are numerical values.  
  
Level: Evaluate (Justify)  
Page Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf - Page 164  
  
Question: Determine whether the given domain, "Email\_addresses", would be a valid example of a database domain based on the provided context. Justify your answer.  
A) Yes, because it refers to a set of unique email addresses that can be used for communication purposes.  
B) No, because it does not fit within any of the previously mentioned examples in the document.  
C) It is unclear without more context about the specific format and validation rules for Email\_addresses.  
Answer: A) Yes, because it refers to a set of unique email addresses that can be used for communication purposes.  
  
Level: Create (Generate)  
Page Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf - Page 164  
  
Question: Generate an example domain that represents a person's marital status.  
A) Married\_statuses. Possible values include "Single", "Married", "Divorced", and "Widowed".  
B) Relationship\_statuses. Possible values include "Friend", "Family member", "Colleague", and "Spouse".  
C) Gender. Possible values include "Male" and "Female".  
D) Age\_range. Possible values include "Under 18", "18-25", "26-35", and "Over 35".  
Answer: A) Married\_statuses. Possible values include "Single", "Married", "Divorced", and "Widowed".

* Question: Create six multiple choice question and answer of the question with the DROP TABLE command concept

Response: Question Level: Remember (1)  
Question: Define the DROP TABLE command in SQL.  
A) A command used to drop a whole schema from the database if it is no longer needed.  
B) A command used to create a new table in the database.  
C) A command used to delete all records in a specific table and remove its definition from the catalog.  
D) A command used to add constraints to a table in SQL.  
Answer: C) A command used to delete all records in a specific table and remove its definition from the catalog.  
LEVEL: 1  
PAGE SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf - page 246, 247  
  
Question Level: Understand (2)  
Question: Explain how to drop a table using the DROP TABLE command with the CASCADE option.  
A) The command drops the table only if it is not referenced in any constraints or views or by any other elements.  
B) The command removes all the records in the table and its definition, and also removes all the constraints, views, and other elements that reference the table being dropped from the schema, along with the table itself.  
C) The command drops the table only if it has no elements in it; otherwise, the DROP command will not be executed.  
D) The command drops a named schema element like tables, domains, types, or constraints without the CASCADE option.  
Answer: B) The command removes all the records in the table and its definition, and also removes all the constraints, views, and other elements that reference the table being dropped from the schema, along with the table itself.  
LEVEL: 2  
PAGE SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf - page 246, 247  
  
Question Level: Apply (3)  
Question: Solve for the SQL command to drop the DEPENDENT table from the COMPANY database schema using the CASCADE option.  
A) DROP SCHEMA COMPANY RESTRICT;  
B) DROP TABLE DEPENDENT RESTRICT;  
C) DROP TABLE DEPENDENT CASCADE;  
D) DROP TABLE COMPANY CASCADE;  
Answer: C) DROP TABLE DEPENDENT CASCADE;  
LEVEL: 3  
PAGE SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf - page 246, 247  
  
Question Level: Analyze (4)  
Question: Compare the effects of using the CASCADE option versus the RESTRICT option when dropping a table with foreign key constraints in SQL.  
A) When using CASCADE, all constraints and views that reference the column are dropped automatically from the schema, along with the column. With RESTRICT, the command is successful only if no views or constraints (or other schema elements) reference the column.  
B) When using CASCADE, the table can be dropped without any restrictions, regardless of whether it is referenced by foreign key constraints or not. With RESTRICT, the table cannot be dropped unless it is completely empty.  
C) Both options have no difference in terms of dropping tables with foreign key constraints in SQL.  
D) When using CASCADE, the table can be dropped only if it is referenced in any constraints (for example, by foreign key definitions in another relation) or views (see Section 7.3) or by any other elements. With RESTRICT, the table can be dropped without any restrictions, regardless of whether it is referenced by foreign key constraints or not.  
Answer: A) When using CASCADE, all constraints and views that reference the column are dropped automatically from the schema, along with the column. With RESTRICT, the command is successful only if no views or constraints (or other schema elements) reference the column.  
LEVEL: 4  
PAGE SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf - page 246, 247  
  
Question Level: Evaluate (5)  
Question: Determine why we cannot use the NOT NULL constraint in a table when no default clause is specified and the DROP TABLE command is executed without the CASCADE option.  
A) Because the NOT NULL constraint requires that all tuples of the relation have non-NULL values for the attribute, and since the DROP TABLE command removes all records from the table, it cannot be applied in this case.  
B) Because the NOT NULL constraint is not allowed when using the RESTRICT option with the DROP TABLE command.  
C) Because the DROP TABLE command without the CASCADE option does not delete all records in the table but only removes the table definition from the catalog, the NOT NULL constraint can still be applied.  
D) Because the NOT NULL constraint is a type of foreign key constraint and cannot be dropped using the RESTRICT option with the DROP TABLE command.  
Answer: A) Because the NOT NULL constraint requires that all tuples of the relation have non-NULL values for the attribute, and since the DROP TABLE command removes all records from the table, it cannot be applied in this case.  
LEVEL: 5  
PAGE SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf - page 247  
  
Question Level: Create (6)  
Question: Generate an SQL command to remove the attribute Address from the EMPLOYEE base table using the CASCADE option to drop any constraints and views that reference the column, along with the column itself.  
A) DROP CONSTRAINT Address ON EMPLOYEE CASCADE;  
B) DROP COLUMN Address FROM EMPLOYEE RESTRICT;  
C) ALTER TABLE EMPLOYEE DROP COLUMN Address CASCADE;  
D) DELETE FROM EMPLOYEE WHERE Address IS NOT NULL;  
Answer: C) ALTER TABLE EMPLOYEE DROP COLUMN Address CASCADE;  
LEVEL: 6  
PAGE SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf - page 247

* Question: Create six multiple choice question and answer of the question with the Enhanced Entity-Relationship concept

Response: Level: Remember  
Question: Define a category in the context of the Enhanced Entity-Relationship (EER) model.  
A) A specific type of association  
B) A group of related classes  
C) An artificial key used for a regular entity type  
D) A weak entity type without a primary key  
Answer: B) A group of related classes  
LEVEL: 1 - Remember  
SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf page 149  
  
Level: Understand  
Question: Explain the difference between a shared subclass and a category in EER model.  
A) A shared subclass is a specialization of a superclass while a category is not  
B) A category is a group of related classes, while a shared subclass can be a subset of another class  
C) A category has its own attributes and relationships, whereas a shared subclass shares the same attributes and relationships as its parent class  
D) A shared subclass can inherit attributes from multiple superclasses, while a category cannot  
Answer: B) A category is a group of related classes, while a shared subclass can be a subset of another class  
LEVEL: 2 - Understand  
SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf page 149  
  
Level: Apply  
Question: Solve the problem by modifying the diagram in Lab Exercise 3.31 to classify COURSES as either UNDERGRAD\_COURSES or GRAD\_COURSES and INSTRUCTORS as either JUNIOR\_PROFESSORS or SENIOR\_PROFESSORS, including appropriate attributes for these new entity types.  
A) Add the new entity types to the diagram and assign appropriate attributes such as course level (undergraduate or graduate) and instructor rank (junior or senior)  
B) Modify the existing classes to include a new attribute representing course level or instructor rank  
C) Create a new relationship between the COURSES, INSTRUCTORS, and their subclasses to represent that junior instructors teach undergraduate courses whereas senior instructors teach graduate courses  
D) Remove the existing relationships from the diagram and replace them with new ones between the subclasses of COURSES and INSTRUCTORS  
Answer: A) Add the new entity types to the diagram and assign appropriate attributes such as course level (undergraduate or graduate) and instructor rank (junior or senior)  
LEVEL: 3 - Apply  
SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf page 159  
  
Level: Analyze  
Question: Compare and contrast the notation for EER schema diagrams and UML class diagrams by comparing how common concepts are represented in each.  
A) EER schema diagrams use more geometric shapes to represent entities, associations, and relationships compared to UML class diagrams  
B) UML class diagrams use more text-based notations for classes, attributes, and operations compared to EER schema diagrams  
C) Both EER schema diagrams and UML class diagrams use similar symbols to represent common concepts such as entities, associations, and relationships but have differences in their level of detail and expressiveness  
D) UML class diagrams are more complex than EER schema diagrams and require a greater understanding of Object-Oriented Programming (OOP) concepts  
Answer: C) Both EER schema diagrams and UML class diagrams use similar symbols to represent common concepts such as entities, associations, and relationships but have differences in their level of detail and expressiveness  
LEVEL: 4 - Analyze  
SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf page 146, 160  
  
Level: Evaluate  
Question: Justify why a ternary relationship in the EER model cannot be directly represented using binary relationships without introducing weak entity types or artificial keys.  
A) Because the EER model does not support ternary relationships  
B) Ternary relationships require three identifying relationships, which cannot be achieved with binary relationships alone  
C) Ternary relationships can be represented using binary relationships, but it is more efficient to introduce weak entity types or artificial keys for better data normalization  
D) All of the above  
Answer: D) All of the above  
LEVEL: 5 - Evaluate  
SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf page 90, 103  
  
Level: Create  
Question: Generate an example for a ternary relationship using weak entity types in the EER model to represent the SUPPLY relationship between SUPPLIER, PART, and PROJECT.  
A) Represent SUPPLIER as a regular entity type with attributes such as supplier\_id and name. Create a weak entity type SUPPLY with attributes such as supply\_id, part\_id, and project\_id to represent the ternary relationship between SUPPLIER, PART, and PROJECT  
B) Create three binary relationships between SUPPLIER, PART, and PROJECT using artificial keys for the supply entity type  
C) Remove the PART and PROJECT entities from the EER diagram and replace them with a single entity type called PART\_PROJECT with attributes representing both part and project details  
D) Introduce a new attribute Supply\_id for the SUPPLIER entity type, converting it into a regular entity type to represent the ternary relationship  
Answer: A) Represent SUPPLIER as a regular entity type with attributes such as supplier\_id and name. Create a weak entity type SUPPLY with attributes such as supply\_id, part\_id, and project\_id to represent the ternary relationship between SUPPLIER, PART, and PROJECT  
LEVEL: 6 - Create  
SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf page 90, 103

* Question: Create six multiple choice question and answer of the question with the Entity concept

Response: Level: Remember  
Question: Define an entity type (Fundamentals of Database Systems Seventh Edition, Page 82)  
A) A group of records in a database  
B) A collection of all employee entities in the database  
C) A high-level conceptual data model  
D) A rectangular box enclosing the entity type name in ER diagrams  
Answer: D) A rectangular box enclosing the entity type name in ER diagrams  
  
Level: Understand  
Question: Explain what an entity set or entity collection is (Fundamentals of Database Systems Seventh Edition, Page 82)  
A) The database at any point in time  
B) A group of records in a database  
C) A type of entity  
D) The current collection of all employee entities in the database  
Answer: A) The database at any point in time  
  
Level: Apply  
Question: Solve for the key attribute of the COMPANY entity type in Figure 3.6 (Fundamentals of Database Systems Seventh Edition, Page not mentioned but context implies it is on page 82)  
A) Name  
B) Social Security Number (Ssn)  
C) Address  
D) Phone number  
Answer: A) Name  
  
Level: Analyze  
Question: Compare the difference between an entity type and an entity set (Fundamentals of Database Systems Seventh Edition, Page 82)  
A) An entity type is a schema or intension for a set of entities that share the same structure. An entity set is the collection of entities of a particular entity type.  
B) An entity type is a type of entity while an entity set is the database at any point in time.  
C) An entity type describes the extension of the entity type, while an entity set describes the schema or intension for a set of entities that share the same structure.  
D) An entity type is the current collection of all employee entities in the database, while an entity set is a group of records in a database.  
Answer: A) An entity type is a schema or intension for a set of entities that share the same structure. An entity set is the collection of entities of a particular entity type.  
  
Level: Evaluate  
Question: Justify why the Name attribute is a key of the COMPANY entity type in Figure 3.6 (Fundamentals of Database Systems Seventh Edition, Page 82)  
A) Because no two companies are allowed to have the same name  
B) Because the Name attribute is a required attribute for every company  
C) Because the Name attribute is unique within the database  
D) Because the Name attribute is the only attribute in the COMPANY entity type  
Answer: A) Because no two companies are allowed to have the same name  
  
Level: Create  
Question: Generate an example of a multivalued attribute displayed in double ovals in ER diagrams (Fundamentals of Database Systems Seventh Edition, Page 82)  
A) EMAIL [John@example.com, john1234567890@gmail.com]  
B) ADDRESS [New York, NY, USA, 123 Main Street]  
C) PHONE [555-1234, 555-5678]  
D) NAME [John Doe, John Smith]  
Answer: A) EMAIL [John@example.com, john1234567890@gmail.com]

* Question: Create six multiple choice question and answer of the question with the Entity-Relationship Model concept
* Question: Create six multiple choice question and answer of the question with the Equality concept

Response: Level: Remember (1)  
Question: What does EXISTS return in a SQL query context?  
A) FALSE if no tuples are found  
B) TRUE if at least one tuple is found  
C) A tuple that matches the query  
D) The number of tuples that match the query  
Answer: B) TRUE if at least one tuple is found (SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, page 226)  
  
Level: Understand (2)  
Question: How does NOT EXISTS work in SQL queries?  
A) It returns TRUE if no tuples are found in the nested query  
B) It returns FALSE if at least one tuple is found in the nested query  
C) It retrieves all DEPENDENT tuples that don't match the outer query's EMPLOYEE tuple  
D) It compares the number of tuples in both queries and returns the lesser value  
Answer: A) It returns TRUE if no tuples are found in the nested query (SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, page 226)  
  
Level: Apply (3)  
Question: Given Query 16B, which EMPLOYEE tuples would be selected if there exists at least one DEPENDENT tuple with the same Essn, Sex, and Dependent\_name?  
A) All EMPLOYEE tuples where EXISTS returns TRUE  
B) Only those EMPLOYEE tuples with no matching DEPENDENT tuples  
C) The first EMPLOYEE tuple that matches a DEPENDENT tuple  
D) The EMPLOYEE tuple with the least number of matching DEPENDENT tuples  
Answer: A) All EMPLOYEE tuples where EXISTS returns TRUE (SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, page 226)  
  
Level: Analyze (4)  
Question: How do EXISTS and NOT EXISTS affect the performance of a SQL query?  
A) They both have a positive impact on the performance by reducing the number of comparisons needed  
B) They both have a negative impact on the performance due to increased complexity in the query structure  
C) EXISTS has a positive impact while NOT EXISTS has a negative impact  
D) Not EXISTS has a positive impact while EXISTS has a negative impact  
Answer: B) They both have a negative impact on the performance due to increased complexity in the query structure (SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, page 226)  
  
Level: Evaluate (5)  
Question: In Query 16B, what should we expect if there are no matching DEPENDENT tuples for a given EMPLOYEE tuple?  
A) The query will not return any results  
B) The query will return an error due to the EXISTS clause  
C) The query will return FALSE for that particular EMPLOYEE tuple  
D) The query will continue executing but with no useful information for that EMPLOYEE tuple  
Answer: A) The query will not return any results (SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, page 226)  
  
Level: Create (6)  
Question: Design a SQL query using EXISTS to find all EMPLOYEE tuples who have at least one DEPENDENT with the same name and sex but a different Essn from themselves.  
A) SELECT E.Fname, E.Lname FROM EMPLOYEE AS E WHERE NOT EXISTS (SELECT \* FROM DEPENDENT AS D WHERE E.Essn = D.Essn AND E.Sex = D.Sex AND E.Fname = D.Dependent\_name)  
B) SELECT E.Fname, E.Lname FROM EMPLOYEE AS E WHERE EXISTS (SELECT \* FROM DEPENDENT AS D WHERE E.Essn <> D.Essn AND E.Sex = D.Sex AND E.Fname = D.Dependent\_name)  
C) SELECT E.Fname, E.Lname FROM EMPLOYEE AS E WHERE EXISTS (SELECT \* FROM DEPENDENT AS D WHERE E.Ssn = D.Essn AND E.Sex <> D.Sex AND E.Fname = D.Dependent\_name)  
D) SELECT E.Fname, E.Lname FROM EMPLOYEE AS E WHERE EXISTS (SELECT \* FROM DEPENDENT AS D WHERE E.Essn = D.Essn AND E.Sex = D.Sex AND E.Fname <> D.Dependent\_name)  
Answer: B) SELECT E.Fname, E.Lname FROM EMPLOYEE AS E WHERE EXISTS (SELECT \* FROM DEPENDENT AS D WHERE E.Essn <> D.Essn AND E.Sex = D.Sex AND E.Fname = D.Dependent\_name) (SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, page 226)

* Question: Create six multiple choice question and answer of the question with the Equivalent concept

Response: Level: Remember  
Question: Define named entity recognition (NER) in the context of question answering systems?  
A) A technique used for understanding the structure of a document  
B) The process of identifying and categorizing key information from a question  
C) A system that allows a computer to answer complex questions  
D) An algorithm for parsing and analyzing natural language queries  
Answer: B) The process of identifying and categorizing key information from a question  
  
Level: Understand  
Question: Explain the role of focus extraction in question answering systems?  
A) It is responsible for identifying the main topic or focus of a question  
B) It extracts irrelevant details from questions to improve query efficiency  
C) It generates candidate answers by matching regular expression templates with lexical chunks  
D) It applies ontological inference to answer questions based on existing knowledge bases  
Answer: A) It is responsible for identifying the main topic or focus of a question  
  
Level: Apply  
Question: Solve the following factoid question using surface pattern matching technique: "Which book is a tragic love story by Shakespeare?"  
A) Romeo and Juliet  
B) Hamlet  
C) Othello  
D) Macbeth  
Answer: A) Romeo and Juliet  
  
Level: Analyze  
Question: Compare the differences between factoid questions and other types of questions in question answering systems?  
A) Factoid questions pinpoint the right phrase in a document or database, while other types do not  
B) Other types of questions are more complex and require hybrid answering strategies  
C) Factoid questions are easier to answer than other types due to their straightforward nature  
D) Both factoid questions and other types rely on the same answering strategies  
Answer: A) Factoid questions pinpoint the right phrase in a document or database, while other types do not  
  
Level: Evaluate  
Question: Determine whether the following statement is true or false: Question answering techniques involve knowledge engineering from large unstructured corpora such as web document collections and structured databases.  
A) True  
B) False  
Answer: A) True  
  
Level: Create  
Question: Generate a new factoid question that can be answered using surface pattern matching technique in the context of the document: "Which city was Elvis Presley born in?"  
Answer: Which city was Elvis Presley born in? (Surface pattern matching would replace the phrase "which city" with the city name found in the document)

* Question: Create six multiple choice question and answer of the question with the EXCEPT command

Response: LEVEL: Remember  
Question: Define the EXCEPT command in SQL context.  
A) A command used for creating a new table  
B) A keyword used to combine two queries together  
C) A keyword used to join tables in SQL  
D) A command used as set difference operator in SQL to remove duplicate values from query results.  
Answer: D) A command used as set difference operator in SQL to remove duplicate values from query results.  
  
LEVEL: Understand  
Question: Explain the EXCEPT command with an example.  
A) EXCEPT is used to combine two queries together, for instance, SELECT \* FROM Table1 UNION ALL SELECT \* FROM Table2 EXCEPT SELECT \* FROM Table3.  
B) EXCEPT is used to join tables in SQL, for instance, SELECT \* FROM Table1 JOIN Table2 ON Table1.id = Table2.id EXCEPT SELECT \* FROM Table4.  
C) EXCEPT is a keyword used to remove duplicate values from query results, for example: SELECT DISTINCT column\_name FROM Table1 EXCEPT SELECT DISTINCT column\_name FROM Table2.  
D) EXCEPT is a command used to create assertions in SQL.  
Answer: C) EXCEPT is a keyword used to remove duplicate values from query results, for example: SELECT DISTINCT column\_name FROM Table1 EXCEPT SELECT DISTINCT column\_name FROM Table2.  
  
LEVEL: Apply  
Question: Solve the given SQL query using the EXCEPT command to find the difference between two sets of data.  
A) SELECT \* FROM Employees EXCEPT SELECT \* FROM Departments WHERE DepartmentId = 5;  
B) SELECT \* FROM Employees INTERSECT ALL SELECT \* FROM Departments WHERE DepartmentId = 5 EXCEPT SELECT \* FROM Employees;  
C) SELECT \* FROM Employees INNER JOIN Departments ON Employees.DepartmentId = Departments.id EXCEPT SELECT \* FROM Employees WHERE DepartmentId IS NULL;  
D) SELECT \* FROM Employees UNION ALL SELECT \* FROM Departments WHERE DepartmentId IS NOT 5;  
Answer: A) SELECT \* FROM Employees EXCEPT SELECT \* FROM Departments WHERE DepartmentId = 5;  
  
LEVEL: Analyze  
Question: Compare the use of EXCEPT and INTERSECT in SQL.  
A) Both EXCEPT and INTERSECT are used to compare two sets, but they return opposite results. The INTERSECT command returns the common elements between two sets while the EXCEPT command returns the difference between them.  
B) Both EXCEPT and INTERSECT are used to combine two queries together. The INTERSECT command returns the union of both queries while the EXCEPT command removes duplicate values from the combined result set.  
C) Both EXCEPT and INTERSECT are used to join tables in SQL. The INNER JOIN command combines rows from two or more tables when they have matching values, whereas the OUTER JOIN command returns all records when there is a match in at least one table but EXCEPT and INTERSECT don't work with tables.  
D) Both EXCEPT and INTERSECT are used to create assertions in SQL.  
Answer: A) Both EXCEPT and INTERSECT are used to compare two sets, but they return opposite results. The INTERSECT command returns the common elements between two sets while the EXCEPT command returns the difference between them.  
  
LEVEL: Evaluate  
Question: Determine whether the following SQL query uses the EXCEPT or INTERSECT command.  
A) SELECT \* FROM Employees WHERE DepartmentId NOT IN (SELECT DepartmentId FROM Departments WHERE DepartmentName = 'Sales');  
B) SELECT \* FROM Employees EXCEPT SELECT \* FROM Departments WHERE DepartmentId = 5;  
C) SELECT \* FROM Employees INNER JOIN Departments ON Employees.DepartmentId = Departments.id EXCEPT SELECT \* FROM Employees WHERE DepartmentId IS NULL;  
D) SELECT \* FROM Employees INTERSECT ALL SELECT \* FROM Departments WHERE DepartmentId IS NOT 5;  
Answer: A) The given SQL query does not use the EXCEPT or INTERSECT command. Instead, it uses the NOT IN operator to find employees that are not in the 'Sales' department.  
  
LEVEL: Create  
Question: Generate a SQL query using the EXCEPT command to find all projects controlled by departments other than 5 where an employee works on no such project.  
A) SELECT \* FROM Projects WHERE DepartmentId NOT IN (SELECT DepartmentId FROM Departments WHERE DepartmentId = 5) EXCEPT SELECT \* FROM Employee\_Project WHERE EmployeeId = :employee\_id;  
B) SELECT \* FROM Departments AS D LEFT JOIN Projects AS P ON D.DepartmentId = P.DepartmentId WHERE D.DepartmentId != 5 AND NOT EXISTS (SELECT \* FROM Employee\_Project WHERE EmployeeId = :employee\_id AND ProjectId = P.ProjectId);  
C) SELECT \* FROM Departments AS D RIGHT JOIN Projects AS P ON D.DepartmentId = P.DepartmentId WHERE D.DepartmentId != 5 AND NOT EXISTS (SELECT \* FROM Employee\_Project WHERE EmployeeId = :employee\_id AND ProjectId = P.ProjectId);  
D) SELECT \* FROM Projects AS P JOIN Departments AS D ON P.DepartmentId = D.DepartmentId WHERE D.DepartmentId != 5 EXCEPT SELECT \* FROM Employee\_Project WHERE EmployeeId = :employee\_id;  
Answer: B) SELECT \* FROM Departments AS D LEFT JOIN Projects AS P ON D.DepartmentId = P.DepartmentId WHERE D.DepartmentId != 5 AND NOT EXISTS (SELECT \* FROM Employee\_Project WHERE EmployeeId = :employee\_id AND ProjectId = P.ProjectId);

* Question: Create six multiple choice question and answer of the question with the EXISTS command

Response: Level: Remember  
Question: Define EXISTS in SQL (Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, Page 225)  
A) A Boolean function that returns the minimum value of a column  
B) A command used for creating assertions in SQL  
C) An operator used to check if a given relation is empty or not  
D) A query written with nested select-from-where blocks and using the = or IN comparison operators  
Answer: C) An operator used to check if a given relation is empty or not  
  
Level: Understand  
Question: Explain how EXISTS works in SQL (Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, Page 225)  
A) It returns the maximum value of a column  
B) It is used to check whether the result of a nested query contains at least one tuple or not  
C) It checks if a specific condition is true in a table  
D) It creates an assertion in SQL  
Answer: B) It is used to check whether the result of a nested query contains at least one tuple or not  
  
Level: Apply  
Question: Solve Query 16 using EXISTS (Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, Page 225)  
A) SELECT E.Fname, E.Lname FROM EMPLOYEE AS E WHERE EXISTS (SELECT \* FROM DEPENDENT AS D WHERE E.Ssn = D.Essn AND E.Sex = D.Sex AND E.Fname != D.Dependent\_name);  
B) SELECT E.Fname, E.Lname FROM EMPLOYEE AS E WHERE EXISTS (SELECT \* FROM DEPENDENT AS D WHERE E.Ssn = D.Essn AND E.Sex = D.Sex AND E.Fname = D.Dependent\_name);  
C) SELECT E.Fname, E.Lname FROM EMPLOYEE AS E WHERE EXISTS (SELECT \* FROM DEPENDENT AS D WHERE E.Ssn != D.Essn OR E.Sex != D.Sex OR E.Fname = D.Dependent\_name);  
D) SELECT E.Fname, E.Lname FROM EMPLOYEE AS E WHERE EXISTS (SELECT \* FROM DEPENDENT AS D WHERE E.Ssn = D.Essn AND E.Sex = D.Sex AND E.Fname != D.Dependent\_name);  
Answer: D) SELECT E.Fname, E.Lname FROM EMPLOYEE AS E WHERE EXISTS (SELECT \* FROM DEPENDENT AS D WHERE E.Ssn = D.Essn AND E.Sex = D.Sex AND E.Fname = D.Dependent\_name);  
  
Level: Analyze  
Question: Compare EXISTS and NOT EXISTS in SQL (Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, Page 225)  
A) Both EXISTS and NOT EXISTS are Boolean functions that return TRUE if the nested query result contains at least one tuple, or FALSE otherwise, but their behavior is opposite  
B) EXISTS checks whether the result of a nested query is empty or not while NOT EXISTS checks whether the result contains at least one tuple  
C) Both EXISTS and NOT EXISTS check if a specific condition is true in a table  
D) EXISTS returns TRUE if there is at least one tuple in the result of the nested query Q, and returns FALSE otherwise; while NOT EXISTS returns TRUE if there are no tuples in the result of nested query Q, and returns FALSE otherwise  
Answer: D) EXISTS returns TRUE if there is at least one tuple in the result of the nested query Q, and returns FALSE otherwise; while NOT EXISTS returns TRUE if there are no tuples in the result of nested query Q, and returns FALSE otherwise  
  
Level: Evaluate  
Question: Justify the use of EXISTS in Query 16 (Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, Page 225)  
A) It allows for a more efficient query due to fewer comparisons being needed  
B) It simplifies the structure of the SQL query  
C) It ensures that the EMPLOYEE and DEPENDENT tables are properly related  
D) It checks if the EMPLOYEE tuple has at least one dependent  
Answer: D) It checks if the EMPLOYEE tuple has at least one dependent  
  
Level: Create  
Question: Generate an alternative query to find employees without dependents using NOT EXISTS (Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, Page 225)  
A) SELECT Fname, Lname FROM EMPLOYEE WHERE NOT EXISTS (SELECT \* FROM DEPENDENT WHERE Ssn = Essn);  
B) SELECT Fname, Lname FROM EMPLOYEE WHERE EXISTS (SELECT \* FROM DEPENDENT WHERE Ssn != Essn);  
C) SELECT Fname, Lname FROM EMPLOYEE WHERE NOT EXISTS (SELECT \* FROM DEPENDENT WHERE E.Ssn = D.Essn AND E.Sex = D.Sex);  
D) SELECT Fname, Lname FROM EMPLOYEE WHERE NOT EXISTS (SELECT \* FROM DEPENDENT WHERE E.Ssn = D.Essn OR E.Sex != D.Sex);  
Answer: A) SELECT Fname, Lname FROM EMPLOYEE WHERE NOT EXISTS (SELECT \* FROM DEPENDENT WHERE Ssn = Essn);

* Question: Create six multiple choice question and answer of the question with the Foreign key concept

Response: Level: Remember  
Question: Define a foreign key in the context of database systems.  
A) A unique identifier for a row in a table  
B) A column that stores a value from another table  
C) A column that references a value in the same table  
D) A column that represents a relationship between tables  
Answer: D) A column that represents a relationship between tables  
  
Level: Understand  
Question: Explain how foreign keys are used to establish relationships between tables.  
A) Foreign keys are used to store values from another table in a single column.  
B) Foreign keys are used to identify the relationship type between two tables.  
C) Foreign keys are used to create separate relations for binary M:N relationships.  
D) Foreign keys are used to establish relationships between tables by referencing primary keys of other tables.  
Answer: D) Foreign keys are used to establish relationships between tables by referencing primary keys of other tables.  
  
Level: Apply  
Question: Solve the problem of dealing with foreign keys when a table (e.g., EMPLOYEE) references another table (e.g., DEPARTMENT) that hasn't been created yet.  
A) Leave out the foreign key constraints in the initial CREATE TABLE statement and add them later using the ALTER TABLE statement.  
B) Create a new relation for each binary M:N relationship type R, including primary keys of both participating tables as foreign keys.  
C) Use the relationship relation (cross-reference) option to create a separate relation for the foreign key.  
D) Remove the foreign key constraint from the initial CREATE TABLE statement and ignore it until the referenced table is created.  
Answer: A) Leave out the foreign key constraints in the initial CREATE TABLE statement and add them later using the ALTER TABLE statement.  
  
Level: Analyze  
Question: Compare the foreign key approach with the relationship relation approach for handling binary 1:N relationships.  
A) The foreign key approach stores the primary key of the participating entity type in a single table, while the relationship relation approach uses a separate relation R to store both primary keys.  
B) The foreign key approach uses a single foreign key attribute in one of the participating relations, while the relationship relation approach avoids excessive NULL values by creating a new relation S to represent the M:N relationship type.  
C) Both methods establish relationships between tables by referencing primary keys of other tables and are effective for handling binary 1:N relationships.  
D) The foreign key approach is used for regular binary 1:N relationships, while the relationship relation approach is used for recursive relationships only.  
Answer: C) Both methods establish relationships between tables by referencing primary keys of other tables and are effective for handling binary 1:N relationships.  
  
Level: Evaluate  
Question: Justify the use of foreign keys in database systems.  
A) Foreign keys help to maintain data integrity by ensuring that relationships between tables are properly established and enforced.  
B) Foreign keys increase the complexity of database design and should be avoided whenever possible.  
C) Foreign keys are only useful for handling binary M:N relationships, not 1:N or 1:1 relationships.  
D) Foreign keys provide a way to store values from multiple tables in a single column.  
Answer: A) Foreign keys help to maintain data integrity by ensuring that relationships between tables are properly established and enforced.  
  
Level: Create  
Question: Generate an example of a foreign key mapping for the 1:N relationship types WORKS\_FOR, CONTROLS, and SUPERVISION from Figure 9.1.  
A) Include the primary keys of the participating entity types as foreign keys in the relation representing the N-side of the relationship type (e.g., EMPLOYEE for WORKS\_FOR, DEPARTMENT for CONTROLS, and EMPLOYEE itself for SUPERVISION).  
B) Create separate relations for each binary M:N relationship type R and include as foreign key attributes in the new relation S the primary keys of both participating entity types (e.g., WORKS\_FOR would have employee\_id and department\_id as foreign keys).  
C) Use the relationship relation (cross-reference) option to create a separate relation R whose attributes are the primary keys of S and T, which will also be foreign keys to S and T (e.g., for WORKS\_FOR, include employee\_id and department\_id in R as foreign keys).  
D) Avoid using foreign keys for handling 1:N relationships and use a single column to store the primary key of the participating entity type instead (e.g., for WORKS\_FOR, use a single column named dept\_key to store the department's primary key).  
Answer: A) Include the primary keys of the participating entity types as foreign keys in the relation representing the N-side of the relationship type (e.g., EMPLOYEE for WORKS\_FOR, DEPARTMENT for CONTROLS, and EMPLOYEE itself for SUPERVISION).

* Question: Create six multiple choice question and answer of the question with the Functional dependencies concept

Response: Level: Remember  
Question: Define a functional dependency (FD) in the context of the document?  
A) A set of inference rules that can be used to infer new dependencies from a given set of dependencies.  
B) A concept that includes all possible dependencies for a given situation.  
C) The closure F of a set of all functional dependencies that can be inferred from it.  
D) A relation state r of R where X Y holds if and only when r satisfies all the dependencies in F.  
Answer: D) A relation state r of R where X Y holds if and only when r satisfies all the dependencies in F. (PAGE SOURCE: '/content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf', page: 519)  
  
Level: Understand  
Question: Explain what is meant by closure of a set of functional dependencies (F+)?  
A) The final goal of this chapter in the document.  
B) A relation state r of R where X Y holds if and only when r satisfies all the dependencies in F.  
C) The set of all functional dependencies that can be inferred from F.  
D) Some of the additional functional dependencies that we can infer from F.  
Answer: C) The set of all functional dependencies that can be inferred from F. (PAGE SOURCE: '/content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf', page: 519)  
  
Level: Apply  
Question: Solve the problem: Given F = {Ssn Dname, Dnumber Dname}, find the closure of F.  
A) {Ssn Dname, Dnumber Dname, Dnumber Ssn}  
B) {Ssn Dname, Dnumber Dname, Dnumber Ssn, Ssn Dnumber}  
C) {Ssn Dname, Dnumber Dname, Ssn Ssn}  
D) {Ssn Dname, Dnumber Dname, Ssn Dnumber, Dnumber Ssn, Dname Ssn, Dname Dnumber}  
Answer: D) {Ssn Dname, Dnumber Dname, Ssn Dnumber, Dnumber Ssn, Dname Ssn, Dname Dnumber} (PAGE SOURCE: '/content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf', page: 519)  
  
Level: Analyze  
Question: Compare and justify the use of a synthesis approach versus the approach presented in Chapter 14 for large database design projects.  
A) The synthesis approach is more manageable and may evolve over time, while the approach presented in Chapter 14 has not been used in practice due to the difficulty of providing all possible functional dependencies up front before the design can be attempted.  
B) The approach presented in Chapter 14 is theoretically appealing as a formal approach, but the synthesis approach is more practical and easier for large database design projects.  
C) Both approaches are equally difficult and have been used with similar success in large database design projects.  
D) The synthesis approach is less time-consuming than the approach presented in Chapter 14 due to its ability to infer new dependencies from a given set of functional dependencies.  
Answer: A) The synthesis approach is more manageable and may evolve over time, while the approach presented in Chapter 14 has not been used in practice due to the difficulty of providing all possible functional dependencies up front before the design can be attempted. (PAGE SOURCE: '/content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf', page: 517)  
  
Level: Evaluate  
Question: Determine whether Dept\_no Mgr\_phone is an inferred or implied functional dependency given the FDs Dept\_no Mgr\_ssn and Mgr\_ssn Mgr\_phone.  
A) No, since it is not explicitly stated in addition to the two given FDs.  
B) Yes, since it is a possible dependency for a given situation.  
C) Yes, since it holds in every legal relation state r of R where Dept\_no determines Mgr\_ssn and Mgr\_ssn determines Mgr\_phone.  
D) No, since it cannot be inferred or deduced from the FDs in F.  
Answer: A) No, since it is not explicitly stated in addition to the two given FDs. (PAGE SOURCE: '/content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf', page: 519)  
  
Level: Create  
Question: Generate a functional dependency for the following situation: Each department has one manager, and each manager manages multiple departments.  
A) Department\_name Manager\_name  
B) Manager\_name Department\_name  
C) Department\_no Manager\_no  
D) Manager\_no Department\_no  
Answer: B) Manager\_name Department\_name (PAGE SOURCE: '/content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf', page not provided as the situation is hypothetical and not present in the document.)

* Question: Create six multiple choice question and answer of the question with the GRANT command

Response: Level: Remember  
Question (Page Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, page 740): What does A1 need to do to allow account A2 to insert or delete records in the EMPLOYEE and DEPARTMENT tables?  
A) GRANT INSERT ON EMPLOYEE TO A2 AND GRANT DELETE ON DEPARTMENT TO A2  
B) GRANT SELECT ON EMPLOYEE, DEPARTMENT TO A2 WITH GRANT OPTION  
C) GRANT INSERT ON DEPARTMENT TO A2 AND GRANT DELETE ON EMPLOYEE TO A2  
D) None of the above  
Answer: A) GRANT INSERT ON EMPLOYEE TO A2 AND GRANT DELETE ON DEPARTMENT TO A2  
  
Level: Understand  
Question (Page Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, page 740): What does the clause "WITH GRANT OPTION" mean in the command GRANT SELECT ON EMPLOYEE, DEPARTMENT TO A3?  
A) It allows account A3 to select data from the EMPLOYEE and DEPARTMENT tables.  
B) It allows account A3 to propagate the SELECT privilege on the EMPLOYEE and DEPARTMENT tables to other accounts.  
C) It denies any privileges to account A3 on the EMPLOYEE and DEPARTMENT tables.  
D) It sets a limit on the number of records that can be selected from the EMPLOYEE and DEPARTMENT tables by account A3.  
Answer: B) It allows account A3 to propagate the SELECT privilege on the EMPLOYEE and DEPARTMENT tables to other accounts.  
  
Level: Apply  
Question (Page Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, page 740): If A1 wants to allow account A2 to insert or delete records in the EMPLOYEE table only and propagate this privilege to other accounts, what command should be issued?  
A) GRANT INSERT ON EMPLOYEE TO A2 AND GRANT DELETE ON DEPARTMENT TO A2 WITH GRANT OPTION  
B) GRANT SELECT ON EMPLOYEE, DEPARTMENT TO A2 WITH GRANT OPTION  
C) GRANT INSERT ON EMPLOYEE TO A2 AND GRANT SELECT ON DEPARTMENT TO A2 WITH GRANT OPTION  
D) GRANT INSERT ON EMPLOYEE TO A2 AND REVOKE DELETE ON DEPARTMENT FROM A2 WITH GRANT OPTION  
Answer: A) GRANT INSERT ON EMPLOYEE TO A2 AND GRANT DELETE ON EMPLOYEE TO A2 WITH GRANT OPTION  
  
Level: Analyze  
Question (Page Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, page 740): What is the difference between the command "GRANT INSERT ON EMPLOYEE TO A2" and "GRANT SELECT ON EMPLOYEE TO A2"?  
A) The first command allows account A2 to insert records into the EMPLOYEE table, while the second command only allows reading data from the EMPLOYEE table.  
B) The first command allows account A2 to read and delete data from the EMPLOYEE table, while the second command only allows reading data from the EMPLOYEE table.  
C) Both commands allow account A2 to read data from the EMPLOYEE table, but the first command also allows inserting records into the EMPLOYEE table.  
D) Both commands allow account A2 to delete data from the EMPLOYEE table, but the first command also allows reading data from the EMPLOYEE table.  
Answer: C) Both commands allow account A2 to read data from the EMPLOYEE table, but the first command also allows inserting records into the EMPLOYEE table.  
  
Level: Evaluate  
Question (Page Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, page 740): Why can't account A2 grant INSERT and DELETE privileges on the EMPLOYEE and DEPARTMENT tables?  
A) Because the owner account A1 has not given the GRANT OPTION to account A2.  
B) Because the EMPLOYEE and DEPARTMENT tables do not exist in the database.  
C) Because account A2 does not have sufficient permissions to grant privileges on the EMPLOYEE and DEPARTMENT tables.  
D) Because the GRANT command can only be used to grant SELECT privileges, not INSERT or DELETE privileges.  
Answer: A) Because the owner account A1 has not given the GRANT OPTION to account A2.  
  
Level: Create  
Question (Page Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, page 740): What command should be issued to allow account A3 to grant the SELECT privilege on the EMPLOYEE table to other accounts and also select data from the EMPLOYEE table?  
A) GRANT INSERT ON EMPLOYEE TO A3 AND GRANT DELETE ON DEPARTMENT TO A3 WITH GRANT OPTION  
B) GRANT SELECT ON DEPARTMENT TO A3 WITH GRANT OPTION  
C) GRANT SELECT ON EMPLOYEE TO A3 AND REVOKE INSERT ON EMPLOYEE FROM A3 WITH GRANT OPTION  
D) GRANT SELECT ON EMPLOYEE, DEPARTMENT TO A3 WITH GRANT OPTION  
Answer: D) GRANT SELECT ON EMPLOYEE, DEPARTMENT TO A3 WITH GRANT OPTION

* Question: Create six multiple choice question and answer of the question with the GROUP BY command

Response: Question Level: Understand (Level 2)  
Question: Explain what is the purpose of the GROUP BY clause in SQL?  
A) To create a summary tuple from a table  
B) To specify a correlated nested query with an aggregate function  
C) To retrieve the names of all employees who have two or more dependents  
D) To count the number of dependents that each employee has  
Answer: A) To create a summary tuple from a table  
  
Question Level: Remember (Level 1)  
Question: Define the GROUP BY clause in SQL.  
A) It creates a summary tuple from a table  
B) It retrieves the names of all employees who have two or more dependents  
C) It specifies a correlated nested query with an aggregate function  
D) It counts the number of dependents that each employee has  
Answer: A) It creates a summary tuple from a table  
  
Question Level: Analyze (Level 4)  
Question: Compare and contrast GROUP BY and HAVING clauses in SQL.  
A) Both are used to create a summary tuple from a table, but GROUP BY is used for grouping data while HAVING is used for filtering data  
B) GROUP BY is used to retrieve the names of all employees who have two or more dependents, while HAVING is used to count the number of dependents that each employee has  
C) Both are used to specify a correlated nested query with an aggregate function  
D) GROUP BY and HAVING are the same things.  
Answer: A) Both are used to create a summary tuple from a table, but GROUP BY is used for grouping data while HAVING is used for filtering data  
  
Question Level: Evaluate (Level 5)  
Question: Determine why we need the HAVING clause in SQL along with the GROUP BY clause.  
A) To retrieve the names of all employees who have two or more dependents  
B) To count the number of dependents that each employee has  
C) To create a summary tuple from a table and filter out unwanted data  
D) To specify a correlated nested query with an aggregate function  
Answer: C) To create a summary tuple from a table and filter out unwanted data  
  
Question Level: Create (Level 6)  
Question: Generate an example SQL query that uses the GROUP BY clause to get the number of majors in each department.  
A) SELECT COUNT (\*) FROM Department WHERE S.Majors\_in.Dname = 'Computer Science'  
B) SELECT Dname, COUNT(\*) FROM Department GROUP BY Dname;  
C) SELECT Lname, Fname FROM EMPLOYEE WHERE ( SELECT COUNT (\*) FROM DEPENDENT WHERE Ssn = Essn ) > = 2;  
D) SELECT SOME (\*) FROM Boolean\_values WHERE value = TRUE;  
Answer: B) SELECT Dname, COUNT(\*) FROM Department GROUP BY Dname;  
  
Question Level: Create (Level 6)  
Question: Develop a SQL query that uses the GROUP BY clause to find out how many employees in each department have more than 5 dependents.  
A) SELECT Dname, COUNT(\*) FROM Employee JOIN Dependent ON Employee.Ssn = Dependent.Essn GROUP BY Dname HAVING COUNT(\*) > 5;  
B) SELECT Dname, COUNT(\*) FROM Department WHERE (SELECT COUNT(\*) FROM Employee JOIN Dependent ON Employee.Ssn = Dependent.Essn) > 5 GROUP BY Dname;  
C) SELECT Dname, COUNT(\*) FROM Department GROUP BY Dname HAVING (SELECT COUNT(\*) FROM Employee JOIN Dependent ON Employee.Ssn = Dependent.Essn) > 5;  
D) SELECT Dname, COUNT(\*) FROM Employee JOIN Dependent ON Employee.Ssn = Dependent.Essn GROUP BY Dname HAVING COUNT(\*) > 5;  
Answer: C) SELECT Dname, COUNT(\*) FROM Department GROUP BY Dname HAVING (SELECT COUNT(\*) FROM Employee JOIN Dependent ON Employee.Ssn = Dependent.Essn) > 5;

* Question: Create six multiple choice question and answer of the question with the HAVING comand

Response: Question Level: Understand (Describe)  
Question: What is the purpose of the HAVING command in SQL?  
A) To count the number of tuples in a table.  
B) To specify a correlated nested query with an aggregate function.  
C) To check whether the result of a nested query is empty or not.  
D) To retrieve the names of all employees who have two or more dependents.  
Answer: D) To retrieve the names of all employees who have two or more dependents.  
  
Question Level: Analyze (Compare)  
Question: How is the HAVING command different from the WHERE clause in SQL?  
A) The HAVING command can only be used with aggregate functions, while the WHERE clause can be used with any condition.  
B) The HAVING command is only used for filtering groups of rows, while the WHERE clause is used for filtering individual rows.  
C) Both the HAVING and WHERE clauses are used for filtering groups of rows, but the HAVING clause can also be used with aggregate functions.  
D) The HAVING command is only used for counting the number of tuples in a table, while the WHERE clause is used for any condition.  
Answer: C) Both the HAVING and WHERE clauses are used for filtering groups of rows, but the HAVING clause can also be used with aggregate functions.  
  
Question Level: Evaluate (Justify)  
Question: Why would you use the HAVING command instead of the WHERE clause in a SQL query?  
A) If you want to retrieve the names of all employees who have two or more dependents, you would use the HAVING command because it allows you to filter groups of rows using aggregate functions.  
B) If you want to count the number of tuples in a table, you would use the WHERE clause because it is faster than the HAVING command.  
C) If you want to check whether the result of a nested query is empty or not, you would use the HAVING command because it is more efficient than the WHERE clause for this purpose.  
D) There is no reason to use the HAVING command instead of the WHERE clause in a SQL query.  
Answer: A) If you want to retrieve the names of all employees who have two or more dependents, you would use the HAVING command because it allows you to filter groups of rows using aggregate functions.  
  
Question Level: Create (Generate)  
Question: Write a SQL query that uses the HAVING command to find all departments with an average salary greater than 50000.  
A) SELECT AVG(Salary) FROM DEPARTMENT GROUP BY Department\_id HAVING AVG(Salary) > 50000;  
B) SELECT Department\_id, AVG(Salary) FROM DEPARTMENT WHERE AVG(Salary) > 50000;  
C) SELECT Department\_id FROM DEPARTMENT GROUP BY Department\_id HAVING (SELECT AVG(Salary) FROM DEPARTMENT WHERE Department\_id = Dept\_id) > 50000;  
D) None of the above.  
Answer: A) SELECT AVG(Salary) FROM DEPARTMENT GROUP BY Department\_id HAVING AVG(Salary) > 50000;  
  
Question Level: Create (Modify)  
Question: Modify the query in option A to find all departments with an average salary greater than or equal to 50000.  
A) SELECT AVG(Salary) FROM DEPARTMENT GROUP BY Department\_id HAVING AVG(Salary) >= 50000;  
B) SELECT AVG(Salary) FROM DEPARTMENT WHERE AVG(Salary) >= 50000;  
C) SELECT Department\_id, AVG(Salary) FROM DEPARTMENT GROUP BY Department\_id HAVING (SELECT AVG(Salary) FROM DEPARTMENT WHERE Department\_id = Dept\_id) >= 50000;  
D) None of the above.  
Answer: A) SELECT AVG(Salary) FROM DEPARTMENT GROUP BY Department\_id HAVING AVG(Salary) >= 50000;

* Question: Create six multiple choice question and answer of the question with the Implied concept

Response: Level: Remember  
Question: Define Factoid Questions in Question Answering Systems.  
A) A type of question that requires complex reasoning or interpretation.  
B) A type of question that pinpoints the right phrase in a document or database.  
C) A type of question that asks for an opinion or judgment.  
D) A type of question that requires an extensive knowledge base to answer.  
Answer: B) A type of question that pinpoints the right phrase in a document or database. (PAGE SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf - Page 1074)  
  
Level: Understand  
Question: Explain the concept of Statement Parameters in PreparedStatement queries.  
A) Parameters that are fixed values and not changeable during query execution.  
B) Parameters that are variables determined at runtime, typically by binding them to a Java program variable.  
C) Parameters that represent an action or operation to be performed on the database.  
D) Parameters that are used for filtering the results of a query.  
Answer: B) Parameters that are variables determined at runtime, typically by binding them to a Java program variable. (PAGE SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf - Page 470)  
  
Level: Apply  
Question: Solve the following PreparedStatement query with binding parameters: "SELECT \* FROM Customers WHERE Country = ? AND City = ?". If the country is 'USA' and the city is 'New York', which function should be used to bind these parameters?  
A) setInteger()  
B) setString()  
C) setBoolean()  
D) setDate()  
Answer: B) setString() (PAGE SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf - Page 470)  
  
Level: Analyze  
Question: Compare and contrast Surface Pattern Matching and Structural Matching in Candidate Answer Generation.  
A) Both are methods used to match regular expression templates against lexical chunks of retrieved passages, but structural matching requires parsing questions and retrieved passages while surface pattern matching does not.  
B) Both are methods used to parse questions and retrieved passages, but structural matching requires aligning focus words with passages containing potential answers while surface pattern matching does not.  
C) Surface Pattern Matching is a method that replaces phrases from the question with lexical chunks of retrieved passages, while Structural Matching is a method that identifies the structure of the question and the structure of the answer in the retrieved passage.  
D) Both are methods used to extract answers from passages by using regular expression templates, but surface pattern matching requires the use of focus words while structural matching does not.  
Answer: C) Surface Pattern Matching is a method that replaces phrases from the question with lexical chunks of retrieved passages, while Structural Matching is a method that identifies the structure of the question and the structure of the answer in the retrieved passage. (PAGE SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf - Page 471)  
  
Level: Evaluate  
Question: Determine whether the following statement is true or false based on the document context: "PreparedStatement queries are executed only once."  
A) True  
B) False  
Answer: False (PAGE SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf - Page 470)  
  
Level: Create  
Question: Generate a question that tests the understanding of Database Design Theory and Normalization as discussed in the document.  
A) What is the purpose of Database Design Theory?  
B) Explain how normalization affects database design.  
C) Describe the steps involved in normalizing a database.  
D) Develop a scenario where normalization plays an important role in improving database performance.  
Answer: C) Describe the steps involved in normalizing a database. (PAGE SOURCE: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf - Page 346)

* Question: Create six multiple choice question and answer of the question with the Inner Join concept

Response: Level: Remember  
Question: Define inner join?  
A) A type of join operation that retrieves only the matching tuples from two or more tables.  
B) A type of join operation that retrieves all tuples from both tables regardless of any match.  
C) A type of join operation that performs a Cartesian product and selection operation on two or more tables.  
D) A type of join operation that combines the rows from two or more tables based on a common column value.  
Answer: D) A type of join operation that combines the rows from two or more tables based on a common column value. [Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, Page 267]  
  
Level: Understand  
Question: Explain what is meant by "CARTESIAN PRODUCT" in the context of inner join?  
A) A mathematical operation that combines two sets and returns their cross product.  
B) A type of join operation that retrieves all possible combinations of rows from two tables.  
C) A type of join operation that only retrieves matching tuples from two or more tables.  
D) A type of join operation that is used to perform a selection on two or more tables.  
Answer: B) A type of join operation that retrieves all possible combinations of rows from two tables. [Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, Page 267]  
  
Level: Apply  
Question: Solve the following three-way inner join query: ((PROJECT Dnum=Dnumber DEPARTMENT) Mgr\_ssn=Ssn EMPLOYEE). What is the result of this query?  
A) A table containing all the departments, their corresponding projects, and their managers.  
B) A table containing only the departments that have managers who are also project managers.  
C) A table containing all the employees who are both department managers and project managers.  
D) A table containing all the projects that have department managers who are also project managers.  
Answer: A) A table containing all the departments, their corresponding projects, and their managers. [Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, Page 268]  
  
Level: Analyze  
Question: Compare inner join and outer join. What is the main difference between them?  
A) Inner join retrieves only matching tuples while outer join includes all tuples from both tables regardless of any match.  
B) Inner join performs a Cartesian product while outer join does not.  
C) Outer join retrieves all possible combinations of rows from two tables, while inner join only retrieves matching tuples.  
D) Inner join is used for multiway joins while outer join is used for two-way joins.  
Answer: A) Inner join retrieves only matching tuples while outer join includes all tuples from both tables regardless of any match. [Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, Page 267 and 681]  
  
Level: Evaluate  
Question: Determine the appropriate inner join query for a database that includes three tables (EMPLOYEE, DEPARTMENT, PROJECT) and the user requires a result set containing all employees who work in the departments that are involved in a specific project.  
A) SELECT E.\* FROM EMPLOYEE AS E INNER JOIN DEPARTMENT AS D ON E.Dno = D.Dnumber INNER JOIN PROJECT AS P ON D.Dnum = P.Pnumber WHERE P.Pname = 'ProjectX';  
B) SELECT E.\* FROM EMPLOYEE AS E LEFT OUTER JOIN DEPARTMENT AS D ON E.Dno = D.Dnumber LEFT OUTER JOIN PROJECT AS P ON D.Dnum = P.Pnumber WHERE P.Pname = 'ProjectX';  
C) SELECT E.\* FROM EMPLOYEE AS E RIGHT OUTER JOIN DEPARTMENT AS D ON E.Dno = D.Dnumber RIGHT OUTER JOIN PROJECT AS P ON D.Dnum = P.Pnumber WHERE P.Pname = 'ProjectX';  
D) SELECT E.\* FROM EMPLOYEE AS E FULL OUTER JOIN DEPARTMENT AS D ON E.Dno = D.Dnumber FULL OUTER JOIN PROJECT AS P ON D.Dnum = P.Pnumber WHERE P.Pname = 'ProjectX';  
Answer: A) SELECT E.\* FROM EMPLOYEE AS E INNER JOIN DEPARTMENT AS D ON E.Dno = D.Dnumber INNER JOIN PROJECT AS P ON D.Dnum = P.Pnumber WHERE P.Pname = 'ProjectX'; [Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, Page 267]  
  
Level: Create  
Question: Generate a SQL query that performs an inner join on the EMPLOYEE and DEPARTMENT tables where the employees work in the department with at least 5 staff members using a subquery to get the departments with more than or equal to 5 staff members.  
A) SELECT E.\* FROM EMPLOYEE AS E INNER JOIN (SELECT D.\* FROM DEPARTMENT AS D WHERE (SELECT COUNT(\*) FROM EMPLOYEE AS E2 WHERE E2.Dno = D.Dnumber) >= 5) AS Departments ON E.Dno = Departments.Dnumber;  
B) SELECT E.\* FROM EMPLOYEE AS E INNER JOIN DEPARTMENT AS D ON (SELECT COUNT(\*) FROM EMPLOYEE AS E2 WHERE E2.Dno = D.Dnumber) >= 5;  
C) SELECT E.\* FROM EMPLOYEE AS E INNER JOIN DEPARTMENT AS D ON (SELECT COUNT(\*) FROM EMPLOYEE AS E2 WHERE E2.Dno = D.Dnumber AND E2.staff\_count >= 5);  
D) SELECT E.\* FROM EMPLOYEE AS E LEFT OUTER JOIN DEPARTMENT AS D ON (SELECT COUNT(\*) FROM EMPLOYEE AS E2 WHERE E2.Dno = D.Dnumber AND E2.staff\_count >= 5);  
Answer: C) SELECT E.\* FROM EMPLOYEE AS E INNER JOIN DEPARTMENT AS D ON (SELECT COUNT(\*) FROM EMPLOYEE AS E2 WHERE E2.Dno = D.Dnumber AND E2.staff\_count >= 5); [Source: /content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf, Page 692]

* Question: Create six multiple choice question and answer of the question with the INSERT command

Response: Level: Remember  
Question: Define the purpose of the `INSERT` command in SQL?  
A) To modify the database  
B) To delete records from a table  
C) To update records in a table  
D) To add new records to a table  
Answer: D) To add new records to a table  
  
Level: Understand  
Question: Explain the simplest form of using the `INSERT` command in SQL?  
A) It requires specifying relation names and a list of values for the tuple  
B) The values should be listed in random order  
C) It is used to delete a single tuple from a table  
D) It doesn't require any specific attribute names or values provided  
Answer: A) It requires specifying relation names and a list of values for the tuple  
  
Level: Apply  
Question: Solve the following example of adding a new tuple to an `EMPLOYEE` relation using the INSERT command:  
U1: INSERT INTO EMPLOYEE VALUES ( Richard, K, Marini, 653298653, 1962-12-30, 98 Oak Forest, Katy, TX, M, 37000, 653298653, 4 );  
A) The tuple has been added successfully to the EMPLOYEE relation  
B) An error occurred while adding the tuple as the attribute 'Fname' is missing  
C) The tuple could not be added because the 'Lname' value is invalid  
D) An error occurred due to the incorrect order of attribute values in the INSERT command  
Answer: A) The tuple has been added successfully to the EMPLOYEE relation  
  
Level: Analyze  
Question: Compare and justify the two forms of the `INSERT` statement in SQL.  
A) Both forms allow adding new tuples with explicit attribute names, but only the second form requires all attributes with NOT NULL specification and no default value  
B) The first form can add new tuples without specifying attribute names, while the second form is used when a relation has many attributes but only some are assigned values in the new tuple  
C) Both forms require all attributes to be specified in the INSERT command regardless of their NOT NULL or DEFAULT values  
D) The first form adds new tuples with explicit attribute names, whereas the second form does not specify any attribute names  
Answer: B) The first form can add new tuples without specifying attribute names, while the second form is used when a relation has many attributes but only some are assigned values in the new tuple  
  
Level: Evaluate  
Question: Determine if the following SQL statement is valid to insert multiple tuples into an EMPLOYEE relation:  
U1: INSERT INTO EMPLOYEE (Fname, Lname) VALUES ('John', 'Doe'), ('Jane', 'Smith');  
A) Yes, it is a valid SQL statement that inserts two new tuples into the EMPLOYEE relation  
B) No, the statement is invalid because the attribute values forming each tuple are not enclosed in parentheses  
C) Yes, but only the first tuple has been inserted successfully since the second tuple does not include all required attributes  
D) No, it's missing the relation name and the list of values for the tuples  
Answer: A) Yes, it is a valid SQL statement that inserts two new tuples into the EMPLOYEE relation  
  
Level: Create  
Question: Generate an SQL statement to insert a new tuple into the EMPLOYEE table using the second form of the INSERT command for the following attributes and values: Fname='John', Lname='Doe', Dno=3, Ssn='123-45-6789'  
A) INSERT INTO EMPLOYEE (Fname, Lname, Dno, Ssn) VALUES ('John', 'Doe', 3, '123-45-6789');  
B) INSERT INTO EMPLOYEE VALUES ('John', 'Doe', 3, '123-45-6789');  
C) INSERT INTO EMPLOYEE VALUES (Fname='John', Lname='Doe', Dno=3, Ssn='123-45-6789');  
D) INSERT INTO EMPLOYEE (3, '123-45-6789', 'John', 'Doe');  
Answer: A) INSERT INTO EMPLOYEE (Fname, Lname, Dno, Ssn) VALUES ('John', 'Doe', 3, '123-45-6789');

* Question: Create six multiple choice question and answer of the question with the Intersection concept

Response: LEVEL: Remember  
QUESTION: Define the concept of Intersection in the context of databases.  
A) A method for combining tuples from two relations, producing all possible combinations.  
B) An operation that can be used to select objects based on their spatial relationships.  
C) If the view is defined as V= R S, when a new tuple ri is inserted, it is compared against the s relation to see if it is present there. If present, it is inserted in v, else not. If tuple rd is deleted, it is matched against the view v and, if present there, it is removed from the view.  
D) A condition such as Find all freeways that go through Arlington, Texas would involve an intersects operation, to determine which freeways (lines) intersect the city boundary (polygon).  
ANSWER: C [SOURCE]  
  
LEVEL: Understand  
QUESTION: Explain how a new tuple is inserted and an existing one is deleted when dealing with a view defined as V= R S.  
A) When a new tuple is inserted, it is matched against the view v, if present there, it is removed from the view. If a tuple rd is deleted, it is compared against the s relation to see if it is present there. If present, it is removed from s and then from v.  
B) When a new tuple is inserted, it is matched against the s relation to see if it is present there. If present, it is inserted in v, else not. If tuple rd is deleted, it is compared against the view v and, if present there, it is removed from v.  
C) When a new tuple is inserted, it is matched against both R and S relations to see if it is present in either one. If present, it is inserted in v, else not. If a tuple rd is deleted, it is compared against the view v and, if present there, it is removed from v.  
D) When a new tuple is inserted, it is matched against both R and S relations to see if it is present in either one. If present, it is inserted in s, else not. If a tuple rd is deleted, it is compared against the view v and, if present there, it is removed from v and then from s.  
ANSWER: B [SOURCE]  
  
LEVEL: Apply  
QUESTION: Solve the following scenario: You have a relation R with tuples (A, 1), (B, 2) and (C, 3) and a relation S with tuples (B, 4) and (D, 5). If we create a view V= R S, what will the view contain?  
A) Tuples (A, 1), (B, 2) and (C, 3).  
B) Tuples (B, 2) and (B, 4).  
C) Tuples (B, 2), (D, 5).  
D) Empty set.  
ANSWER: B [SOURCE]  
  
LEVEL: Analyze  
QUESTION: Compare Intersection operation with the Union and Set Difference operations in databases.  
A) All three operations are used to combine tuples from two relations, producing all possible combinations. The difference is that Intersection only compares tuples against the s relation while Union and Set Difference compare tuples against both R and S relations.  
B) All three operations are used to combine tuples from two relations, producing all possible combinations. The difference is that Intersection only compares tuples against both R and S relations while Union and Set Difference compare tuples against the s relation.  
C) Union and Set Difference operations are set operations that can be used to combine tuples from two relations, but they are rarely used in practice. In contrast, Intersection is a method for comparing tuples against the s relation when a new tuple is inserted or deleted in a view defined as V= R S.  
D) Union and Set Difference operations are set operations that can be used to compare tuples against the s relation when a new tuple is inserted or deleted in a view defined as V= R S. In contrast, Intersection is rarely used in practice and is only used for spatial data types and models.  
ANSWER: C [SOURCE]  
  
LEVEL: Evaluate  
QUESTION: Determine whether the following statement is true or false: If a tuple ri is inserted into R, it will be automatically inserted into the view V= R S as well.  
A) True, if the tuple ri is present in the s relation, it will be inserted into the view V= R S as well.  
B) False, if the tuple ri is not present in the s relation, it will not be inserted into the view V= R S.  
C) True, without checking whether the tuple ri is present in the s relation or not, it will be automatically inserted into the view V= R S.  
D) False, if the tuple ri is not present in the s relation, it will be compared against the view v and, if present there, it will be removed from the view instead of being inserted.  
ANSWER: B [SOURCE]  
  
LEVEL: Create  
QUESTION: Generate a scenario where Intersection operation would be useful in practice.  
A) A database stores information about two companies, CompanyA and CompanyB, including their employees' names, positions, and salaries. The user wants to find out the common employees who have the same position between these two companies. This can be achieved by creating a view V= CompanyA CompanyB based on the intersection of employee relations in each company.  
B) A database stores information about two universities, UniversityX and UniversityY, including their students' names, courses they are enrolled in, and grades they received. The user wants to find out which courses have the same students enrolled between these two universities. This can be achieved by creating a view V= UniversityX UniversityY based on the intersection of student-course relations in each university.  
C) A database stores information about two cities, CityA and CityB, including their landmarks, street names, and locations. The user wants to find out which streets are shared between these two cities. This can be achieved by creating a view V= CityA CityB based on the intersection of street relations in each city.  
D) A database stores information about two libraries, LibraryX and LibraryY, including books they have in stock and their locations within the library. The user wants to find out which books are located in the same section between these two libraries. This can be achieved by creating a view V= LibraryX LibraryY based on the intersection of book-location relations in each library.  
ANSWER: All are correct [SOURCE]