Question & Response Results

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

Response: Here are six multiple-choice questions based on the provided text:  
  
\*\*Question 1: LEVEL - Remember, PAGE SOURCE - 1155\*\*  
  
Define Content-based access control. A) A mechanism to restrict access to a database based on user characteristics B) A method to grant access to data objects based on their content C) A technique to manage access to confidential information D) A process to authenticate users and manage their access Answer: B) A method to grant access to data objects based on their content  
  
\*\*Question 2: LEVEL - Understand, PAGE SOURCE - 1155\*\*  
  
Explain the requirement for supporting Content-based access control. A) To allow for flexible querying of traditional data B) To enable heterogeneous subjects in an RBAC system C) To account for user profiles in access control policies D) To support mandatory access control Answer: C) To account for user profiles in access control policies  
  
\*\*Question 3: LEVEL - Apply, PAGE SOURCE - 1155\*\*  
  
Which of the following is a possible solution to support content-based access control?

A) Inclusion of conditions based on object content in access control policies

B) Support for credentials to represent user characteristics and qualifications

C) Mandatory access control for all users

D) Role-Based Access Control (RBAC)

Answer: A) Inclusion of conditions based on object content in access control policies  
  
\*\*Question 4: LEVEL - Analyze, PAGE SOURCE - 1155\*\*  
  
Compare the differences between traditional data and processes, knowledge, and experience.  
  
A) Traditional data is a specific type of process  
B) Processes, knowledge, and experience are different forms of data  
C) Traditional data is more complex than processes, knowledge, and experience  
D) Processes, knowledge, and experience are less important than traditional data  
  
Answer: B) Processes, knowledge, and experience are different forms of data  
  
\*\*Question 5: LEVEL - Evaluate, PAGE SOURCE - None\*\*  
  
Justify the importance of identity management in RBAC systems.  
  
A) It ensures that all users have unique identities  
B) It allows for flexible role activation and deactivation  
C) It addresses how organizations can authenticate people and manage access to confidential information  
D) It is only relevant for mandatory access control  
  
Answer: C) It addresses how organizations can authenticate people and manage access to confidential information  
  
\*\*Question 6: LEVEL - Create, PAGE SOURCE - None\*\*  
  
Develop a scenario where Content-based access control would be beneficial.  
  
A) A library allowing users to access books based on their content  
B) An e-commerce platform restricting access to products based on user characteristics  
C) A healthcare system controlling access to patient records based on the record's contents  
D) A university database granting access to students based on their role  
  
Answer: C) A healthcare system controlling access to patient records based on the record's contents

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

Response: Here are six multiple-choice questions and answers based on the concept of ACID Properties:  
  
\*\*LEVEL 1: Remember\*\*  
\*\*PAGE SOURCE\*\*: Fundamentals of Database Systems Seventh Edition, page 771  
\*\*Question\*\*: What is the first property of Transactions?  
A) Consistency preservation  
B) Atomicity  
C) Durability  
D) Isolation  
  
\*\*Answer\*\*: B) Atomicity  
  
\*\*LEVEL 2: Understand\*\*  
\*\*PAGE SOURCE\*\*: Fundamentals of Database Systems Seventh Edition, page 771  
\*\*Question\*\*: What does it mean for a transaction to be "atomic"?  
A) It is performed quickly  
B) It is performed in its entirety or not at all  
C) It is performed simultaneously with other transactions  
D) It is performed only when the database is consistent  
  
\*\*Answer\*\*: B) It is performed in its entirety or not at all  
  
\*\*LEVEL 3: Apply\*\*  
\*\*PAGE SOURCE\*\*: Fundamentals of Database Systems Seventh Edition, page 771  
\*\*Question\*\*: A transaction updates a customer's balance from $100 to $150. If the transaction fails, what should happen?  
A) The balance remains at $100  
B) The balance is set to $0  
C) The balance is set to $200  
D) The balance remains at $150  
  
\*\*Answer\*\*: A) The balance remains at $100  
  
\*\*LEVEL 4: Analyze\*\*  
\*\*PAGE SOURCE\*\*: Fundamentals of Database Systems Seventh Edition, page 771  
\*\*Question\*\*: Compare and contrast Consistency preservation with Durability.  
A) Consistency preservation ensures the database remains consistent, while Durability ensures the transaction is performed correctly  
B) Consistency preservation ensures the transaction is performed correctly, while Durability ensures the database remains consistent  
C) Both properties ensure the database remains consistent  
D) Both properties ensure the transaction is performed correctly  
  
\*\*Answer\*\*: A) Consistency preservation ensures the database remains consistent, while Durability ensures the transaction is performed correctly  
  
\*\*LEVEL 5: Evaluate\*\*  
\*\*PAGE SOURCE\*\*: Fundamentals of Database Systems Seventh Edition, page 771  
\*\*Question\*\*: Justify whether a transaction that updates a customer's balance from $100 to $150 and then sends an invoice should possess all ACID properties.  
A) Yes, it should possess all ACID properties  
B) No, it only needs to possess Atomicity and Consistency preservation  
C) No, it does not need to possess any of the ACID properties  
D) Maybe, it depends on the specific database system being used  
  
\*\*Answer\*\*: A) Yes, it should possess all ACID properties  
  
\*\*LEVEL 6: Create\*\*  
\*\*PAGE SOURCE\*\*: Fundamentals of Database Systems Seventh Edition, page 771  
\*\*Question\*\*: Generate a scenario where a transaction that updates a customer's balance from $100 to $150 and then sends an invoice does not possess one of the ACID properties.  
A) It only possesses Atomicity but not Consistency preservation  
B) It only possesses Durability but not Isolation  
C) It only possesses Isolation but not Consistency preservation  
D) It does not possess any of the ACID properties  
  
\*\*Answer\*\*: A) It only possesses Atomicity but not Consistency preservation

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

Response: Here are six multiple-choice questions and answers based on the provided text:  
  
\*\*LEVEL 1: Remember\*\*  
Question: What is the main difference between the CREATE ASSERTION and individual domain constraints and tuple constraints in SQL?  
A) The CHECK clauses are checked only when tuples are inserted or updated  
B) The CHECK clauses are checked for all data modifications  
C) The 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 insertion or updating of tuples  
D) The schema designer should use CREATE ASSERTION only in cases where it is not possible to use CHECK on attributes, domains, or tuples  
  
Answer: A) The CHECK clauses are checked only when tuples are inserted or updated  
  
\*\*LEVEL 2: Understand\*\*  
Question: What does the ALTER TABLE command in SQL allow a schema designer to do?  
A) Create new relations (tables)  
B) Modify existing relations (tables)  
C) Drop existing relations (tables)  
D) View the structure of a relation (table)  
  
Answer: B) Modify existing relations (tables)  
  
\*\*LEVEL 3: Apply\*\*  
Question: Suppose you want to add a new attribute "Job" to each individual EMPLOYEE tuple. How can this be done using SQL?  
A) By specifying a default clause  
B) By using the UPDATE command individually on each tuple  
C) By using the CHECK constraint  
D) By using the CREATE ASSERTION statement  
  
Answer: A) By specifying a default clause  
  
\*\*LEVEL 4: Analyze\*\*  
Question: Compare and contrast the DROP TABLE and ALTER TABLE commands in SQL.  
A) DROP TABLE is used to create new tables, while ALTER TABLE is used to modify existing tables  
B) DROP TABLE is used to modify existing tables, while ALTER TABLE is used to drop existing tables  
C) Both DROP TABLE and ALTER TABLE are used to modify existing tables  
D) Neither DROP TABLE nor ALTER TABLE is used for modifying tables  
  
Answer: C) Both DROP TABLE and ALTER TABLE are used to modify existing tables  
  
\*\*LEVEL 5: Evaluate\*\*  
Question: Justify the use of CHECK constraints on attributes, domains, or tuples in SQL.  
A) To ensure that data modifications are atomic  
B) To ensure that data is consistent with the schema design  
C) To prevent unauthorized access to the database  
D) To optimize query performance  
  
Answer: B) To ensure that data is consistent with the schema design  
  
\*\*LEVEL 6: Create\*\*  
Question: Generate a SQL command to modify an existing table "EMPLOYEE" by dropping the attribute "Address".  
A) ALTER TABLE EMPLOYEE DROP COLUMN Address CASCADE;  
B) ALTER TABLE EMPLOYEE DROP COLUMN Address RESTRICT;  
C) CREATE TABLE EMPLOYEE NEW (DROP COLUMN Address);  
D) UPDATE EMPLOYEE SET Address = NULL;  
  
Answer: A) ALTER TABLE EMPLOYEE DROP COLUMN Address CASCADE;

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

Response: Here are six multiple-choice questions and answers based on the context about Attribute concepts:  
  
\*\*Question 1:\*\* (Level: Remember)  
Define what is meant by a NULL attribute value.  
A) The attribute exists but has no value.  
B) The attribute does not exist at all.  
C) The attribute's value is unknown.  
D) The attribute's value is missing.  
  
Answer: C) The attribute's value is unknown.  
  
\*\*LEVEL:\*\* 1 (Remember)  
\*\*PAGE SOURCE:\*\* Page 79  
  
\*\*Question 2:\*\* (Level: Understand)  
Explain the difference between a complex attribute and other types of attributes in a database system.  
A) A complex attribute has multiple values, while other attributes have single values.  
B) A complex attribute can be nested arbitrarily, unlike other attributes.  
C) A complex attribute is always multivalued, whereas other attributes are not.  
D) A complex attribute is used to store derived attribute values.  
  
Answer: B) A complex attribute can be nested arbitrarily, unlike other attributes.  
  
\*\*LEVEL:\*\* 2 (Understand)  
\*\*PAGE SOURCE:\*\* Page 79  
  
\*\*Question 3:\*\* (Level: Apply)  
Solve the problem of representing arbitrary nesting in a database system by grouping what type of attributes?  
A) Multivalued attributes  
B) Composite attributes  
C) Complex attributes  
D) Stored attributes  
  
Answer: B) Composite attributes  
  
\*\*LEVEL:\*\* 3 (Apply)  
\*\*PAGE SOURCE:\*\* Page 79  
  
\*\*Question 4:\*\* (Level: Analyze)  
Compare the concepts of stored and derived attributes in a database system.  
A) A stored attribute is always derived, while a derived attribute is always stored.  
B) Both stored and derived attributes are calculated values.  
C) A stored attribute has a fixed value, whereas a derived attribute changes over time.  
D) Stored attributes are used for multivalued data, while derived attributes are used for single-valued data.  
  
Answer: C) A stored attribute has a fixed value, whereas a derived attribute changes over time.  
  
\*\*LEVEL:\*\* 4 (Analyze)  
\*\*PAGE SOURCE:\*\* Page 420  
  
\*\*Question 5:\*\* (Level: Evaluate)  
Justify the need to partition quantitative attribute values into non-overlapping intervals for association rule mining.  
A) To improve data compression  
B) To enhance decision-making capabilities  
C) To handle categorical attributes with numerical values  
D) To enable apriori-type algorithm usage  
  
Answer: D) To enable apriori-type algorithm usage  
  
\*\*LEVEL:\*\* 5 (Evaluate)  
\*\*PAGE SOURCE:\*\* Page 1096  
  
\*\*Question 6:\*\* (Level: Create)  
Modify the concept hierarchy for Salary attribute values to create a more granular partitioning scheme.  
A) Group low-income earners into 3 sub-categories (0-19,999, 20,000-29,999, and 30,000-39,999)  
B) Assign labels based on job titles instead of salary ranges  
C) Create separate categories for high-income individuals and middle-class workers  
D) Partition salaries based on industry-specific benchmarks  
  
Answer: A) Group low-income earners into 3 sub-categories (0-19,999, 20,000-29,999, and 30,000-39,999)  
  
\*\*LEVEL:\*\* 6 (Create)  
\*\*PAGE SOURCE:\*\* Page 1083

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

Response: Here are six multiple-choice questions based on the context about the concept of Authentication:  
  
\*\*Remember Level\*\*  
  
1. What is authentication in data mining?  
A) A process to identify users  
B) A method to classify data  
C) An approach to mine data  
D) A technique to compress data  
  
Answer: A) A process to identify users  
  
LEVEL: Remember  
PAGE SOURCE: 1085  
  
\*\*Understand Level\*\*  
  
2. What is the main objective of authentication in data mining?  
A) To authorize access to sensitive information  
B) To classify data into different categories  
C) To mine patterns from large datasets  
D) To compress data for faster processing  
  
Answer: A) To authorize access to sensitive information  
  
LEVEL: Understand  
PAGE SOURCE: 1085  
  
\*\*Apply Level\*\*  
  
3. How does authentication typically work in data mining?  
A) By comparing user parameters with a database  
B) By analyzing user behavior patterns  
C) By classifying users into different categories  
D) By compressing user data for faster processing  
  
Answer: A) By comparing user parameters with a database  
  
LEVEL: Apply  
PAGE SOURCE: 1085  
  
\*\*Analyze Level\*\*  
  
4. What are the two main forms of authentication in data mining?  
A) Authentication and Authorization  
B) Classification and Regression  
C) Authentication and Encryption  
D) Identification and Verification  
  
Answer: D) Identification and Verification  
  
LEVEL: Analyze  
PAGE SOURCE: 1140  
  
\*\*Evaluate Level\*\*  
  
5. Why is it important to consider external characteristics during the authentication process?  
A) To ensure the user has the necessary permissions  
B) To verify the user's identity  
C) To track previous queries for sensitive data  
D) To authorize access to sensitive information  
  
Answer: C) To track previous queries for sensitive data  
  
LEVEL: Evaluate  
PAGE SOURCE: 1140  
  
\*\*Create Level\*\*  
  
6. How can digital signatures ensure that a message comes from its originator?  
A) By encrypting the message with a public key  
B) By compressing the message to reduce its size  
C) By hashing the message with a secret number  
D) By using a unique timestamp and secret number  
  
Answer: D) By using a unique timestamp and secret number  
  
LEVEL: Create  
PAGE SOURCE: 1166

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

Response: Here are six multiple-choice questions based on the context, related to the Boyce-Codd Normal Form (BCNF):  
  
\*\*Remember\*\*  
LEVEL: Remember  
PAGE SOURCE: 501  
  
Question: What is the proposed definition of Boyce-Codd Normal Form (BCNF)?A) A simpler form of 3NF B) A stricter definition of a normal form than 3NF C) The highest normal form in relational database design D) Only applicable for relations with candidate keys Answer: B) A stricter definition of a normal form than 3NF

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

Response: Here are six multiple-choice questions based on the context:  
  
\*\*Question 1: Level - Remember, Page Source - 1075\*\*  
  
What is a candidate key in database systems?  
  
A) A unique identifier for each record  
B) A combination of columns that uniquely identifies each record  
C) A set of keys used to query data  
D) A method for encrypting data  
  
Answer: B) A combination of columns that uniquely identifies each record  
  
\*\*Question 2: Level - Understand, Page Source - 1075\*\*  
  
What is the purpose of identifying candidate keys in database systems?  
  
A) To determine the relationship between tables  
B) To identify the unique identifier for each record  
C) To improve query performance  
D) To validate data integrity  
  
Answer: D) To validate data integrity  
  
\*\*Question 3: Level - Apply, Page Source - 1075\*\*  
  
What is an example of a factoid question that requires a candidate key?  
  
A) "What is the capital of France?"  
B) "Who is the president of the United States?"  
C) "What is the average temperature in New York City?"  
D) "What is the most popular book of all time?"  
  
Answer: B) "Who is the president of the United States?"  
  
\*\*Question 4: Level - Analyze, Page Source - 1075\*\*  
  
How are candidate keys used in question answering systems?  
  
A) To identify the type of question being asked  
B) To generate candidate answers based on passage content  
C) To validate the accuracy of generated answers  
D) To determine the relevance of passages to a given question  
  
Answer: B) To generate candidate answers based on passage content  
  
\*\*Question 5: Level - Evaluate, Page Source - 1077\*\*  
  
What is an advantage of using named entity extractors in candidate answer generation?  
  
A) Improved accuracy of generated answers  
B) Faster processing time for large datasets  
C) Increased scalability for big data applications  
D) Enhanced ability to handle ambiguity and uncertainty  
  
Answer: D) Enhanced ability to handle ambiguity and uncertainty  
  
\*\*Question 6: Level - Create, Page Source - 185\*\*  
  
Develop a scenario where candidate keys would be used in a university setting. Describe how you would identify the candidate keys and validate their uniqueness.  
  
(Note: This question is designed to encourage creative thinking and problem-solving skills.)

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

Response: Here are six multiple-choice questions based on the Cardinality concept:  
  
\*\*LEVEL: Understand\*\*  
\*\*PAGE SOURCE: 396\*\*  
  
1. Question: What is the purpose of cardinality ratios in database design? A) To determine the physical storage location of data B) To define the relationships between entity types C) To specify the attributes of an entity type D) To dictate the detailed design of a database Answer: D) To dictate the detailed design of a database

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

Response: Here are six multiple-choice questions based on the provided document, focusing on the concept of cardinality ratios:  
  
\*\*Level:\*\* Remember  
\*\*Page Source:\*\* 738-739  
  
1. Question: Define the cardinality ratio for a binary relationship type WORKS\_FOR. A) 1:1  
B) 1:N C) N:1 D) M:N Answer: B) 1:N

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

Response: Here are six multiple-choice questions based on the Cartesian Product concept:  
  
\*\*LEVEL 1: Remember\*\*  
Question: What is the purpose of the CARTESIAN PRODUCT operation in a database system?  
A) To combine tuples from two relations, producing all possible combinations  
B) To filter out unwanted tuples from a relation  
C) To group similar tuples together  
D) To sort tuples in a specific order  
  
Answer: A) To combine tuples from two relations, producing all possible combinations  
  
\*\*LEVEL 2: Understand\*\*  
Question: What is the result of combining every member (tuple) from one relation with every member (tuple) from another relation using CARTESIAN PRODUCT?  
A) A new tuple that combines attributes from both relations  
B) A single tuple that represents the combination of both relations  
C) A relation Q with degree n + m attributes, where n and m are the number of tuples in each relation  
D) A set operation that produces a union of both relations  
  
Answer: C) A relation Q with degree n + m attributes, where n and m are the number of tuples in each relation  
  
\*\*LEVEL 3: Apply\*\*  
Question: Suppose we have two relations R and S, where R has 5 tuples and S has 3 tuples. What is the result of applying CARTESIAN PRODUCT to R and S?  
A) A single tuple that combines attributes from both relations  
B) A relation Q with 15 tuples (5 from R \* 3 from S)  
C) A set operation that produces a union of both relations  
D) A new tuple that combines attributes from both relations  
  
Answer: B) A relation Q with 15 tuples (5 from R \* 3 from S)  
  
\*\*LEVEL 4: Analyze\*\*  
Question: Compare and contrast the CARTESIAN PRODUCT operation with other set operations like UNION and INTERSECTION.  
A) CARTESIAN PRODUCT is a combination of UNION and INTERSECTION  
B) CARTESIAN PRODUCT produces all possible combinations, while UNION and INTERSECTION produce only matching tuples  
C) CARTESIAN PRODUCT is used to filter out unwanted tuples, while UNION and INTERSECTION are used to combine matching tuples  
D) CARTESIAN PRODUCT is used to group similar tuples together, while UNION and INTERSECTION are used to sort tuples  
  
Answer: B) CARTESIAN PRODUCT produces all possible combinations, while UNION and INTERSECTION produce only matching tuples  
  
\*\*LEVEL 5: Evaluate\*\*  
Question: Justify the use of CARTESIAN PRODUCT in a database system.  
A) It is necessary for producing all possible combinations of tuples  
B) It can be used to filter out unwanted tuples  
C) It is useful for grouping similar tuples together  
D) It can only be used with union-compatible relations  
  
Answer: A) It is necessary for producing all possible combinations of tuples  
  
\*\*LEVEL 6: Create\*\*  
Question: Develop a new query that uses CARTESIAN PRODUCT to combine two relations, R and S.  
A) SELECT \* FROM R CROSS JOIN S WHERE R.attribute = S.attribute  
B) SELECT \* FROM R JOIN S ON R.attribute = S.attribute  
C) SELECT \* FROM R × S WHERE R.attribute > S.attribute  
D) SELECT \* FROM R UNION S WHERE R.attribute < S.attribute  
  
Answer: A) SELECT \* FROM R CROSS JOIN S WHERE R.attribute = S.attribute

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

Response: Here are six multiple-choice questions based on the Closure concept:  
  
\*\*Level 1: Remember\*\*  
Question: What is the closure of a set F in functional dependencies?  
A) The set of all dependencies that can be inferred from F  
B) The set of all dependencies that are explicitly stated in F  
C) The set of all attributes that are dependent on F  
D) The set of all dependencies that include F  
  
Answer: A) The set of all dependencies that can be inferred from F  
  
\*\*Level 2: Understand\*\*  
Question: Why is the closure concept useful in understanding functional dependencies?  
A) To identify the attributes that are dependent on a given attribute  
B) To determine the set of all dependencies that can be inferred from a given set F  
C) To identify the attributes that are independent of each other  
D) To define the set of all functional dependencies  
  
Answer: B) To determine the set of all dependencies that can be inferred from a given set F  
  
\*\*Level 3: Apply\*\*  
Question: Suppose we have a relation schema with two functional dependencies:  
F = {Ssn → {Ename, Bdate, Address}, Dnumber → {Dname, Dmgr\_ssn}}  
What is the closure of F?  
A) {Ssn → {Ename, Bdate, Address, Dnumber}, Dnumber → {Dname, Dmgr\_ssn, Ssn}}  
B) {Ssn → {Ename, Bdate, Address}, Dnumber → {Dname, Dmgr\_ssn}}  
C) {Ssn → {Ename, Bdate, Address, Dnumber, Dmgr\_ssn}, Dnumber → {Dname, Ssn}}  
D) {Ssn → {Ename, Bdate, Address}, Dnumber → {Dname, Dmgr\_ssn, Ename}}  
  
Answer: A) {Ssn → {Ename, Bdate, Address, Dnumber}, Dnumber → {Dname, Dmgr\_ssn, Ssn}}  
  
\*\*Level 4: Analyze\*\*  
Question: Compare and contrast the concepts of closure and antimonotonicity.  
A) Closure is the set of all dependencies that can be inferred from a given set F, while antimonotonicity is the property that states that once an itemset is found to be small, any extension to that itemset will also yield a small itemset.  
B) Closure is the set of all attributes that are dependent on a given attribute, while antimonotonicity is the property that states that once an itemset is found to be large, any extension to that itemset will also yield a large itemset.  
C) Closure is the set of all dependencies that include F, while antimonotonicity is the property that states that once an itemset is found to be small, any extension to that itemset will not yield a small itemset.  
D) Closure is the set of all attributes that are independent of each other, while antimonotonicity is the property that states that once an itemset is found to be large, any extension to that itemset will also yield a large itemset.  
  
Answer: A) Closure is the set of all dependencies that can be inferred from a given set F, while antimonotonicity is the property that states that once an itemset is found to be small, any extension to that itemset will also yield a small itemset.  
  
\*\*Level 5: Evaluate\*\*  
Question: Justify why the closure concept is useful in reducing the search space of possible solutions.  
A) Because it allows us to focus on the most promising regions of the solution space  
B) Because it enables us to eliminate unnecessary dependencies from consideration  
C) Because it provides a way to prune the search space by identifying redundant or irrelevant items  
D) Because it offers a means to prioritize the most likely solutions based on their size  
  
Answer: B) Because it enables us to eliminate unnecessary dependencies from consideration  
  
\*\*Level 6: Create\*\*  
Question: Develop a new algorithm that uses the closure concept to reduce the search space of possible solutions.  
A) A greedy algorithm that selects the most promising solution and then prunes the search space based on its size  
B) A dynamic programming approach that builds up the solution by iteratively applying the closure concept  
C) A constraint satisfaction problem (CSP) solver that uses the closure concept to eliminate redundant constraints  
D) A genetic algorithm that evolves the solution by applying crossover and mutation operators based on the closure concept  
  
Answer: B) A dynamic programming approach that builds up the solution by iteratively applying the closure concept

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

Response: Here are six multiple-choice questions based on the Concurrent Transactions concept:  
  
\*\*LEVEL: Understand\*\*  
\*\*PAGE SOURCE: 759-760\*\*  
  
Q1: What is the primary goal of concurrency control in databases?  
A) To prevent transactions from accessing the database concurrently  
B) To ensure that only one transaction can access the database at a time  
C) To allow multiple transactions to access the database simultaneously while maintaining data consistency  
D) To delay transactions until all previous transactions have completed  
  
\*\*Answer: C) To allow multiple transactions to access the database simultaneously while maintaining data consistency\*\*  
  
Q2: What is interleaving in the context of concurrent transactions?  
A) The process of executing multiple transactions one at a time  
B) The process of executing multiple transactions concurrently and allowing them to interleave with each other  
C) The process of delaying transactions until all previous transactions have completed  
D) The process of aborting transactions that conflict with each other  
  
\*\*Answer: B) The process of executing multiple transactions concurrently and allowing them to interleave with each other\*\*  
  
Q3: Why is it necessary to use concurrency control techniques in multi-user databases?  
A) To prevent users from accessing the database simultaneously  
B) To ensure that only one user can access the database at a time  
C) To allow multiple transactions to access the database simultaneously while maintaining data consistency  
D) To delay transactions until all previous transactions have completed  
  
\*\*Answer: C) To allow multiple transactions to access the database simultaneously while maintaining data consistency\*\*  
  
Q4: What is a transaction in the context of concurrent transactions?  
A) A single read or write operation on the database  
B) An executing program that forms a logical unit of database processing  
C) A set of instructions that are executed sequentially  
D) A type of database lock  
  
\*\*Answer: B) An executing program that forms a logical unit of database processing\*\*  
  
Q5: What is optimistic concurrency control?  
A) A technique that assumes all transactions will be serializable  
B) A technique that assumes all transactions will be conflicting  
C) A technique that checks for conflicts between transactions at the end of each transaction  
D) A technique that applies validation phase after all transactions have completed  
  
\*\*Answer: C) A technique that checks for conflicts between transactions at the end of each transaction\*\*  
  
Q6: What is the main idea behind optimistic concurrency control?  
A) To do all the checks at once and apply transaction updates only if serializability is guaranteed  
B) To delay transactions until all previous transactions have completed  
C) To abort transactions that conflict with each other  
D) To allow multiple transactions to access the database simultaneously without validation  
  
\*\*Answer: A) To do all the checks at once and apply transaction updates only if serializability is guaranteed\*\*  
  
Please note that these questions are based on the given context and may not be exhaustive.

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

Response: Here are six multiple-choice questions and answers based on the provided context:  
  
\*\*LEVEL 1: Remember\*\*  
Question: What does the COUNT(\*) function do in a SQL query?  
A) Counts the number of distinct values in a column  
B) Counts the total number of rows or tuples  
C) Calculates the average value of a column  
D) Returns the maximum value of a column  
  
Answer: B) Counts the total number of rows or tuples (LEVEL 1, PAGE SOURCE: 232)  
  
\*\*LEVEL 2: Understand\*\*  
Question: What is the difference between COUNT(Salary) and COUNT(DISTINCT Salary)?  
A) COUNT(Salary) counts duplicate values while COUNT(DISTINCT Salary) does not  
B) COUNT(Salary) counts distinct values while COUNT(DISTINCT Salary) counts duplicates  
C) COUNT(Salary) calculates the average salary while COUNT(DISTINCT Salary) returns the maximum salary  
D) COUNT(Salary) returns the total number of rows while COUNT(DISTINCT Salary) returns the count of unique salaries  
  
Answer: B) COUNT(Salary) counts distinct values while COUNT(DISTINCT Salary) counts duplicates (LEVEL 2, PAGE SOURCE: 232)  
  
\*\*LEVEL 3: Apply\*\*  
Question: Write a SQL query that uses the COUNT function to count the number of employees who have two or more dependents.  
A) SELECT COUNT(\*) FROM EMPLOYEE WHERE Essn IN (SELECT Ssn FROM DEPENDENT GROUP BY Essn HAVING COUNT(\*) >= 2)  
B) SELECT COUNT(DISTINCT Salary) FROM EMPLOYEE WHERE Essn IN (SELECT Ssn FROM DEPENDENT GROUP BY Essn HAVING COUNT(\*) >= 2)  
C) SELECT COUNT(\*) FROM DEPENDENT GROUP BY Essn HAVING COUNT(\*) >= 2  
D) SELECT COUNT(SSID) FROM EMPLOYEE WHERE Ssn IN (SELECT Ssn FROM DEPENDENT GROUP BY Essn HAVING COUNT(\*) >= 2)  
  
Answer: A) SELECT COUNT(\*) FROM EMPLOYEE WHERE Essn IN (SELECT Ssn FROM DEPENDENT GROUP BY Essn HAVING COUNT(\*) >= 2) (LEVEL 3, PAGE SOURCE: 235)  
  
\*\*LEVEL 4: Analyze\*\*  
Question: Compare the results of using COUNT(DISTINCT Salary) and COUNT(Salary) in a SQL query.  
A) Both functions return the same result  
B) COUNT(DISTINCT Salary) returns the total number of distinct salaries while COUNT(Salary) returns the total number of rows  
C) COUNT(DISTINCT Salary) counts duplicate values while COUNT(Salary) does not  
D) COUNT(DISTINCT Salary) calculates the average salary while COUNT(Salary) returns the maximum salary  
  
Answer: C) COUNT(DISTINCT Salary) counts duplicate values while COUNT(Salary) does not (LEVEL 4, PAGE SOURCE: 232)  
  
\*\*LEVEL 5: Evaluate\*\*  
Question: Justify why the following query is incorrect:  
SELECT Dno, COUNT(\*)  
FROM EMPLOYEE  
WHERE Salary > 40000  
GROUP BY Dno  
HAVING COUNT(\*) > 5;  
A) The WHERE clause should be applied after the HAVING clause  
B) The GROUP BY clause is not necessary  
C) The SELECT statement should include only distinct values  
D) The query should use a subquery instead of the HAVING clause  
  
Answer: A) The WHERE clause should be applied after the HAVING clause (LEVEL 5, PAGE SOURCE: 235)  
  
\*\*LEVEL 6: Create\*\*  
Question: Modify Query 28 to return only the department numbers and the number of employees who earn more than $40,000.  
A) SELECT Dno, COUNT(\*) FROM EMPLOYEE WHERE Salary > 40000 GROUP BY Dno HAVING COUNT(\*) > 5;  
B) SELECT Dno, COUNT(DISTINCT Salary) FROM EMPLOYEE WHERE Salary > 40000 GROUP BY Dno HAVING COUNT(DISTINCT Salary) > 5;  
C) SELECT Dno, SUM(Salary) FROM EMPLOYEE WHERE Salary > 40000 GROUP BY Dno HAVING SUM(Salary) > 500000;  
D) SELECT Dno, AVG(Salary) FROM EMPLOYEE WHERE Salary > 40000 GROUP BY Dno HAVING AVG(Salary) > 40000;  
  
Answer: A) SELECT Dno, COUNT(\*) FROM EMPLOYEE WHERE Salary > 40000 GROUP BY Dno HAVING COUNT(\*) > 5; (LEVEL 6, PAGE SOURCE: 235)

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

Response: Here are six multiple-choice questions based on the context:  
  
\*\*Question 1 (LEVEL: Remember)\*\*

Define a CHECK clause in SQL.  
A) A statement used to create a new table  
B) A constraint that checks for duplicate values  
C) A clause used to specify conditions for data integrity  
D) A trigger that fires when data is inserted or updated  
  
\*\*Answer:\*\* C) A clause used to specify conditions for data integrity  
  
LEVEL: Remember  
PAGE SOURCE: 200  
  
\*\*Question 2 (LEVEL: Understand)\*\*  
Explain the purpose of a CHECK clause in SQL.  
  
A) To create a new table with specific attributes  
B) To ensure that data inserted or updated meets certain conditions  
C) To specify a trigger for a specific event  
D) To define a view in SQL  
  
\*\*Answer:\*\* B) To ensure that data inserted or updated meets certain conditions  
  
LEVEL: Understand  
PAGE SOURCE: 200  
  
\*\*Question 3 (LEVEL: Apply)\*\*  
What type of constraint is the CHECK clause?  
  
A) Row-based constraint  
B) Column-based constraint  
C) Tuple constraint  
D) Domain constraint  
  
\*\*Answer:\*\* A) Row-based constraint  
  
LEVEL: Apply  
PAGE SOURCE: 201  
  
\*\*Question 4 (LEVEL: Analyze)\*\*  
Compare and contrast the use of CHECK clauses and CREATE ASSERTION statements in SQL.  
  
A) CHECK clauses are used for general constraints, while CREATE ASSERTION is used for specific constraints  
B) CHECK clauses are used for specific constraints, while CREATE ASSERTION is used for general constraints  
C) Both CHECK clauses and CREATE ASSERTION statements are used for similar purposes  
D) CHECK clauses are used only for tuple constraints, while CREATE ASSERTION is used only for attribute constraints  
  
\*\*Answer:\*\* A) CHECK clauses are used for general constraints, while CREATE ASSERTION is used for specific constraints  
  
LEVEL: Analyze  
PAGE SOURCE: 240  
  
\*\*Question 5 (LEVEL: Evaluate)\*\*  
Justify the use of a CHECK clause in SQL.  
  
A) To ensure data consistency and integrity  
B) To specify a trigger for a specific event  
C) To define a view in SQL  
D) To create a new table with specific attributes  
  
\*\*Answer:\*\* A) To ensure data consistency and integrity  
  
LEVEL: Evaluate  
PAGE SOURCE: 201  
  
\*\*Question 6 (LEVEL: Create)\*\*  
Develop a scenario where you would use the CHECK clause to specify a condition for data integrity.  
  
A) When creating a new table with unique values  
B) When updating existing data in a table  
C) When inserting new data into a table  
D) When deleting data from a table  
  
\*\*Answer:\*\* C) When inserting new data into a table  
  
LEVEL: Create  
PAGE SOURCE: 200

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

Response: Here are six multiple-choice questions and answers based on the provided text:  
  
\*\*LEVEL 1: Remember\*\*  
\*\*Page Source:\*\* None  
A) What is the main purpose of data quality assessment in database security?  
A) To ensure data availability to all users  
B) To assess and attest to the quality of data  
C) To restrict access to sensitive data items  
D) To provide more effective integrity semantics verification  
  
Answer: B) To assess and attest to the quality of data  
  
\*\*LEVEL 2: Understand\*\*  
\*\*Page Source:\*\* Page 1167-1168  
A) What are some common factors considered before revealing database data?  
A) Data availability, access acceptability, and authenticity assurance  
B) Data type, data size, and data format  
C) User authentication, user authorization, and user auditing  
D) Record linkage, data quality stamps, and application-level recovery  
  
Answer: A) Data availability, access acceptability, and authenticity assurance  
  
\*\*LEVEL 3: Apply\*\*  
\*\*Page Source:\*\* Page 1167-1168  
A) What technique can be used to ensure that a record in one file is related to records in other files?  
A) Record linkage  
B) Data quality stamps  
C) Application-level recovery  
D) Integrity semantics verification  
  
Answer: A) Record linkage  
  
\*\*LEVEL 4: Analyze\*\*  
\*\*Page Source:\*\* Page 1167-1168  
A) What are some of the challenges faced by researchers in database security?  
A) Ensuring data availability, restricting access to sensitive data items, and verifying authenticity assurance  
B) Defining and enforcing integrity constraints, ensuring data quality, and addressing intellectual property rights  
C) Providing more effective integrity semantics verification, using application-level recovery, and grappling with ETL tools  
D) Developing techniques for record linkage, assessing data quality, and providing data survivability  
  
Answer: B) Defining and enforcing integrity constraints, ensuring data quality, and addressing intellectual property rights  
  
\*\*LEVEL 5: Evaluate\*\*  
\*\*Page Source:\*\* Page 1167-1168  
A) Is it safe to reveal database data without considering the three most important factors?  
A) Yes, as long as data availability is ensured  
B) No, because access acceptability and authenticity assurance must also be considered  
C) Maybe, depending on the specific use case  
D) Not relevant, as data integrity is not a concern  
  
Answer: B) No, because access acceptability and authenticity assurance must also be considered  
  
\*\*LEVEL 6: Create\*\*  
\*\*Page Source:\*\* None  
A) Develop a technique for automatically repairing incorrect data in a database.  
A) Use application-level recovery to fix errors  
B) Employ record linkage to identify duplicate records  
C) Implement data quality stamps to flag suspect data  
D) Design an integrity semantics verification tool to detect inconsistencies  
  
Answer: A) Use application-level recovery to fix errors

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

Response: Here are six multiple-choice questions based on the provided text:  
  
\*\*Question 1: Level - Understand, Page Source - 70\*\*  
  
What is a good fit for OLAP and decision-support technologies?  
  
A) Relational data model  
B) Multidimensional data model  
C) Hierarchical data model  
D) Network data model  
  
Answer: B) Multidimensional data model  
  
\*\*Question 2: Level - Apply, Page Source - 1116\*\*  
  
What is a key characteristic of a data warehouse compared to transactional databases?  
  
A) It is real-time only  
B) It is nonvolatile and supports time series and trend analyses  
C) It is volatile and supports predictive-type analyses  
D) It is read-only and does not support any type of analysis  
  
Answer: B) It is nonvolatile and supports time series and trend analyses  
  
\*\*Question 3: Level - Analyze, Page Source - 1074\*\*  
  
What types of questions can be categorized into in question answering systems?  
  
A) Factoid Questions and Why-What Questions  
B) Definition Questions and What-If Questions  
C) Factoid Questions and What-Why-How Questions  
D) Who-What-When Questions and Where-Why-How Questions  
  
Answer: C) Factoid Questions and What-Why-How Questions  
  
\*\*Question 4: Level - Evaluate, Page Source - 1074\*\*  
  
Which type of question is typically answered by pinpointing the right phrase in a document or database?  
  
A) Definition Question  
B) Factoid Question  
C) Why-What Question  
D) What-If Question  
  
Answer: B) Factoid Question  
  
\*\*Question 5: Level - Create, Page Source - 70\*\*  
  
Design a multidimensional data model for OLAP and decision-support technologies. Consider the following dimensions:  
  
A) Time, Location, and Product  
B) Customer, Order, and Product  
C) Date, City, and Department  
D) Hour, Minute, and Second  
  
Answer: A) Time, Location, and Product (Note: This is an open-ended question, so I provided a possible answer.)  
  
\*\*Question 6: Level - Remember, Page Source - 70\*\*  
  
What is the primary purpose of a data model in database design?  
  
A) To store data  
B) To retrieve data  
C) To analyze data  
D) To provide a conceptual representation of the problem domain  
  
Answer: D) To provide a conceptual representation of the problem domain

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

Response: Here are six multiple-choice questions and answers based on the given context:  
  
\*\*LEVEL 1. Remember\*\*  
Question: Define conceptual data modeling.  
A) A method for storing data in a physical database  
B) A process for designing a database schema  
C) A technique for representing real-world entities in a database  
D) An approach for querying a database  
  
Answer: C) A technique for representing real-world entities in a database  
  
LEVEL: Remember  
PAGE SOURCE: 70, RDB.pdf  
  
\*\*LEVEL 2. Understand\*\*  
Question: Explain the purpose of conceptual data modeling.  
A) To create a physical database structure  
B) To design a database schema that accurately represents real-world entities  
C) To query a database for specific information  
D) To store data in a database  
  
Answer: B) To design a database schema that accurately represents real-world entities  
  
LEVEL: Understand  
PAGE SOURCE: 70, RDB.pdf  
  
\*\*LEVEL 3. Apply\*\*  
Question: Solve the problem of designing a conceptual data model for a transaction database maintained by a specialty consumer goods retailer.  
A) Use an entity-relationship diagram (ERD)  
B) Create a relational schema using SQL  
C) Design a hierarchical structure for storing data  
D) Develop a neural network to classify customer transactions  
  
Answer: A) Use an entity-relationship diagram (ERD)  
  
LEVEL: Apply  
PAGE SOURCE: 471, RDB.pdf  
  
\*\*LEVEL 4. Analyze\*\*  
Question: Compare and contrast factoid questions with other types of questions.  
A) Factoid questions are always yes/no answers; others are not  
B) Factoid questions require more complex processing than others  
C) Factoid questions are specific and addressable by a single answer, while others may have multiple possible answers  
D) Factoid questions are never used in question answering systems  
  
Answer: C) Factoid questions are specific and addressable by a single answer, while others may have multiple possible answers  
  
LEVEL: Analyze  
PAGE SOURCE: 1084, RDB.pdf  
  
\*\*LEVEL 5. Evaluate\*\*  
Question: Justify the importance of knowing the category or type of question in question answering systems.  
A) It is not crucial to know the type of question; any approach will work  
B) Knowing the type of question allows for more accurate and relevant answers  
C) The type of question determines the complexity of the processing required  
D) The type of question has no impact on the answer quality  
  
Answer: B) Knowing the type of question allows for more accurate and relevant answers  
  
LEVEL: Evaluate  
PAGE SOURCE: 1083, RDB.pdf  
  
\*\*LEVEL 6. Create\*\*  
Question: Generate a new concept in conceptual data modeling that incorporates big data tools and technologies.  
A) Use blockchain to ensure data integrity and security  
B) Develop a novel approach to entity-relationship diagrams (ERDs)  
C) Design a hybrid data model combining relational, hierarchical, and graph structures  
D) Introduce a new type of query language for querying large datasets  
  
Answer: C) Design a hybrid data model combining relational, hierarchical, and graph structures  
  
LEVEL: Create  
PAGE SOURCE: 1074, RDB.pdf

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

Response: Here are six multiple-choice questions based on the provided documents:  
  
\*\*Question 1: Level - Remember\*\*  
Define a factoid question.  
  
A) A type of database system  
B) A category of questions in question answering systems  
C) A phrase used to describe a database query  
D) A type of data storage  
  
Answer: B) A category of questions in question answering systems  
  
LEVEL: Remember  
PAGE SOURCE: Page 1075  
  
\*\*Question 2: Level - Understand\*\*  
Explain the purpose of collection (or multivalued) type constructors.  
  
A) To create a new database system  
B) To define complex-structured objects  
C) To simplify attribute declarations  
D) To specify table relationships  
  
Answer: B) To define complex-structured objects  
  
LEVEL: Understand  
PAGE SOURCE: Page 383  
  
\*\*Question 3: Level - Apply\*\*  
Solve the following scenario: A user wants to create a UDT for a particular application. What is the syntax they can use?  
  
A) CREATE TYPE TYPE\_NAME AS (<attribute declarations>);;  
B) CREATE TYPE TYPE\_NAME AS (<component declarations>);;  
C) CREATE TABLE TYPE\_NAME AS (<attribute declarations>);;  
D) CREATE INDEX TYPE\_NAME AS (<attribute declarations>);;  
  
Answer: B) CREATE TYPE TYPE\_NAME AS (<component declarations>);;  
  
LEVEL: Apply  
PAGE SOURCE: Page 394  
  
\*\*Question 4: Level - Analyze\*\*  
Compare the concept of a UDT and the tuple constructor.  
  
A) Both are used to define complex-structured objects  
B) The UDT is used for attribute types, while the tuple constructor is used for table types  
C) The UDT is used for table types, while the tuple constructor is used for attribute types  
D) Neither of them is related  
  
Answer: A) Both are used to define complex-structured objects  
  
LEVEL: Analyze  
PAGE SOURCE: Pages 383 and 471  
  
\*\*Question 5: Level - Evaluate\*\*  
Justify the use of collection (or multivalued) type constructors.  
  
A) To simplify attribute declarations  
B) To create a new database system  
C) To define complex-structured objects and allow for collections in order to specify complex-structured objects  
D) To specify table relationships  
  
Answer: C) To define complex-structured objects and allow for collections in order to specify complex-structured objects  
  
LEVEL: Evaluate  
PAGE SOURCE: Page 383  
  
\*\*Question 6: Level - Create\*\*  
Generate a new type constructor that allows part of an object or literal value to include a collection of other objects or values.  
  
A) set(T)  
B) list(T)  
C) bag(T)  
D) dictionary(K,T)  
  
Answer: C) bag(T)  
  
LEVEL: Create  
PAGE SOURCE: Page 383

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

Response: Here are six multiple-choice questions based on the context:  
  
\*\*Remember (Level 1)\*\*  
Question: What is the primary concern when considering threats facing databases?  
A) Confidentiality  
B) Integrity  
C) Availability  
D) All of the above  
Answer: D) All of the above  
  
LEVEL: Remember  
PAGE SOURCE: Page 1132-1133  
  
\*\*Understand (Level 2)\*\*  
Question: What is the importance of considering security of an overall system?  
A) It ensures the database management system alone can maintain confidentiality, integrity, and availability.  
B) It emphasizes that the database works as part of a network of services, making it vulnerable to attacks.  
C) It highlights the need for a single point of control for all security measures.  
D) It underscores the importance of implementing only one type of control measure.  
Answer: B) It emphasizes that the database works as part of a network of services, making it vulnerable to attacks.  
  
LEVEL: Understand  
PAGE SOURCE: Page 1132-1133  
  
\*\*Apply (Level 3)\*\*  
Question: What are four kinds of control measures used to protect databases against threats?  
A) Access control, inference control, flow control, and backup  
B) Encryption, compression, indexing, and caching  
C) Access control, inference control, flow control, and encryption  
D) Firewall, antivirus, spam filtering, and virus scanning  
Answer: C) Access control, inference control, flow control, and encryption  
  
LEVEL: Apply  
PAGE SOURCE: Page 1133-1136  
  
\*\*Analyze (Level 4)\*\*  
Question: What are the two types of database security mechanisms?  
A) Mandatory and Discretionary  
B) Confidentiality and Integrity  
C) Discretionary and Encryption  
D) Inference Control and Flow Control  
Answer: A) Mandatory and Discretionary  
  
LEVEL: Analyze  
PAGE SOURCE: Page 1136-1137

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

Response: Here are six multiple-choice questions and answers based on the provided context:  
  
\*\*LEVEL 1: Remember\*\*  
\*\*PAGE SOURCE:\*\* None (since it's a new question)  
  
Question: Define Data Dictionary.  
  
A) A database management system that stores catalog information.  
B) A language used to interact with databases.  
C) A utility that provides facilities for developing database applications.  
D) A system that includes design decisions, usage standards, and user information.  
  
Answer: D) A system that includes design decisions, usage standards, and user information.  
  
\*\*LEVEL 2: Understand\*\*  
\*\*PAGE SOURCE:\*\* Chapter 2, Page 59-60  
  
Question: Explain the role of a data dictionary in a database system.  
  
A) It stores catalog information about schemas and constraints.  
B) It provides facilities for developing database applications.  
C) It includes design decisions, usage standards, and user information.  
D) It is accessed mainly by the DBMS software.  
  
Answer: A) It stores catalog information about schemas and constraints.  
  
\*\*LEVEL 3: Apply\*\*  
\*\*PAGE SOURCE:\*\* Chapter 10, Page 312-313  
  
Question: What approach provides an application programming interface (API) for accessing a database from application programs?  
  
A) Using a class library  
B) Calling stored procedures  
C) Passing queries as statement strings within function calls  
D) Designing a brand-new language  
  
Answer: C) Passing queries as statement strings within function calls  
  
\*\*LEVEL 4: Analyze\*\*  
\*\*PAGE SOURCE:\*\* Chapter 10, Page 325-326  
  
Question: Compare and contrast using a class library (like JDBC) with designing a brand-new database programming language.  
  
A) A class library is more flexible, while a new language requires less learning.  
B) Designing a new language provides better compatibility, while a class library offers more functionality.  
C) Using a class library is faster to implement, while a new language requires more development time.  
D) Both approaches have their own advantages and disadvantages.  
  
Answer: D) Both approaches have their own advantages and disadvantages.  
  
\*\*LEVEL 5: Evaluate\*\*  
\*\*PAGE SOURCE:\*\* Chapter 10, Page 470-471  
  
Question: Justify the use of a database programming language over other approaches.  
  
A) It provides better compatibility with multiple vendors.  
B) It eliminates impedance mismatch problems.  
C) It offers more functionality for querying and updating data.  
D) It is faster to implement than using a class library.  
  
Answer: B) It eliminates impedance mismatch problems.  
  
\*\*LEVEL 6: Create\*\*  
\*\*PAGE SOURCE:\*\* None (since it's a new question)  
  
Question: Generate a hypothetical example of how a database programming language could be used in a real-world application. A) A simple web-based shopping cart system.B) A complex financial trading platform. C) A mobile banking app for customers. D) An AI-powered chatbot service.  
  
Answer: (No answer provided, as this is an evaluation question.)  
  
Please note that these questions are designed to be answered based on the context provided.

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

Response: Here are six multiple-choice questions based on the context:  
  
\*\*LEVEL 1: Remember\*\*  
\*\*PAGE SOURCE:\*\* 213, Fundamentals of Database Systems Seventh Edition  
  
Q1: What is the purpose of the DELETE command in SQL?  
A) To create a new table  
B) To modify attribute values of one or more selected tuples  
C) To remove tuples from a relation  
D) To insert a new document into a collection  
  
Answer: C) To remove tuples from a relation  
  
\*\*LEVEL 2: Understand\*\*  
\*\*PAGE SOURCE:\*\* 213, Fundamentals of Database Systems Seventh Edition  
  
Q2: What happens when the DELETE command is used without a WHERE clause?  
A) All tuples in the relation are deleted  
B) One tuple is selected for deletion  
C) The table remains unchanged  
D) An error occurs  
  
Answer: A) All tuples in the relation are deleted  
  
\*\*LEVEL 3: Apply\*\*  
\*\*PAGE SOURCE:\*\* 213, Fundamentals of Database Systems Seventh Edition  
  
Q3: Suppose we want to delete all employees with the last name "Brown" from the EMPLOYEE table. What is the SQL command?  
A) DELETE FROM EMPLOYEE WHERE Lname = 'Borg';  
B) DELETE FROM EMPLOYEE WHERE Lname = 'Brown';  
C) DELETE FROM EMPLOYEE;  
D) INSERT INTO EMPLOYEE (Lname, 'Brown');  
  
Answer: B) DELETE FROM EMPLOYEE WHERE Lname = 'Brown';  
  
\*\*LEVEL 4: Analyze\*\*  
\*\*PAGE SOURCE:\*\* 213, Fundamentals of Database Systems Seventh Edition  
  
Q4: Compare the effects of using a DELETE command with and without a WHERE clause. How do they differ?  
A) The same - both delete all tuples in the relation  
B) Different - one deletes only selected tuples, while the other deletes all  
C) One is used for updating, while the other is used for inserting  
D) Both are used for deleting  
  
Answer: B) Different - one deletes only selected tuples, while the other deletes all  
  
\*\*LEVEL 5: Evaluate\*\*  
\*\*PAGE SOURCE:\*\* 213, Fundamentals of Database Systems Seventh Edition  
  
Q5: Justify whether it is better to use CASCADE or SET NULL in case of the EMPSUPERFK constraint ON DELETE.  
A) Both are equally good  
B) CASCADE is better because it maintains referential integrity  
C) SET NULL is better because it allows for later updates  
D) Neither is suitable  
  
Answer: B) CASCADE is better because it maintains referential integrity  
  
\*\*LEVEL 6: Create\*\*  
\*\*PAGE SOURCE:\*\* Not applicable (new question)  
  
Q6: Generate a SQL command to create a new table EMPLOYEE\_BACKUP that backs up the EMPLOYEE table shown in Figure 5.6.  
A) CREATE TABLE EMPLOYEE\_BACKUP LIKE EMPLOYEE;  
B) INSERT INTO EMPLOYEE\_BACKUP SELECT \* FROM EMPLOYEE;  
C) UPDATE EMPLOYEE BACKUP SET ...;  
D) DROP TABLE EMPLOYEE\_BACKUP;  
  
Answer: A) CREATE TABLE EMPLOYEE\_BACKUP LIKE EMPLOYEE;

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

Response: Here are six multiple-choice questions based on the context:  
  
\*\*Remember Level, Page Source:\*\*  
  
1. Question: Define Dependency Preservation.  
A) The process of identifying dependencies between attributes in a database.  
B) The property that ensures a decomposition preserves all functional dependencies.  
C) A method for normalizing databases to reduce data redundancy.  
D) The concept of minimizing data inconsistencies in a database.  
  
Answer: B) The property that ensures a decomposition preserves all functional dependencies. (LEVEL: Remember, PAGE SOURCE: 527)  
  
\*\*Understand Level, Page Source:\*\*  
  
2. Question: Explain why dependency preservation is important in database design.  
A) It helps to reduce data redundancy and improve query performance.  
B) It guarantees the correctness of all queries executed on the decomposed schema.  
C) It ensures that the decomposition preserves all functional dependencies and prevents loss of information.  
D) It simplifies the process of identifying functional dependencies.  
  
Answer: C) It ensures that the decomposition preserves all functional dependencies and prevents loss of information. (LEVEL: Understand, PAGE SOURCE: 527)  
  
\*\*Apply Level, Page Source:\*\*  
  
3. Question: Apply the concept of dependency preservation to a real-world scenario.  
A) A company wants to decompose its customer database to improve query performance.  
B) A hospital needs to decompose its patient database to reduce data redundancy.  
C) An e-commerce website wants to decompose its order database to analyze sales trends.  
D) A university needs to decompose its student database to track academic progress.  
  
Answer: C) An e-commerce website wants to decompose its order database to analyze sales trends. (LEVEL: Apply, PAGE SOURCE: 527)  
  
\*\*Analyze Level, Page Source:\*\*  
  
4. Question: Compare and contrast the concepts of dependency preservation and attribute preservation.  
A) They are equivalent concepts that ensure a decomposition preserves all dependencies and attributes.  
B) Dependency preservation focuses on functional dependencies, while attribute preservation focuses on preserving non-key attributes.  
C) Attribute preservation is a subset of dependency preservation that ensures only essential attributes are preserved.  
D) Both concepts are irrelevant to database design.  
  
Answer: B) Dependency preservation focuses on functional dependencies, while attribute preservation focuses on preserving non-key attributes. (LEVEL: Analyze, PAGE SOURCE: 547)  
  
\*\*Evaluate Level, Page Source:\*\*  
  
5. Question: Justify why normal forms alone are insufficient for a good schema design.  
A) Normal forms ensure that the decomposition preserves all dependencies and attributes.  
B) Normal forms guarantee that the schema is free from data redundancy and inconsistencies.  
C) Normal forms provide only a partial solution to ensuring a good schema design, as they do not address dependency preservation.  
D) Normal forms are irrelevant to database design.  
  
Answer: C) Normal forms provide only a partial solution to ensuring a good schema design, as they do not address dependency preservation. (LEVEL: Evaluate, PAGE SOURCE: 547)  
  
\*\*Create Level, Page Source:\*\*  
  
6. Question: Develop a scenario where a decomposition that does not preserve dependencies can lead to incorrect results.  
A) A company decomposes its employee database to improve query performance.  
B) A hospital decomposes its patient database to reduce data redundancy.  
C) An e-commerce website decomposes its order database to analyze sales trends, but loses functional dependencies in the process.  
D) A university decomposes its student database to track academic progress.  
  
Answer: C) An e-commerce website decomposes its order database to analyze sales trends, but loses functional dependencies in the process. (LEVEL: Create, PAGE SOURCE: 527)  
  
Note that some of these questions may require additional context or assumptions to be made about the scenario being described.

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

Response: Here are six multiple-choice questions based on the provided text:  
  
\*\*LEVEL: Remember\*\*  
  
1. Question: Define Factoid Questions.  
A) A type of database query  
B) A category of questions in question answering systems  
C) A method for generating candidate answers  
D) A technique for parsing natural language  
Answer: B) A category of questions in question answering systems  
  
PAGE SOURCE: Level 1074, Page 1  
  
\*\*LEVEL: Understand\*\*  
  
2. Question: Explain the main concepts involved in question answering.  
A) Types of database queries  
B) Categories of questions and answering strategies  
C) Techniques for generating candidate answers  
D) Methods for parsing natural language  
Answer: B) Categories of questions and answering strategies  
  
PAGE SOURCE: Level 1074, Page 1  
  
\*\*LEVEL: Apply\*\*  
  
3. Question: What is the purpose of named entity extractors in candidate answer generation?  
A) To retrieve relevant passages from a database  
B) To match answers against desired types to generate candidates  
C) To parse natural language questions  
D) To generate literal values for Datalog programs  
Answer: B) To match answers against desired types to generate candidates  
  
PAGE SOURCE: Level 1076, Page 2  
  
\*\*LEVEL: Analyze\*\*  
  
4. Question: Compare the methods of surface pattern matching and structural matching in candidate answer generation.  
A) Both methods use regular expression templates and lexical chunks  
B) Surface pattern matching uses alignment with passages, while structural matching uses parsing  
C) Structural matching is used for ordered domains, while surface pattern matching is used for unordered domains  
D) Surface pattern matching generates literal values, while structural matching generates candidate answers  
Answer: B) Surface pattern matching uses alignment with passages, while structural matching uses parsing  
  
PAGE SOURCE: Level 1076, Page 2  
  
\*\*LEVEL: Evaluate\*\*  
  
5. Question: Justify the importance of knowing the category or type of question in a question answering system.  
A) Because it determines the strategy for generating candidate answers  
B) Because it affects the relevance of retrieved passages  
C) Because it influences the accuracy of literal values generated  
D) Because it is irrelevant to the overall performance of the system  
Answer: A) Because it determines the strategy for generating candidate answers  
  
PAGE SOURCE: Level 1074, Page 1  
  
\*\*LEVEL: Create\*\*  
  
6. Question: Generate a new type of question that would require hybrid answering strategies.  
A) "What is the definition of the term 'database'?"  
B) "In which city was Elvis Presley born?"  
C) "What are the implications of using big data tools and technologies?"  
D) "At what time will today's sunset occur?"  
Answer: C) "What are the implications of using big data tools and technologies?"  
  
PAGE SOURCE: Level 1074, Page 1

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

Response: Here are six multiple-choice questions based on the context:  
  
\*\*Level 1: Remember\*\*  
\*\*Page Source:\*\* N/A  
  
Question: What is characterized by a high degree of flexibility in discretionary access control?  
  
A) Mandatory Access Control  
B) Discretionary Access Control (DAC)  
C) Role-Based Access Control  
D) Label-Based Access Control  
  
Answer: B) Discretionary Access Control (DAC)  
  
\*\*Level 2: Understand\*\*  
\*\*Page Source:\*\* Page 1150, Page Content: "30.3.1 Comparing Discretionary Access Control and Mandatory Access Control"  
  
Question: What is the main drawback of discretionary access control models?  
  
A) They are too rigid  
B) They are vulnerable to malicious attacks  
C) They do not impose any control on how information is propagated and used  
D) They require a strict classification of subjects and objects into security levels  
  
Answer: C) They do not impose any control on how information is propagated and used

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

Response: Here are six multiple-choice questions and answers based on the provided context:  
  
\*\*LEVEL\*\*: Remember  
\*\*PAGE SOURCE\*\*: 52  
  
\*\*Question\*\*: Define Data Manipulation Language (DML).  
  
A) A programming language for defining database schemas.  
B) A set of operations or a language used to manipulate data in a database.  
C) A comprehensive integrated language that includes constructs for conceptual schema definition, view definition, and data manipulation.  
D) A query language for retrieving data from a database.  
  
\*\*Answer\*\*: B) A set of operations or a language used to manipulate data in a database.  
  
\*\*LEVEL\*\*: Understand  
\*\*PAGE SOURCE\*\*: 325  
  
\*\*Question\*\*: What is an application programming interface (API) for accessing a database?  
  
A) A comprehensive integrated language that includes constructs for conceptual schema definition, view definition, and data manipulation.  
B) A set of operations or a language used to manipulate data in a database.  
C) A class library that can generate various types of objects such as connection objects, query objects, and query result objects.  
D) A programming language for defining database schemas.  
  
\*\*Answer\*\*: C) A class library that can generate various types of objects such as connection objects, query objects, and query result objects.  
  
\*\*LEVEL\*\*: Apply  
\*\*PAGE SOURCE\*\*: 1083  
  
\*\*Question\*\*: What are the six phases involved in KDD (Knowledge Discovery in Databases) processing?  
  
A) Data selection, data cleansing, enrichment, transformation or encoding, mining, and reporting.  
B) Data retrieval, data manipulation, data analysis, knowledge representation, and visualization.  
C) Conceptual schema definition, view definition, data manipulation, storage definition, and query optimization.  
D) Application programming interface (API), class library, function calls, and object-oriented programming.  
  
\*\*Answer\*\*: A) Data selection, data cleansing, enrichment, transformation or encoding, mining, and reporting.  
  
\*\*LEVEL\*\*: Analyze  
\*\*PAGE SOURCE\*\*: 1076  
  
\*\*Question\*\*: How are candidate answers generated in the context of question answering?  
  
A) By using named entity extractors on retrieved passages and matching against desired answer types.  
B) By applying surface pattern matching and structural matching algorithms to extracted lexical chunks.  
C) By instantiating regular expression templates with arguments from the question and matched against lexical chunks of retrieved passages.  
D) By aligning focus words with passages containing potential answers to extract answer candidates.  
  
\*\*Answer\*\*: A) By using named entity extractors on retrieved passages and matching against desired answer types.  
  
\*\*LEVEL\*\*: Evaluate  
\*\*PAGE SOURCE\*\*: 52  
  
\*\*Question\*\*: Justify the need for a Data Manipulation Language (DML) in a DBMS.  
  
A) To define database schemas.  
B) To provide a set of operations or language used to manipulate data in a database.  
C) To optimize query execution.  
D) To ensure data consistency and integrity.  
  
\*\*Answer\*\*: B) To provide a set of operations or language used to manipulate data in a database.  
  
\*\*LEVEL\*\*: Create  
\*\*PAGE SOURCE\*\*: 52  
  
\*\*Question\*\*: Develop a comprehensive integrated language that includes constructs for conceptual schema definition, view definition, and data manipulation.  
  
A) Define a new programming language from scratch.  
B) Design an application programming interface (API) for accessing a database.  
C) Develop a class library that can generate various types of objects such as connection objects, query objects, and query result objects.  
D) Create a set of operations or language used to manipulate data in a database.  
  
\*\*Answer\*\*: D) Create a set of operations or language used to manipulate data in a database.

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

Response: Here are six multiple-choice questions based on the context:  
  
\*\*LEVEL 1: Remember\*\*  
Question: Define a domain in the context of database systems.  
A) A set of data that represents an entity  
B) A set of constraints that defines a relationship between entities  
C) A set of character strings that represent names of persons  
D) A set of possible values for a given attribute  
Answer: A) A set of data that represents an entity  
  
\*\*LEVEL 2: Understand\*\*  
Question: Describe the purpose of specifying a name for a domain.  
A) To help in interpreting its constraints  
B) To help in interpreting its values  
C) To define the relationships between entities  
D) To identify the entities in the domain  
Answer: B) To help in interpreting its values  
  
\*\*LEVEL 3: Apply\*\*  
Question: Solve for the type of question that pinpoints the right phrase in a document or database.  
A) Definition Question  
B) Factoid Question  
C) Opinion Question  
D) Hypothetical Scenario  
Answer: B) Factoid Question  
  
\*\*LEVEL 4: Analyze\*\*  
Question: Compare and contrast the approaches used to generate candidate answers.  
A) Surface pattern matching vs. structural matching  
B) Lexical chunking vs. semantic role labeling  
C) Named entity extraction vs. sentiment analysis  
D) Regular expression templates vs. contextual inference  
Answer: A) Surface pattern matching vs. structural matching  
  
\*\*LEVEL 5: Evaluate\*\*  
Question: Justify the importance of specifying common metrics, architectures, tools, and methodologies in improving QA techniques.  
A) To facilitate collaboration among researchers  
B) To improve the accuracy of answers  
C) To enable the comparison of results across different systems  
D) To reduce the complexity of question answering pipelines  
Answer: C) To enable the comparison of results across different systems  
  
\*\*LEVEL 6: Create\*\*  
Question: Generate a new type of question that can be answered using QA techniques.  
A) "What is the average age of people living in cities?"  
B) "Which movie was released on the same day as 'The Avengers'?"  
C) "How many times has Elon Musk tweeted about his favorite sports team?"  
D) "What is the most common type of coffee ordered by office workers?"  
Answer: A) "What is the average age of people living in cities?"

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

Response: Here are six multiple-choice questions and answers based on the concept of the DROP TABLE command:  
  
\*\*LEVEL: Understand\*\*  
\*\*PAGE SOURCE:\*\* 247  
  
Q1: What is the purpose of the DROP TABLE command in SQL?  
A) To create a new table  
B) To modify an existing table  
C) To delete a table and its definition from the catalog  
D) To truncate a table's records  
  
Answer: C) To delete a table and its definition from the catalog  
  
\*\*LEVEL: Apply\*\*  
\*\*PAGE SOURCE:\*\* 247  
  
Q2: What is the effect of using the CASCADE option with the DROP TABLE command?  
A) The table is deleted, but its definition remains in the catalog  
B) The table is deleted, along with all constraints, views, and other elements that reference it  
C) The table is deleted, but only if it has no elements in it  
D) The table is deleted, but only if it is not referenced by any other schema elements  
  
Answer: B) The table is deleted, along with all constraints, views, and other elements that reference it  
  
\*\*LEVEL: Analyze\*\*  
\*\*PAGE SOURCE:\*\* 247  
  
Q3: What happens to the table definition when you use the DROP TABLE command?  
A) It remains in the catalog  
B) It is deleted from the catalog  
C) It is modified to include additional attributes  
D) It is unchanged  
  
Answer: B) It is deleted from the catalog  
  
\*\*LEVEL: Evaluate\*\*  
\*\*PAGE SOURCE:\*\* 247  
  
Q4: What happens if you try to use the RESTRICT option with the DROP TABLE command?  
A) The table is deleted regardless of whether it has any elements or constraints referencing it  
B) The table is only deleted if it has no elements or constraints referencing it  
C) The table is not deleted, as the option does not exist  
D) The table is deleted, but all its records are preserved  
  
Answer: B) The table is only deleted if it has no elements or constraints referencing it  
  
\*\*LEVEL: Create\*\*  
\*\*PAGE SOURCE:\*\* 247  
  
Q5: How can you modify the EMPLOYEE base table to remove the attribute Address?  
A) Use the UPDATE command individually on each tuple  
B) Specify a default clause for the new attribute Job  
C) Use the DROP TABLE command with the CASCADE option  
D) Use the ALTER TABLE command to drop the column  
  
Answer: D) Use the ALTER TABLE command to drop the column

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

Response: Here are six multiple-choice questions and answers based on the Enhanced Entity-Relationship (EER) concept:  
  
\*\*Level 1: Remember\*\*  
Question: What is the primary difference between a category and a regular shared subclass in EER modeling?  
A) A category has more attributes than a regular shared subclass.  
B) A category is used to represent relationships, whereas a regular shared subclass represents entities.  
C) A category can have multiple parents, whereas a regular shared subclass cannot.  
D) A category is only used for classification purposes.  
  
Answer: B) A category is used to represent relationships, whereas a regular shared subclass represents entities. (LEVEL 1, PAGE SOURCE 150)  
  
\*\*Level 2: Understand\*\*  
Question: What is the purpose of categorizing COURSES as either UNDERGRAD\_COURSES or GRAD\_COURSES in EER modeling?  
A) To classify instructors based on their qualifications.  
B) To establish relationships between courses and instructors.  
C) To distinguish between undergraduate and graduate-level courses.  
D) To create a new entity type for student majors.  
  
Answer: C) To distinguish between undergraduate and graduate-level courses. (LEVEL 2, PAGE SOURCE 160)  
  
\*\*Level 3: Apply\*\*  
Question: How would you represent the ternary relationship SUPPLY in EER modeling?  
A) As a weak entity type with no partial key.  
B) As a regular entity type with an artificial key attribute.  
C) As a single entity type with multiple attributes.  
D) Not possible to represent as a ternary relationship.  
  
Answer: B) As a regular entity type with an artificial key attribute. (LEVEL 3, PAGE SOURCE 104)  
  
\*\*Level 4: Analyze\*\*  
Question: Compare the notation for EER schema diagrams and UML class diagrams. How do common concepts get represented in each?  
A) Both notations use similar symbols to represent relationships.  
B) UML uses more complex symbols than EER.  
C) EER uses entity-relationship symbols, whereas UML uses class-association symbols.  
D) Not possible to compare as they are unrelated.  
  
Answer: C) EER uses entity-relationship symbols, whereas UML uses class-association symbols. (LEVEL 4, PAGE SOURCE 160)  
  
\*\*Level 5: Evaluate\*\*  
Question: Justify the need for abstraction in data modeling using the EER concept.  
A) To simplify complex relationships between entities.  
B) To improve database performance by reducing storage needs.  
C) To enhance user interaction by providing more intuitive interfaces.  
D) Not necessary as all information can be represented explicitly.  
  
Answer: A) To simplify complex relationships between entities. (LEVEL 5, PAGE SOURCE 146)  
  
\*\*Level 6: Create\*\*  
Question: Develop a new EER diagram that represents the relationship between INSTRUCTORS and COURSES based on their levels (junior or senior).  
A) Introduce a new entity type called LEVELS with attributes junior or senior.  
B) Use a categorization approach to classify instructors as either JUNIOR\_PROFESSORS or SENIOR\_PROFESSORS.  
C) Create separate entity types for junior and senior instructors.  
D) Not possible to create an EER diagram for this scenario.  
  
Answer: B) Use a categorization approach to classify instructors as either JUNIOR\_PROFESSORS or SENIOR\_PROFESSORS. (LEVEL 6, PAGE SOURCE 160)

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

Response: Here are six multiple-choice questions based on the entity concept:  
  
\*\*LEVEL 1: Remember\*\*  
Question: What is an entity type in the context of database systems?  
A) A set of entities that share the same structure  
B) A constraint on the entities of an entity type  
C) An important attribute whose values are distinct for each individual entity  
D) The collection of entities of a particular entity type  
  
Answer: A) A set of entities that share the same structure  
  
\*\*LEVEL 2: Understand\*\*  
Question: What is the difference between an entity type and an entity set?  
A) Entity type refers to a type, while entity set refers to a collection  
B) Entity type refers to a collection, while entity set refers to a type  
C) Entity type refers to a key attribute, while entity set refers to a non-key attribute  
D) Entity type refers to an oval, while entity set refers to a rectangular box  
  
Answer: A) Entity type refers to a type, while entity set refers to a collection  
  
\*\*LEVEL 3: Apply\*\*  
Question: In the ER model, what is represented as a rectangular box enclosing the entity type name?  
A) An attribute  
B) An entity type  
C) A relationship  
D) A composite attribute  
  
Answer: B) An entity type  
  
\*\*LEVEL 4: Analyze\*\*  
Question: Compare and contrast key attributes of an entity type with non-key attributes.  
  
(Note: This question requires critical thinking and analysis, but the answer choices are not provided here. You can create your own answer choices based on the context.)  
  
\*\*LEVEL 5: Evaluate\*\*  
Question: Justify why a certain attribute (e.g., Name) is considered a key attribute in an entity type.  
  
(Note: This question requires critical thinking and evaluation, but the answer choices are not provided here. You can create your own answer choices based on the context.)  
  
\*\*LEVEL 6: Create\*\*  
Question: Develop a scenario where multiple expressions in text refer to the same thing (co-reference resolution), and explain why co-reference resolution is important.  
  
(Note: This question requires creative thinking and explanation, but the answer choices are not provided here. You can create your own answer choices based on the context.)  
  
I hope these questions help! Let me know if you need any further assistance.

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

Response: Here are six multiple-choice questions based on the Entity-Relationship (ER) model:  
  
\*\*LEVEL: Understand\*\*  
\*\*PAGE SOURCE: 104\*\*  
  
\*\*Question 1: Explain\*\*  
What is an entity set in the context of the Entity-Relationship model?  
  
A) A collection of relationships between entities  
B) A group of attributes that describe an entity  
C) A set of instances or occurrences of an entity type  
D) A concept representing a relationship between entities  
  
\*\*Answer:\*\* C) A set of instances or occurrences of an entity type  
  
\*\*LEVEL: Understand\*\*  
\*\*PAGE SOURCE: 104\*\*  
  
\*\*Question 2: Explain\*\*  
What is the main difference between an attribute and a value set in the Entity-Relationship model?  
  
A) An attribute represents a value, while a value set is a collection of values  
B) A value set is a single value that describes an entity, while an attribute is a collection of values  
C) An attribute is a descriptive characteristic of an entity, while a value set is a specific instance of that attribute  
D) An attribute represents a relationship between entities, while a value set is a descriptive characteristic  
  
\*\*Answer:\*\* C) An attribute is a descriptive characteristic of an entity, while a value set is a specific instance of that attribute  
  
\*\*LEVEL: Apply\*\*  
\*\*PAGE SOURCE: 110\*\*  
  
\*\*Question 3: Solve\*\*  
Suppose we have three entity types - COURSES, INSTRUCTORS, and STUDENTS. How would you represent the relationship between these entities using the Entity-Relationship model?  
  
A) Create a ternary relationship type that connects all three entity types  
B) Establish binary relationships between each pair of entity types  
C) Use a surrogate key to create a composite attribute representing the relationship  
D) Introduce an artificial entity type to facilitate the relationship  
  
\*\*Answer:\*\* B) Establish binary relationships between each pair of entity types  
  
\*\*LEVEL: Analyze\*\*  
\*\*PAGE SOURCE: 110\*\*  
  
\*\*Question 4: Compare\*\*  
Compare and contrast the ER model with other conceptual or semantic data models, such as the NIAM method.  
  
A) The ER model is a superset of all other data models  
B) The NIAM method is more comprehensive than the ER model  
C) Both models have their strengths and weaknesses, but the ER model is more widely used  
D) The ER model is only applicable to binary relationships, while NIAM can handle ternary relationships  
  
\*\*Answer:\*\* C) Both models have their strengths and weaknesses, but the ER model is more widely used  
  
\*\*LEVEL: Evaluate\*\*  
\*\*PAGE SOURCE: 110\*\*  
  
\*\*Question 5: Justify\*\*  
Justify why a high-level data model, such as the Entity-Relationship model, is essential in the database design process.  
  
A) A high-level data model provides too much detail for practical application  
B) The ER model is only applicable to small-scale databases  
C) A high-level data model helps to abstract away from implementation details and focus on conceptual relationships  
D) High-level data models are only useful for theoretical purposes  
  
\*\*Answer:\*\* C) A high-level data model helps to abstract away from implementation details and focus on conceptual relationships  
  
\*\*LEVEL: Create\*\*  
\*\*PAGE SOURCE: 110\*\*  
  
\*\*Question 6: Generate\*\*  
Design an entity-relationship diagram (ERD) for a movie database that includes directors, movies, and production companies. Use the ER model concepts learned so far to create the diagram.  
  
A) [Insert your answer here]  
  
\*\*Answer:\*\* (Not provided)

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

Response: Here are six multiple-choice questions based on the given context:  
  
\*\*Level 1 (Remember):\*\*  
What is the purpose of the EXISTS keyword in a query?  
  
A) To filter out duplicate tuples  
B) To retrieve at least one tuple that satisfies the condition  
C) To sort the results in descending order  
D) To select only unique values  
  
Answer: B) To retrieve at least one tuple that satisfies the condition  
  
\*\*Level 2 (Understand):\*\*  
What is the difference between EXISTS and NOT EXISTS?  
  
A) EXISTS returns TRUE if no tuples are found, while NOT EXISTS returns FALSE  
B) EXISTS returns TRUE if at least one tuple is found, while NOT EXISTS returns FALSE  
C) EXISTS returns FALSE if no tuples are found, while NOT EXISTS returns TRUE  
D) EXISTS returns TRUE for duplicate values, while NOT EXISTS returns FALSE  
  
Answer: B) EXISTS returns TRUE if at least one tuple is found, while NOT EXISTS returns FALSE  
  
\*\*Level 3 (Apply):\*\*  
How would you modify the query Q16B to use NOT EXISTS instead of EXISTS?  
  
A) Replace EXISTS with NOT EXISTS  
B) Add a NOT keyword before the EXISTS clause  
C) Change the WHERE clause to SELECT \* FROM DEPENDENT AS D WHERE E.Ssn != D.Essn AND ...  
D) Remove the correlated subquery and replace it with a JOIN  
  
Answer: A) Replace EXISTS with NOT EXISTS  
  
\*\*Level 4 (Analyze):\*\*  
Compare and contrast Query 16A and Query 16B. What is the main difference between these two queries?  
  
A) The join type used in the query  
B) The correlated subquery and its use of EXISTS or NOT EXISTS  
C) The selection criteria for the EMPLOYEE relation  
D) The sorting order of the results  
  
Answer: B) The correlated subquery and its use of EXISTS or NOT EXISTS  
  
\*\*Level 5 (Evaluate):\*\*  
Justify whether Query 16B is more efficient than Query 16A. Provide a reason to support your answer.  
  
A) Yes, because it uses EXISTS which returns TRUE if at least one tuple is found  
B) No, because it still uses a correlated subquery  
C) Maybe, depending on the size of the EMPLOYEE and DEPENDENT relations  
D) Unknown, as it depends on various factors such as database schema and query optimizer  
  
Answer: B) No, because it still uses a correlated subquery  
  
\*\*Level 6 (Create):\*\*  
Modify Query 16B to retrieve only the unique Fname and Lname combinations from the EMPLOYEE relation. How would you do this?  
  
A) Use the GROUP BY clause with Fname and Lname  
B) Add a DISTINCT keyword after SELECT E.Fname, E.Lname  
C) Change the WHERE clause to AND E.Fname = D.Dependent\_name AND COUNT(DISTINCT E.Ssn) > 1  
D) Replace EXISTS with NOT EXISTS and add a GROUP BY clause  
  
Answer: A) Use the GROUP BY clause with Fname and Lname

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

Response: Here are six multiple-choice questions based on the provided context:  
  
\*\*Question 1\*\*  
LEVEL: Remember  
PAGE SOURCE: 1074-1075  
  
Define Factoid Questions.  
  
A) Questions that require application of big data tools and technologies.  
B) Questions that pinpoints the right phrase in a document or database.  
C) Questions that require hybrid answering strategies.  
D) Questions that involve ontological inference and search algorithms.  
  
Answer: B) Questions that pinpoints the right phrase in a document or database.  
  
\*\*Question 2\*\*  
LEVEL: Understand  
PAGE SOURCE: 1075  
  
Explain how named entity extractors are used in question answering systems.  
  
A) Named entity extractors are used to match questions against desired answer types.  
B) Named entity extractors are used to generate candidate answers from retrieved passages.  
C) Named entity extractors are used to parse and classify large document collections.  
D) Named entity extractors are not used in question answering systems.  
  
Answer: B) Named entity extractors are used to generate candidate answers from retrieved passages.  
  
\*\*Question 3\*\*  
LEVEL: Apply  
PAGE SOURCE: 1074-1075  
  
Solve the problem: What is the main concept involved in question answering?  
  
A) Parsing; named entity recognition (NER); focus extraction.  
B) Answer type extraction; relation extraction; ontological inference.  
C) Search, indexing, and classification algorithms.  
D) Knowledge engineering from large unstructured corpora.  
  
Answer: A) Parsing; named entity recognition (NER); focus extraction.  
  
\*\*Question 4\*\*  
LEVEL: Analyze  
PAGE SOURCE: 1075  
  
Compare the types of questions in question answering systems. Which type is not mutually exclusive?  
  
A) Factoid Questions, Definition Questions, and Rhetorical Questions.  
B) Factoid Questions, Comparison Questions, and Recommendation Questions.  
C) Factoid Questions, Definition Questions, and Open Questions.  
D) All of the above are mutually exclusive.  
  
Answer: C) Factoid Questions, Definition Questions, and Open Questions.

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

Response: Here are six multiple-choice questions and answers based on the context about the EXCEPT command:  
  
\*\*LEVEL 1. Remember\*\*  
Question: What is the purpose of the EXCEPT command in SQL?  
A) To specify the type of action to be taken when certain events occur  
B) To select all projects controlled by a department  
C) To find the set difference between two subqueries  
D) To create a trigger in SQL  
Answer: C) To find the set difference between two subqueries  
  
\*\*LEVEL 2. Understand\*\*  
Question: What is the result of using the EXCEPT command on two subqueries?  
A) The intersection of the two sets  
B) The union of the two sets  
C) The set difference (MINUS) of the first subquery and the second subquery  
D) The Cartesian product of the two sets  
Answer: C) The set difference (MINUS) of the first subquery and the second subquery  
  
\*\*LEVEL 3. Apply\*\*  
Question: How can you use the EXCEPT command to solve a problem?  
A) By using it with the MINUS operator  
B) By combining it with the IN operator  
C) By applying it in a WHERE clause condition  
D) By using it with a SELECT statement  
Answer: A) By using it with the MINUS operator  
  
\*\*LEVEL 4. Analyze\*\*  
Question: How does the EXCEPT command differ from other set operations in SQL?  
A) It is used to find the intersection of two sets  
B) It is used to find the union of two sets  
C) It is used to find the set difference (MINUS) between two subqueries  
D) It is used to create a trigger in SQL  
Answer: C) It is used to find the set difference (MINUS) between two subqueries  
  
\*\*LEVEL 5. Evaluate\*\*  
Question: What are the limitations of using the EXCEPT command?  
A) It can only be used with correlated subqueries  
B) It can only be used with non-correlated subqueries  
C) It is not applicable to all types of queries  
D) It is always the most efficient way to solve a problem  
Answer: C) It is not applicable to all types of queries  
  
\*\*LEVEL 6. Create\*\*  
Question: How might you use the EXCEPT command in a real-world application?  
A) To find the set of employees who do not work on a specific project  
B) To create a trigger that updates a table when certain conditions are met  
C) To generate a report of all customers who have made a purchase  
D) To create a view that shows the total sales for each region  
Answer: A) To find the set of employees who do not work on a specific project

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

Response: Here are six multiple-choice questions and answers based on the context:  
  
\*\*Remember Level\*\*  
  
1. What does the EXISTS function in SQL return?  
A) The number of tuples in the nested query result  
B) A Boolean value TRUE if the nested query result contains at least one tuple, or FALSE if it contains no tuples  
C) The sum of the attributes in the nested query result  
D) The average of the attributes in the nested query result  
  
Answer: B) A Boolean value TRUE if the nested query result contains at least one tuple, or FALSE if it contains no tuples  
  
LEVEL: Remember  
PAGE SOURCE: 226  
  
\*\*Understand Level\*\*  
  
2. What is the purpose of the EXISTS function in SQL?  
A) To retrieve all tuples from a relation  
B) To check whether the result of a nested query is empty (contains no tuples) or not  
C) To sort tuples in a relation  
D) To group tuples in a relation  
  
Answer: B) To check whether the result of a nested query is empty (contains no tuples) or not  
  
LEVEL: Understand  
PAGE SOURCE: 226  
  
\*\*Apply Level\*\*  
  
3. How would you rewrite Query 16 using the EXISTS function?  
A) SELECT E.Fname, E.Lname FROM EMPLOYEE AS E WHERE NOT EXISTS (SELECT \* FROM DEPENDENT AS D WHERE E.Ssn = D.Essn AND E.Sex = D.Sex)  
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)  
C) SELECT E.Fname, E.Lname FROM EMPLOYEE AS E WHERE NOT EXISTS (SELECT \* FROM DEPENDENT AS D WHERE E.Ssn = D.Essn AND E.Sex = D.Sex)  
D) None of the above  
  
Answer: 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)  
  
LEVEL: Apply  
PAGE SOURCE: 226  
  
\*\*Analyze Level\*\*  
  
4. What is the difference between EXISTS and NOT EXISTS in SQL?  
A) EXISTS returns the number of tuples, while NOT EXISTS returns a Boolean value  
B) EXISTS returns a Boolean value TRUE if there are no tuples, while NOT EXISTS returns FALSE if there are at least one tuple  
C) EXISTS returns a Boolean value TRUE if there is at least one tuple, while NOT EXISTS returns FALSE if there are no tuples  
D) None of the above  
  
Answer: C) EXISTS returns a Boolean value TRUE if there is at least one tuple, while NOT EXISTS returns FALSE if there are no tuples  
  
LEVEL: Analyze  
PAGE SOURCE: 226-227  
  
\*\*Evaluate Level\*\*  
  
5. What is the purpose of Query 6 using the NOT EXISTS function?  
A) To retrieve all employees with dependents  
B) To retrieve all employees who have no dependents  
C) To sort employees by their last name  
D) To group employees by their department  
  
Answer: B) To retrieve all employees who have no dependents  
  
LEVEL: Evaluate  
PAGE SOURCE: 226-227  
  
\*\*Create Level\*\*  
  
6. How would you use the EXISTS function to generate a list of all employees with at least one dependent?  
A) SELECT E.Fname, E.Lname FROM EMPLOYEE AS E WHERE NOT EXISTS (SELECT \* FROM DEPENDENT AS D WHERE E.Ssn = D.Essn AND E.Sex = D.Sex)  
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)  
C) SELECT E.Fname, E.Lname FROM EMPLOYEE AS E JOIN DEPENDENT AS D ON E.Ssn = D.Essn  
D) None of the above  
  
Answer: 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)  
  
LEVEL: Create  
PAGE SOURCE: 226-227

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

Response: Here are six multiple-choice questions based on the given context, focusing on the Foreign Key concept:  
  
\*\*LEVEL 1: Remember\*\*  
\*\*PAGE SOURCE:\*\* 308  
  
Q: What is a primary key in a relation that is used as a foreign key attribute in another relation?  
A) A unique identifier for each tuple  
B) An identifier that can be null  
C) The same as the primary key of S and T  
D) Used to identify the relationship between two entities  
Answer: C) The same as the primary key of S and T  
  
\*\*LEVEL 2: Understand\*\*  
\*\*PAGE SOURCE:\*\* 308  
  
Q: Why do we use a foreign key in a relation S when mapping binary M:N relationships?  
A) To avoid NULL values in the foreign key attribute  
B) To create a new relation to represent the relationship  
C) To identify the participating entity types at the N-side of the relationship  
D) To establish a unique identifier for each tuple  
Answer: A) To avoid NULL values in the foreign key attribute  
  
\*\*LEVEL 3: Apply\*\*  
\*\*PAGE SOURCE:\*\* 308  
  
Q: What is done to the initial CREATE TABLE statement when dealing with foreign keys that refer to relations not yet created?  
A) The constraints are added later using the ALTER TABLE statement  
B) The constraints are left out of the initial statement and then added later  
C) The constraints are modified to avoid NULL values  
D) The constraints are deleted altogether  
Answer: B) The constraints are left out of the initial statement and then added later  
  
\*\*LEVEL 4: Analyze\*\*  
\*\*PAGE SOURCE:\*\* 308  
  
Q: Compare and contrast the foreign key approach and the relationship relation (cross-reference) option for mapping binary M:N relationships.  
A) The foreign key approach creates a new relation, while the relationship relation option does not  
B) Both approaches create a new relation to represent the relationship  
C) The foreign key approach is used when few tuples participate in the relationship, while the relationship relation option is used when many tuples participate  
D) The relationship relation option avoids NULL values in the foreign key attribute  
Answer: C) The foreign key approach is used when few tuples participate in the relationship, while the relationship relation option is used when many tuples participate  
  
\*\*LEVEL 5: Evaluate\*\*  
\*\*PAGE SOURCE:\*\* 308  
  
Q: Justify why we cannot represent an M:N relationship type by a single foreign key attribute in one of the participating relations.  
A) Because it would create excessive NULL values  
B) Because it would require multiple relations to represent the relationship  
C) Because it would not establish a unique identifier for each tuple  
D) Because it would be difficult to query and maintain  
Answer: A) Because it would create excessive NULL values  
  
\*\*LEVEL 6: Create\*\*  
\*\*PAGE SOURCE:\*\* None (new question)  
  
Q: Generate an example of how to apply the foreign key approach to map a binary M:N relationship type WORKS\_FOR, CONTROLS, and SUPERVISION from Figure 9.1.  
(Note: This is not based on a specific page source but rather a new question that requires creation)

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

Response: Here are six multiple-choice questions based on the context:  
  
\*\*Remember (Level 1, Page 518)\*\*  
Question: What is an FD X → Y inferred from or implied by a set of dependencies F specified on R?  
A) An FD that holds in every legal relation state r of R  
B) An FD that does not hold in every legal relation state r of R  
C) An FD that can be derived from and satisfy the dependencies in F  
D) An FD that cannot be inferred or implied by a set of dependencies F  
  
Answer: A) An FD that holds in every legal relation state r of R  
  
\*\*Understand (Level 2, Page 519)\*\*  
Question: What is the purpose of defining an inferred or implied functional dependency?  
A) To specify all possible functional dependencies for a given situation  
B) To infer new dependencies from a given set of dependencies  
C) To define a concept called closure formally that includes all possible dependencies  
D) To develop a unified framework that includes both FDs and MVDs  
  
Answer: B) To infer new dependencies from a given set of dependencies  
  
\*\*Apply (Level 3, Page 520)\*\*  
Question: What is the result of applying the inference rules for functional dependencies to a given set of dependencies F?  
A) A set of all possible functional dependencies that can be inferred from F  
B) A set of all functional dependencies that must be explicitly stated in addition to the given FDs  
C) A set of new dependencies that are not already present in F  
D) A set of dependencies that do not hold in every legal relation state r of R  
  
Answer: A) A set of all possible functional dependencies that can be inferred from F  
  
\*\*Analyze (Level 4, Page 521)\*\*  
Question: Compare and contrast the concepts of FDs and MVDs. How are they related?  
A) FDs are a special case of MVDs  
B) MVDs are a generalization of FDs  
C) Both FDs and MVDs are types of functional dependencies  
D) There is no relationship between FDs and MVDs  
  
Answer: B) MVDs are a generalization of FDs  
  
\*\*Evaluate (Level 5, Page 522)\*\*  
Question: Justify the importance of defining the concept of inferred or implied functional dependencies.  
A) It allows us to specify all possible functional dependencies for a given situation  
B) It enables us to infer new dependencies from a given set of dependencies  
C) It provides a unified framework that includes both FDs and MVDs  
D) It is not important and can be ignored  
  
Answer: B) It enables us to infer new dependencies from a given set of dependencies  
  
\*\*Create (Level 6, Page 523)\*\*  
Question: Generate a scenario where multiple functional dependencies are inferred or implied by a set of dependencies F specified on R.  
A) A department has one manager and each employee has a unique phone number  
B) A student is enrolled in only one course and each course has a unique ID  
C) A customer can have multiple orders and each order has a unique ID  
D) A product has multiple attributes and each attribute has a unique value  
  
Answer: A) A department has one manager and each employee has a unique phone number

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

Response: Here are six multiple-choice questions based on the context of the GRANT command:  
  
\*\*Question 1:\*\* (LEVEL: Remember)  
What is the purpose of the GRANT command in a database management system?  
  
A) To restrict privileges  
B) To grant privileges  
C) To revoke privileges  
D) To create a new account  
  
Answer: B) To grant privileges  
  
\*\*PAGE SOURCE:\*\* [Document(metadata={'producer': 'Acrobat Distiller 15.0 (Windows); modified using iText 2.1.7 by 1T3XT', 'creator': 'HELIOS pdfcat', 'creationdate': '2016-02-04T04:28:03+02:00', 'author': 'Ramez Elmasri, Shamkant B. Navathe', 'moddate': '2025-07-13T15:03:15+07:00', 'title': 'Fundamentals of Database Systems Seventh Edition', 'source': '/content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf', 'total\_pages': 1176, 'page': 1145, 'page\_label': '1146'}, page\_content='propagate these privileges to additional accounts.')  
  
\*\*Question 2:\*\* (LEVEL: Understand)  
What is the GRANT OPTION in a database management system?  
  
A) A way to restrict privileges  
B) A way to grant and propagate privileges  
C) A way to revoke privileges  
D) A way to create a new account  
  
Answer: B) A way to grant and propagate privileges  
  
\*\*PAGE SOURCE:\*\* [Document(metadata={'producer': 'Acrobat Distiller 15.0 (Windows); modified using iText 2.1.7 by 1T3XT', 'creator': 'HELIOS pdfcat', 'creationdate': '2016-02-04T04:28:03+02:00', 'author': 'Ramez Elmasri, Shamkant B. Navathe', 'moddate': '2025-07-13T15:03:15+07:00', 'title': 'Fundamentals of Database Systems Seventh Edition', 'source': '/content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf', 'total\_pages': 1176, 'page': 1145, 'page\_label': '1146'}, page\_content='propagate these privileges to additional accounts.')  
  
\*\*Question 3:\*\* (LEVEL: Apply)  
Suppose account A1 has the GRANT OPTION on a relation. What can A1 do with this option?  
  
A) Grant and revoke privileges  
B) Only grant privileges  
C) Only revoke privileges  
D) Create a new account  
  
Answer: B) Only grant privileges  
  
\*\*PAGE SOURCE:\*\* [Document(metadata={'producer': 'Acrobat Distiller 15.0 (Windows); modified using iText 2.1.7 by 1T3XT', 'creator': 'HELIOS pdfcat', 'creationdate': '2016-02-04T04:28:03+02:00', 'author': 'Ramez Elmasri, Shamkant B. Navathe', 'moddate': '2025-07-13T15:03:15+07:00', 'title': 'Fundamentals of Database Systems Seventh Edition', 'source': '/content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf', 'total\_pages': 1176, 'page': 1145, 'page\_label': '1146'}, page\_content='propagate these privileges to additional accounts.')  
  
\*\*Question 4:\*\* (LEVEL: Analyze)  
What is the difference between horizontal and vertical propagation limits in a database management system?  
  
A) Horizontal propagation allows for more flexible granting of privileges  
B) Vertical propagation allows for more flexible granting of privileges  
C) Horizontal propagation limits the sequence of GRANT OPTIONS, while vertical propagation does not  
D) Vertical propagation limits the sequence of GRANT OPTIONS, while horizontal propagation does not  
  
Answer: D) Vertical propagation limits the sequence of GRANT OPTIONS, while horizontal propagation does not  
  
\*\*PAGE SOURCE:\*\* [Document(metadata={'producer': 'Acrobat Distiller 15.0 (Windows); modified using iText 2.1.7 by 1T3XT', 'creator': 'HELIOS pdfcat', 'creationdate': '2016-02-04T04:28:03+02:00', 'author': 'Ramez Elmasri, Shamkant B. Navathe', 'moddate': '2025-07-13T15:03:15+07:00', 'title': 'Fundamentals of Database Systems Seventh Edition', 'source': '/content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf', 'total\_pages': 1176, 'page': 1076, 'page\_label': '1077'}, page\_content='We briefly illustrate horizontal and vertical propagation limits—which are not available currently in SQL or other relational systems—with an example.')  
  
\*\*Question 5:\*\* (LEVEL: Evaluate)  
What is the advantage of using the GRANT OPTION in a database management system?  
  
A) It allows for more restrictive granting of privileges  
B) It allows for more flexible granting of privileges  
C) It only applies to account owners  
D) It does not apply to any accounts  
  
Answer: B) It allows for more flexible granting of privileges  
  
\*\*PAGE SOURCE:\*\* [Document(metadata={'producer': 'Acrobat Distiller 15.0 (Windows); modified using iText 2.1.7 by 1T3XT', 'creator': 'HELIOS pdfcat', 'creationdate': '2016-02-04T04:28:03+02:00', 'author': 'Ramez Elmasri, Shamkant B. Navathe', 'moddate': '2025-07-13T15:03:15+07:00', 'title': 'Fundamentals of Database Systems Seventh Edition', 'source': '/content/drive/MyDrive/Colab Notebooks/Llama3/RDB.pdf', 'total\_pages': 1176, 'page': 1145, 'page\_label': '1146'}, page\_content='propagate these privileges to additional accounts.')  
  
\*\*Question 6:\*\* (LEVEL: Create)  
Develop a scenario where an account A1 grants the SELECT privilege on a relation to account A2 with the GRANT OPTION.  
  
A) A1 grants the SELECT privilege on the relation to A2, but A2 cannot grant it to others  
B) A1 grants the SELECT privilege on the relation to A2 with the GRANT OPTION, allowing A2 to grant it to others  
C) A1 grants the SELECT privilege on the relation to A2, and A2 can only use it for personal purposes  
D) A1 grants the SELECT privilege on the relation to A2, but A2 cannot revoke it  
  
Answer: B) A1 grants the SELECT privilege on the relation to A2 with the GRANT OPTION, allowing A2 to grant it to others

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

Response: Here are six multiple-choice questions based on the context about the GROUP BY command:  
  
\*\*LEVEL 3 - Understand\*\*  
\*\*PAGE SOURCE: 428-429\*\*  
  
1. Question: What is the purpose of the GROUP BY clause in a query?  
A) To filter out duplicate rows  
B) To group rows based on one or more columns  
C) To sort the result set  
D) To retrieve specific columns  
  
Answer: B) To group rows based on one or more columns  
  
\*\*LEVEL 2 - Remember\*\*  
\*\*PAGE SOURCE: 428-429\*\*  
  
2. Question: What is an example of a query that uses the GROUP BY clause?  
A) Q16 retrieves the number of majors in each department.  
B) Q5 selects all employees who have two or more dependents.  
C) SELECT \* FROM EMPLOYEE;  
D) SELECT COUNT(\*) FROM DEPENDENT;  
  
Answer: A) Q16 retrieves the number of majors in each department.  
  
\*\*LEVEL 4 - Analyze\*\*  
\*\*PAGE SOURCE: 428-429\*\*  
  
3. Question: How does the GROUP BY clause work with aggregate functions?  
A) It ignores the aggregate function and returns a list of all values  
B) It applies the aggregate function to each group separately  
C) It applies the aggregate function to the entire result set  
D) It is not compatible with aggregate functions  
  
Answer: B) It applies the aggregate function to each group separately  
  
\*\*LEVEL 5 - Evaluate\*\*  
\*\*PAGE SOURCE: 231-232\*\*  
  
4. Question: What is a common use case for using the GROUP BY clause?  
A) To retrieve specific columns from a table  
B) To filter out duplicate rows from a result set  
C) To group rows based on one or more columns and apply aggregate functions  
D) To sort the result set in descending order  
  
Answer: C) To group rows based on one or more columns and apply aggregate functions  
  
\*\*LEVEL 1 - Remember\*\*  
\*\*PAGE SOURCE: 428-429\*\*  
  
5. Question: What is an example of a query that uses the GROUP BY clause with an aggregate function?  
A) SELECT Lname, Fname FROM EMPLOYEE WHERE (SELECT COUNT(\*) FROM DEPENDENT WHERE Ssn = Essn) > 2;  
B) SELECT \* FROM EMPLOYEE;  
C) SELECT COUNT(\*) FROM DEPENDENT;  
D) SELECT AVG(Salary) FROM EMPLOYEE;  
  
Answer: A) SELECT Lname, Fname FROM EMPLOYEE WHERE (SELECT COUNT(\*) FROM DEPENDENT WHERE Ssn = Essn) > 2;  
  
\*\*LEVEL 6 - Create\*\*  
\*\*PAGE SOURCE: 428-429\*\*  
  
6. Question: How would you modify the GROUP BY clause to group rows based on multiple columns?  
A) Use the OR operator between column names  
B) Use the AND operator between column names  
C) Use parentheses around the column names  
D) Use a comma-separated list of column names  
  
Answer: C) Use parentheses around the column names

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

Response: Here are six multiple-choice questions based on the context:  
  
\*\*LEVEL 3\*\*  
\*\*PAGE SOURCE\*\*: 231-232  
  
Q1: What is the purpose of the HAVING clause in SQL?  
A) To specify the columns to be retrieved  
B) To filter groups created by the GROUP BY clause  
C) To create a new table with aggregated data  
D) To modify the schema of a database  
  
Answer: B) To filter groups created by the GROUP BY clause  
  
\*\*LEVEL 4\*\*  
\*\*PAGE SOURCE\*\*: 231-232  
  
Q2: What is an example of using the HAVING clause?  
A) SELECT \* FROM EMPLOYEE WHERE Fname = 'John'  
B) SELECT Lname, Fname FROM EMPLOYEE GROUP BY Ssn HAVING COUNT(\*) > 1  
C) CREATE TABLE DEPARTMENT (Dept\_name VARCHAR(20))  
D) UPDATE EMPLOYEE SET Fname = 'Jane' WHERE Lname = 'Smith'  
  
Answer: B) SELECT Lname, Fname FROM EMPLOYEE GROUP BY Ssn HAVING COUNT(\*) > 1  
  
\*\*LEVEL 5\*\*  
\*\*PAGE SOURCE\*\*: 231-232  
  
Q3: Which aggregate function can be used with the HAVING clause?  
A) AVG  
B) SUM  
C) COUNT  
D) ALL  
  
Answer: C) COUNT  
  
\*\*LEVEL 6\*\*  
\*\*PAGE SOURCE\*\*: 231-232  
  
Q4: What is the purpose of combining GROUP BY and HAVING clauses in SQL?  
A) To retrieve specific rows from a table  
B) To filter groups created by the GROUP BY clause  
C) To create a new table with aggregated data  
D) To modify the schema of a database  
  
Answer: B) To filter groups created by the GROUP BY clause  
  
\*\*LEVEL 2\*\*  
\*\*PAGE SOURCE\*\*: 231-232  
  
Q5: What is the result of using the HAVING clause in SQL?  
A) A new table with aggregated data  
B) A filtered group from a GROUP BY operation  
C) A modified schema for a database  
D) An error message indicating invalid syntax  
  
Answer: B) A filtered group from a GROUP BY operation  
  
\*\*LEVEL 1\*\*  
\*\*PAGE SOURCE\*\*: 231-232  
  
Q6: What is the keyword used to specify filtering groups in SQL?  
A) FROM  
B) WHERE  
C) HAVING  
D) GROUP  
  
Answer: C) HAVING

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

Response: Here are six multiple-choice questions based on the implied concept:  
  
\*\*Question 1: Remember\*\*  
LEVEL: 1  
PAGE SOURCE: 1076-1077  
  
What is one way to generate candidate answers?  
  
A) Using a database query  
B) Named entity extraction and matching against desired answer types  
C) Applying machine learning algorithms  
D) Conducting a statistical analysis  
  
Answer: B) Named entity extraction and matching against desired answer types  
  
\*\*Question 2: Understand\*\*  
LEVEL: 2  
PAGE SOURCE: 1074-1075  
  
What is the purpose of binding statement parameters in a PreparedStatement query?  
  
A) To optimize query execution time  
B) To ensure data security  
C) To set parameter values at runtime  
D) To reduce query complexity  
  
Answer: C) To set parameter values at runtime  
  
\*\*Question 3: Apply\*\*  
LEVEL: 3  
PAGE SOURCE: 1076-1077  
  
Suppose you have a question, "What is the capital of France?" and you retrieve passages containing potential answers. How can you generate candidate answers?  
  
A) Using regular expression templates to match against lexical chunks  
B) Applying machine learning algorithms to classify passage contents  
C) Extracting named entities from retrieved passages  
D) Conducting a statistical analysis on passage contents  
  
Answer: A) Using regular expression templates to match against lexical chunks  
  
\*\*Question 4: Analyze\*\*  
LEVEL: 4  
PAGE SOURCE: 1076-1077  
  
How do surface pattern matching and structural matching algorithms differ in candidate answer generation?  
  
A) Surface pattern matching is used for offline search, while structural matching is used online  
B) Surface pattern matching extracts answers from lexical chunks, while structural matching aligns questions with passages  
C) Structural matching extracts answers from passage contents, while surface pattern matching applies machine learning algorithms  
D) Surface pattern matching uses regular expressions to match against passage contents, while structural matching parses questions and passages  
  
Answer: B) Surface pattern matching extracts answers from lexical chunks, while structural matching aligns questions with passages  
  
\*\*Question 5: Evaluate\*\*  
LEVEL: 5  
PAGE SOURCE: 1076-1077  
  
What are the advantages of using candidate answer generation techniques?  
  
A) They improve query execution time  
B) They enhance data security  
C) They provide more accurate answers by matching against desired answer types  
D) They reduce query complexity  
  
Answer: C) They provide more accurate answers by matching against desired answer types  
  
\*\*Question 6: Create\*\*  
LEVEL: 6  
PAGE SOURCE: none  
  
Design a hybrid approach to candidate answer generation that combines surface pattern matching and structural matching algorithms. How would you integrate these techniques to improve answer accuracy?  
  
(Note: This question is open-ended, and the answer will depend on the creativity of the respondent.)

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

Response: Here are six multiple-choice questions based on the Inner Join concept:  
  
\*\*LEVEL 1. Remember\*\*  
Question: What is another name for an inner join?  
A) Outer Join  
B) Natural Join  
C) Inner Join  
D) Cartesian Product  
Answer: C) Inner Join  
  
Page Source: Level 1, Page 267  
  
\*\*LEVEL 2. Understand\*\*  
Question: Describe the main function of an inner join operation.  
A) To combine two tables based on a common attribute and retrieve all matching tuples.  
B) To combine two tables based on a common attribute and retrieve only unmatched tuples.  
C) To combine two tables without considering any common attributes.  
D) To separate two tables into distinct results.  
  
Answer: A) To combine two tables based on a common attribute and retrieve all matching tuples.  
  
Page Source: Level 2, Page 267  
  
\*\*LEVEL 3. Apply\*\*  
Question: Suppose you want to join the EMPLOYEE table with the DEPARTMENT table based on the Dnum attribute. What type of join operation would you use?  
A) Inner Join  
B) Outer Join  
C) Natural Join  
D) Cartesian Product  
  
Answer: A) Inner Join  
  
Page Source: Level 3, Page 229  
  
\*\*LEVEL 4. Analyze\*\*  
Question: Compare and contrast an inner join with a natural join.  
A) An inner join retrieves all matching tuples while a natural join only retrieves unmatched tuples.  
B) An inner join combines two tables based on a common attribute while a natural join combines two tables without considering any common attributes.  
C) An inner join is used for multiway joins, while a natural join is used for single-way joins.  
D) An inner join uses a specified condition to match tuples, while a natural join matches tuples based on all common attributes.  
  
Answer: D) An inner join uses a specified condition to match tuples, while a natural join matches tuples based on all common attributes.  
  
Page Source: Level 4, Page 267  
  
\*\*LEVEL 5. Evaluate\*\*  
Question: Justify the use of an inner join in retrieving data from two tables.  
A) An inner join is used when you want to retrieve only unmatched tuples between two tables.  
B) An inner join is used when you want to retrieve all matching tuples between two tables based on a common attribute.  
C) An inner join is used when one table has more rows than the other table.  
D) An inner join is used when the join condition is not specified.  
  
Answer: B) An inner join is used when you want to retrieve all matching tuples between two tables based on a common attribute.  
  
Page Source: Level 5, Page 229  
  
\*\*LEVEL 6. Create\*\*  
Question: Generate an example of a multiway join using three tables.  
A) EMPLOYEE-DEPARTMENT-PROJECT  
B) CUSTOMER-ORDER-ITEM  
C) STUDENT-COURSE-INSTRUCTOR  
D) EMPLOYEE-PROJECT-FUNDING  
  
Answer: A) EMPLOYEE-DEPARTMENT-PROJECT  
  
Page Source: Level 6, Page 681

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

Response: Here are six multiple-choice questions based on the context:  
  
\*\*Remember Level\*\*  
\*\*Page Source: 212\*\*  
  
Q1: What is the simplest form of the INSERT command in SQL?  
A) INSERT INTO EMPLOYEE (Fname, Lname, Dno, Ssn)  
B) INSERT INTO EMPLOYEE VALUES ('Richard', 'Marini', 4, '653298653')  
C) INSERT INTO EMPLOYEE (relation name, list of values)  
D) INSERT INTO EMPLOYEE (attribute names, values)  
  
Answer: C) INSERT INTO EMPLOYEE (relation name, list of values)  
  
\*\*Level: Remember\*\*  
\*\*Page Source: 212\*\*  
  
Q2: What must be specified in the simplest form of the INSERT command?  
A) Relation name and a list of attribute names  
B) Relation name and a list of values  
C) Attribute names only  
D) Values only  
  
Answer: B) Relation name and a list of values  
  
\*\*Understand Level\*\*  
\*\*Page Source: 212\*\*  
  
Q3: What is the second form of the INSERT statement used for?  
A) To add multiple tuples at once  
B) To specify explicit attribute names that correspond to the values provided  
C) To update existing tuples in a relation  
D) To delete tuples from a relation  
  
Answer: B) To specify explicit attribute names that correspond to the values provided  
  
\*\*Apply Level\*\*  
\*\*Page Source: 212\*\*  
  
Q4: How can you insert multiple tuples into a relation using a single INSERT command?  
A) By separating each tuple with commas and enclosing each tuple in parentheses  
B) By listing all the attributes and then listing the values for each tuple  
C) By specifying the relation name followed by the list of attribute names and values  
D) By using a separate UPDATE statement for each tuple  
  
Answer: A) By separating each tuple with commas and enclosing each tuple in parentheses  
  
\*\*Analyze Level\*\*  
\*\*Page Source: 212\*\*  
  
Q5: What happens to attributes not specified in the INSERT INTO EMPLOYEE (Fname, Lname, Dno, Ssn) command?  
A) They are set to NULL  
B) They are set to their DEFAULT values  
C) They are left unchanged  
D) They are assigned random values  
  
Answer: B) They are set to their DEFAULT values  
  
\*\*Evaluate Level\*\*  
\*\*Page Source: 212\*\*  
  
Q6: Why is it useful to specify explicit attribute names in the INSERT statement?  
A) To avoid specifying all attributes in the relation  
B) To ensure that only specified attributes are updated  
C) To provide a more concise way of inserting data  
D) To prevent errors when inserting multiple tuples  
  
Answer: B) To ensure that only specified attributes are updated

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

Response: Here are six multiple-choice questions based on the Intersection concept:  
  
\*\*Level 1. Remember\*\*  
Question: What is an intersection in database systems?  
A) A set operation that combines tuples from two relations  
B) A type of spatial data feature  
C) A method for selecting objects based on their spatial relationships  
D) A way to combine Boolean predicates  
  
Answer: A) A set operation that combines tuples from two relations  
  
\*\*Level 2. Understand\*\*  
Question: What happens when a new tuple is inserted into the view V=R∩S?  
A) It is removed from the relation R if it exists in S  
B) It is compared against the relation R to see if it is present there  
C) It is inserted into the relation R if it does not exist in S  
D) It is matched against the relation S to determine its presence  
  
Answer: B) It is compared against the relation R to see if it is present there  
  
\*\*Level 3. Apply\*\*  
Question: Suppose we have two relations, R and S, and their intersection V=R∩S. How do we update the view when a tuple rd is deleted?  
A) We insert rd into the view V  
B) We remove rd from the view V if it exists in the relation R  
C) We compare rd against the view V to determine its presence  
D) We match rd against the relation S to see if it exists there  
  
Answer: B) We remove rd from the view V if it exists in the relation R  
  
\*\*Level 4. Analyze\*\*  
Question: Compare and contrast the intersection operation with other set operations (union, difference).  
A) Intersection is similar to union because they both combine tuples  
B) Intersection is similar to difference because they both involve removing tuples  
C) Intersection is unique because it combines tuples from two relations based on their common presence in both  
D) Intersection is equivalent to the Cartesian product operation  
  
Answer: C) Intersection is unique because it combines tuples from two relations based on their common presence in both  
  
\*\*Level 5. Evaluate\*\*  
Question: Justify why the intersection operation is useful in database systems.  
A) It allows for efficient data retrieval and manipulation  
B) It enables complex spatial queries to be answered accurately  
C) It simplifies the process of updating views based on changes to underlying relations  
D) It provides a way to combine multiple conditions in a single query  
  
Answer: A) It allows for efficient data retrieval and manipulation  
  
\*\*Level 6. Create\*\*  
Question: Generate an example scenario where the intersection operation would be useful.  
A) A database of book titles, authors, and genres; users want to find books that are both fiction and have a genre of science fiction  
B) A spatial database of roads and cities; users want to find roads that intersect with city boundaries  
C) A database of customer purchases; users want to find customers who have purchased both product X and Y  
D) A database of weather data; users want to find days when the temperature was both above 80°F and below 100°F  
  
Answer: B) A spatial database of roads and cities; users want to find roads that intersect with city boundaries

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

Response: Here are six multiple-choice questions and answers based on the context of isolation levels:  
  
\*\*Level 1: Remember\*\*  
Q: Define Level 0 (zero) isolation in a transaction.  
A) The transaction does not over-write the dirty reads of higher-level transactions.  
B) The transaction always commits to the database snapshot when it starts.  
C) The transaction sees the committed values of data items in the database.  
D) The transaction has no lost updates or dirty reads.  
  
Answer: A) The transaction does not over-write the dirty reads of higher-level transactions.  
  
LEVEL: Remember  
PAGE SOURCE: 771  
  
\*\*Level 2: Understand\*\*  
Q: Describe Level 1 isolation in a transaction.  
A) It has no lost updates and no dirty reads.  
B) It always commits to the database snapshot when it starts.  
C) It sees the committed values of data items in the database.  
D) It is based on the concept of snapshot isolation.  
  
Answer: A) It has no lost updates and no dirty reads.  
  
LEVEL: Understand  
PAGE SOURCE: 771  
  
\*\*Level 3: Apply\*\*  
Q: Apply Level 2 isolation to a transaction that does not over-write the dirty reads of higher-level transactions.  
A) The transaction always commits to the database snapshot when it starts.  
B) The transaction has repeatable reads and no lost updates or dirty reads.  
C) The transaction sees the committed values of data items in the database.  
D) The transaction is based on the concept of snapshot isolation.  
  
Answer: B) The transaction has repeatable reads and no lost updates or dirty reads.  
  
LEVEL: Apply  
PAGE SOURCE: 772  
  
\*\*Level 4: Analyze\*\*  
Q: Compare Level READ COMMITTED with Level REPEATABLE READ in terms of isolation.  
A) Level READ COMMITTED has higher isolation than Level REPEATABLE READ.  
B) Level REPEATABLE READ has higher isolation than Level READ COMMITTED.  
C) Both levels have the same level of isolation.  
D) There is no comparison between the two levels.  
  
Answer: B) Level REPEATABLE READ has higher isolation than Level READ COMMITTED.  
  
LEVEL: Analyze  
PAGE SOURCE: 794  
  
\*\*Level 5: Evaluate\*\*  
Q: Justify whether snapshot isolation can ensure that the phantom record problem does not occur.  
A) Yes, it ensures that the phantom record problem does not occur.  
B) No, it cannot ensure that the phantom record problem does not occur.  
C) It depends on the specific database system being used.  
D) There is no justification needed.  
  
Answer: A) Yes, it ensures that the phantom record problem does not occur.  
  
LEVEL: Evaluate  
PAGE SOURCE: 794  
  
\*\*Level 6: Create\*\*  
Q: Develop a protocol based on snapshot isolation to control concurrency in a database system.  
A) Use a locking-based protocol and assume that only one version of a data item exists.  
B) Use an optimistic protocol and assume that multiple versions of a data item can exist.  
C) Use a pessimistic protocol and assume that the transaction always commits to the database snapshot when it starts.  
D) There is no protocol based on snapshot isolation.  
  
Answer: B) Use an optimistic protocol and assume that multiple versions of a data item can exist.  
  
LEVEL: Create  
PAGE SOURCE: 795

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

Response: Here are six multiple-choice questions based on the context:  
  
\*\*Level 1: Remember\*\*  
Question: Define EQUIJOIN.  
A) A join operation that combines two tables  
B) A type of inner join  
C) A way to implement a two-way join  
D) A method for performing multiway joins  
Answer: C) A way to implement a two-way join  
LEVEL: 1, PAGE SOURCE: [EQUIJOIN (or NATURAL JOIN)]  
  
  
\*\*Level 2: Understand\*\*  
Question: Explain the purpose of using the CARTESIAN PRODUCT operation.  
A) To generate all possible tuple combinations  
B) To perform a join operation on two tables  
C) To specify a multiway join  
D) To optimize query execution plans  
Answer: A) To generate all possible tuple combinations  
LEVEL: 2, PAGE SOURCE: [the CARTESIAN PRODUCT operation (see Section 8.2.2)]  
  
  
\*\*Level 3: Apply\*\*  
Question: How can you use dynamic programming to optimize query execution plans?  
A) By considering the "optimal" plan for evaluating temp1 and not revisiting that plan  
B) By using a nonheuristic exhaustive approach  
C) By sorting the result of the join based on the join attributes  
D) By grouping the results of the query by the join attributes  
Answer: A) By considering the "optimal" plan for evaluating temp1 and not revisiting that plan  
LEVEL: 3, PAGE SOURCE: [The order in which the result of the join is generated is also important...]  
  
  
\*\*Level 4: Analyze\*\*  
Question: Compare the benefits of using a heuristic approach to query optimization with a nonheuristic exhaustive approach.  
A) The heuristic approach is more efficient and produces better results  
B) The nonheuristic approach is faster and requires less computational resources  
C) Both approaches have their own strengths and weaknesses, depending on the specific query and database schema  
D) The heuristic approach is only suitable for simple queries, while the nonheuristic approach is required for complex queries  
Answer: C) Both approaches have their own strengths and weaknesses, depending on the specific query and database schema  
LEVEL: 4, PAGE SOURCE: [The order in which the result of the join is generated is also important...]  
  
  
\*\*Level 5: Evaluate\*\*  
Question: Justify the importance of considering the ordering beneficial for the next join.  
A) It allows for more efficient query execution plans  
B) It enables the optimization of multiway joins  
C) It improves the accuracy of the results returned by a query  
D) It is not important for query optimization  
Answer: A) It allows for more efficient query execution plans  
LEVEL: 5, PAGE SOURCE: [The order in which the result of the join is generated is also important...]  
  
  
\*\*Level 6: Create\*\*  
Question: Generate an example of how to specify a multiway join using SQL.  
A) SELECT \* FROM EMPLOYEE JOIN DEPARTMENT ON Dnum = Dnumber  
B) SELECT \* FROM PROJECT JOIN DEPARTMENT ON Plocation = 'Stafford'  
C) SELECT \* FROM (PROJECT JOIN DEPARTMENT ON Dnum = Dnumber) JOIN EMPLOYEE ON Mgr\_ssn = Ssn  
D) SELECT \* FROM (EMPLOYEE JOIN DEPARTMENT ON Dnum = Dnumber) JOIN PROJECT ON Pnumber = Enumber  
Answer: C) SELECT \* FROM (PROJECT JOIN DEPARTMENT ON Dnum = Dnumber) JOIN EMPLOYEE ON Mgr\_ssn = Ssn  
LEVEL: 6, PAGE SOURCE: [Q2A is a differ-\nent way of specifying query Q2 from Section 6.3.1 using the concept of a joined table:]

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

Response: Here are six multiple-choice questions based on the text:  
  
\*\*Question 1: Remember\*\*  
LEVEL: Remember  
PAGE SOURCE: Page 645  
What is a composite key in a database system?A) A single attribute that uniquely identifies a recordB) A combination of two or more attributes that uniquely identifies a recordC) An index created on multiple attributesD) A type of foreign key Answer: B) A combination of two or more attributes that uniquely identifies a record

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

Response: Here are six multiple-choice questions and answers based on the context about LEFT OUTER JOIN:  
  
\*\*LEVEL 1. Remember\*\*  
  
Q: What is a LEFT OUTER JOIN in database systems?A) A type of inner join that combines rows from two tablesB) A query operation that returns all records when there is no matchC) A type of join that only includes matching recordsD) A combination of an inner and anti-join  
  
Answer: B) A query operation that returns all records when there is no match

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

Response: Here are six multiple-choice questions based on the provided context:  
  
\*\*LEVEL 1: Remember\*\*  
Question: What is a type of lock used in shared/exclusive locking scheme?  
A) Binary Lock  
B) Read-Write Lock  
C) Exclusive Lock  
D) Shared Lock  
Answer: A) Binary Lock  
PAGE SOURCE: 798  
  
\*\*LEVEL 2: Understand\*\*  
Question: Why do read operations on the same item by different transactions not conflict with each other in shared/exclusive locking scheme?  
A) Because only one transaction can access the item at a time.  
B) Because multiple transactions can access the item for reading purposes without conflicting.  
C) Because write operations are always exclusive.  
D) Because locks are not used in this scheme.  
Answer: B) Because multiple transactions can access the item for reading purposes without conflicting.  
PAGE SOURCE: 798  
  
\*\*LEVEL 3: Apply\*\*  
Question: What operation must a transaction issue before performing any read\_item(X) operation?  
A) write\_lock(X)  
B) read\_lock(X)  
C) unlock(X)  
D) lock\_item(X)  
Answer: B) read\_lock(X)  
PAGE SOURCE: 785  
  
\*\*LEVEL 4: Analyze\*\*  
Question: Compare the binary locking scheme with shared/exclusive locking scheme. How do they differ in their locking operations?  
A) Binary locking allows multiple transactions to access an item, while shared/exclusive locking only allows one transaction.  
B) Shared/exclusive locking is more restrictive than binary locking because it allows only one transaction to access an item.  
C) Both schemes allow multiple transactions to access an item, but binary locking does not use locks.  
D) Binary locking uses a different type of lock than shared/exclusive locking.  
Answer: B) Shared/exclusive locking is more restrictive than binary locking because it allows only one transaction to access an item.  
PAGE SOURCE: 798  
  
\*\*LEVEL 5: Evaluate\*\*  
Question: Justify why the system must enforce the rules for shared/exclusive locking scheme. Provide an example of a situation where these rules are necessary.  
A) To prevent conflicts between transactions that read and write the same item.  
B) To ensure that only one transaction can access an item at a time.  
C) To allow multiple transactions to access an item for reading purposes without conflicting.  
D) To enforce the two-phase locking protocol.  
Answer: A) To prevent conflicts between transactions that read and write the same item.  
PAGE SOURCE: 785  
  
\*\*LEVEL 6: Create\*\*  
Question: Modify the binary locking scheme to create a new locking mechanism that allows multiple transactions to access an item for reading purposes only. What type of lock would you use in this modified scheme?  
A) Exclusive Lock  
B) Shared Lock  
C) Read-Write Lock  
D) Multi-Mode Lock  
Answer: B) Shared Lock  
PAGE SOURCE: 798

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

Response: Here are six multiple-choice questions and answers based on the logging concept:  
  
\*\*LEVEL 3, PAGE SOURCE: Fundamentals of Database Systems Seventh Edition, Page 769\*\*  
  
1. Question: What is the purpose of a log file in a database system?  
A) To store transaction data for future reference  
B) To provide backup storage for catastrophic failures  
C) To append new transaction information to disk storage  
D) To enable concurrent transactions with shared locks  
  
Answer: A) To store transaction data for future reference  
  
\*\*LEVEL 2, PAGE SOURCE: Fundamentals of Database Systems Seventh Edition, Page 769\*\*  
  
2. Question: What type of failure can affect a log file?  
A) Disk failure only  
B) Main memory buffer failure  
C) Catastrophic failure only  
D) All types of failures except for disk or catastrophic  
  
Answer: D) All types of failures except for disk or catastrophic  
  
\*\*LEVEL 4, PAGE SOURCE: Fundamentals of Database Systems Seventh Edition, Page 769\*\*  
  
3. Question: How are log buffers typically implemented?  
A) As main memory buffers that hold the last part of the log file  
B) As a separate file on disk storage  
C) As a temporary buffer for each transaction  
D) As a cache for frequently accessed data  
  
Answer: A) As main memory buffers that hold the last part of the log file  
  
\*\*LEVEL 5, PAGE SOURCE: Fundamentals of Database Systems Seventh Edition, Page 769\*\*  
  
4. Question: What is the purpose of backing up a log file to archival storage?  
A) To provide a redundant copy for failover purposes  
B) To enable recovery from catastrophic failures  
C) To reduce disk space requirements  
D) To improve query performance  
  
Answer: B) To enable recovery from catastrophic failures  
  
\*\*LEVEL 1, PAGE SOURCE: Fundamentals of Database Systems Seventh Edition, Page 769\*\*  
  
5. Question: What are the types of entries in a log file?  
A) Transaction data and user information  
B) System logs and error messages  
C) Log buffers and archival storage  
D) Types of log entries (transaction operations, etc.)  
  
Answer: D) Types of log entries (transaction operations, etc.)  
  
\*\*LEVEL 6, PAGE SOURCE: Fundamentals of Database Systems Seventh Edition, Page 769\*\*  
  
6. Question: How are log entries typically added to a log file?  
A) By appending new transaction information to disk storage  
B) By overwriting existing log entries with new ones  
C) By periodically backing up the log file to archival storage  
D) By using a combination of main memory buffers and disk storage  
  
Answer: A) By appending new transaction information to disk storage

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

Response: Here are six multiple-choice questions and answers based on the context about Lossless Join:  
  
\*\*Question 1: Remember - Level\*\*  
What is a Lossless Join?  
  
A) A type of join that produces all possible tuple combinations.  
B) A technique to implement two-way joins.  
C) A method to optimize query execution plans.  
D) A process to combine multiple relational tables.  
  
Answer: B) A technique to implement two-way joins. - Level 1, Page Source: None  
  
\*\*Question 2: Understand - Level\*\*  
What is the main goal of a Lossless Join?  
  
A) To eliminate duplicate tuples in the result set.  
B) To produce all possible tuple combinations from multiple tables.  
C) To combine data from multiple relational tables without losing any information.  
D) To optimize query execution plans by reducing the number of joins.  
  
Answer: C) To combine data from multiple relational tables without losing any information. - Level 2, Page Source: None  
  
\*\*Question 3: Apply - Level\*\*  
Suppose you have two relational tables, EMPLOYEE and DEPARTMENT, and you want to perform a Lossless Join on the Dno attribute. What would be the join operation?  
  
A) R A=B S  
B) R B=A S  
C) R Dno=Dnumber DEPARTMENT  
D) R Eno=Eid EMPLOYEE  
  
Answer: C) R Dno=Dnumber DEPARTMENT - Level 3, Page Source: None  
  
\*\*Question 4: Analyze - Level\*\*  
How many possible ways can a Lossless Join be implemented?  
  
A) 6  
B) 36  
C) The number of possible join orders grows rapidly because of the combinatorial explosion.  
D) There is no fixed number of implementations, it depends on the specific join attributes.  
  
Answer: C) The number of possible join orders grows rapidly because of the combinatorial explosion. - Level 4, Page Source: None  
  
\*\*Question 5: Evaluate - Level\*\*  
What are some physical level heuristics used by an optimizer to optimize query execution plans?  
  
A) Only cost-based optimization approaches.  
B) Heuristics that consider only Cartesian products and joins before them.  
C) Some of the types of physical level heuristics include index-based nested-loop join, trying to use indexes, and applying a cost-based optimization approach directly.  
D) None of the above.  
  
Answer: C) Some of the types of physical level heuristics include index-based nested-loop join, trying to use indexes, and applying a cost-based optimization approach directly. - Level 5, Page Source: None  
  
\*\*Question 6: Create - Level\*\*  
Suppose you have three relational tables, EMPLOYEE, DEPARTMENT, and PROJECT, and you want to perform a Lossless Join on the Dno attribute. What would be the join operation?  
  
A) R A=B S  
B) R B=A T  
C) R Dno=Dnumber DEPARTMENT JOIN PROJECT  
D) R Eno=Eid EMPLOYEE JOIN DEPARTMENT  
  
Answer: C) R Dno=Dnumber DEPARTMENT JOIN PROJECT - Level 6, Page Source: None

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

Response: Here are six multiple-choice questions and answers based on the context:  
  
\*\*LEVEL 1: Remember\*\*  
\*\*Page Source:\*\* Fundamentals of Database Systems Seventh Edition, Page 1150-1151  
Question: What is a characteristic of Mandatory Access Control (MAC)?  
A) Flexibility  
B) Vulnerability to malicious attacks  
C) High degree of protection  
D) Strict classification of subjects and objects into security levels  
  
Answer: D) Strict classification of subjects and objects into security levels  
  
\*\*LEVEL 2: Understand\*\*  
\*\*Page Source:\*\* Fundamentals of Database Systems Seventh Edition, Page 1150-1151  
Question: What is the main drawback of Discretionary Access Control (DAC) models compared to Mandatory Access Control (MAC)?  
A) DAC is more flexible than MAC  
B) DAC is less flexible than MAC  
C) DAC is more vulnerable to malicious attacks than MAC  
D) DAC requires a strict classification of subjects and objects into security levels  
  
Answer: C) DAC is more vulnerable to malicious attacks than MAC  
  
\*\*LEVEL 3: Apply\*\*  
\*\*Page Source:\*\* Fundamentals of Database Systems Seventh Edition, Page 1152-1153  
Question: Which type of access control model ensures a high degree of protection by preventing illegal flow of information?  
A) Discretionary Access Control (DAC)  
B) Mandatory Access Control (MAC)  
C) Role-Based Access Control (RBAC)  
D) Label-Based Security  
  
Answer: B) Mandatory Access Control (MAC)  
  
\*\*LEVEL 4: Analyze\*\*  
\*\*Page Source:\*\* Fundamentals of Database Systems Seventh Edition, Page 1150-1151  
Question: How do Mandatory Access Control (MAC) models differ from Discretionary Access Control (DAC) models in terms of security?  
A) MAC is more flexible than DAC  
B) MAC is less flexible than DAC  
C) MAC provides a higher degree of protection than DAC  
D) MAC requires a strict classification of subjects and objects into security levels  
  
Answer: C) MAC provides a higher degree of protection than DAC  
  
\*\*LEVEL 5: Evaluate\*\*  
\*\*Page Source:\*\* Fundamentals of Database Systems Seventh Edition, Page 1152-1153  
Question: Is Mandatory Access Control (MAC) suitable for military and high-security applications?  
A) Yes  
B) No  
C) It depends on the specific application requirements  
D) There is no mention of MAC suitability in the provided context  
  
Answer: A) Yes  
  
\*\*LEVEL 6: Create\*\*  
\*\*Page Source:\*\* Fundamentals of Database Systems Seventh Edition, Page 1152-1153  
Question: Develop a scenario where Mandatory Access Control (MAC) would be more effective than Discretionary Access Control (DAC) in ensuring security.  
A) In a cloud-based storage service where sensitive data is stored  
B) In a social media platform where user-generated content is shared  
C) In a government agency handling classified information  
D) In an online shopping platform where customer payment information is processed  
  
Answer: C) In a government agency handling classified information

* Question: Create six multiple choice question and answer of the question with the Many-To-Many concept

Response: Here are six multiple-choice questions based on the provided document, covering various difficulty levels:  
  
\*\*Question 1 (Remember):\*\*  
Define the purpose of the FOR clause in a query.  
  
A) To assign a variable to range over each element in a sequence  
B) To specify the join attributes for the next relation  
C) To group the result by an aggregate function  
D) To filter the data based on a condition  
  
Answer: A) To assign a variable to range over each element in a sequence  
  
LEVEL: Remember  
PAGE SOURCE: Page 458  
  
\*\*Question 2 (Understand):\*\*  
Describe how dynamic programming can be used for query optimization.  
  
A) By applying a heuristic approach to reduce the solution space  
B) By using a non-heuristic exhaustive approach to evaluate all options  
C) By solving sub-problems and reusing solutions to avoid revisiting previous plans  
D) By sorting the result of the join based on a specific attribute  
  
Answer: C) By solving sub-problems and reusing solutions to avoid revisiting previous plans  
  
LEVEL: Understand  
PAGE SOURCE: Page 739  
  
\*\*Question 3 (Apply):\*\*  
Solve for the total number of options considered in the non-heuristic exhaustive approach.  
  
A) 6 + 6  
B) 120  
C) 36  
D) 2  
  
Answer: B) 120  
  
LEVEL: Apply  
PAGE SOURCE: Page 739  
  
\*\*Question 4 (Analyze):\*\*  
Compare the benefits of using System R's approach for finding the best join order.  
  
A) It reduces the solution space and avoids revisiting previous plans  
B) It increases the complexity of the query optimization process  
C) It only considers the join attributes of the later join  
D) It does not consider the grouping attributes of a later GROUP BY or sort order  
  
Answer: A) It reduces the solution space and avoids revisiting previous plans  
  
LEVEL: Analyze  
PAGE SOURCE: Page 738  
  
\*\*Question 5 (Evaluate):\*\*  
Justify why aggregate functions can be used in selection conditions involving nested queries.  
  
A) To filter the data based on an aggregate value  
B) To group the result by an aggregate function  
C) To specify the join attributes for the next relation  
D) To sort the result of the join based on a specific attribute  
  
Answer: A) To filter the data based on an aggregate value  
  
LEVEL: Evaluate  
PAGE SOURCE: Page 231  
  
\*\*Question 6 (Create):\*\*  
Modify Query 5 to include only employees who have exactly two dependents.  
  
A) Q5: SELECT Lname, Fname FROM EMPLOYEE WHERE (SELECT COUNT(\*) FROM DEPENDENT WHERE Ssn = Essn ) = 2;  
B) Q5: SELECT Lname, Fname FROM EMPLOYEE WHERE (SELECT COUNT(\*) FROM DEPENDENT WHERE Ssn = Essn ) < 3;  
C) Q5: SELECT Lname, Fname FROM EMPLOYEE WHERE (SELECT COUNT(\*) FROM DEPENDENT WHERE Ssn = Essn ) > 2;  
D) Q5: SELECT Lname, Fname FROM EMPLOYEE WHERE (SELECT COUNT(\*) FROM DEPENDENT WHERE Ssn = Essn ) >= 1;  
  
Answer: A) Q5: SELECT Lname, Fname FROM EMPLOYEE WHERE (SELECT COUNT(\*) FROM DEPENDENT WHERE Ssn = Essn ) = 2;  
  
LEVEL: Create  
PAGE SOURCE: Page 231

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

Response: Here are six multiple-choice questions based on the given context:  
  
\*\*LEVEL 1: Remember\*\*  
Question: What is the preferred index for range queries in a database system?  
A) Primary key  
B) Range partitioned  
C) Secondary index  
D) Hash index  
Answer: B) Range partitioned  
  
(PAGE SOURCE: 899)  
  
\*\*LEVEL 2: Understand\*\*  
Question: Why is dynamic programming useful in query optimization?  
A) To reduce the solution space  
B) To increase the number of options considered  
C) To improve the performance of join operations  
D) To optimize the order of joins  
Answer: A) To reduce the solution space  
  
(PAGE SOURCE: 740)  
  
\*\*LEVEL 3: Apply\*\*  
Question: How does the apriori algorithm use the antimonotonicity property?  
A) By eliminating large itemsets from consideration  
B) By extending frequent itemsets to create candidate frequent itemsets  
C) By grouping similar items together  
D) By sorting items in a specific order  
Answer: A) By eliminating large itemsets from consideration  
  
(PAGE SOURCE: 1089)  
  
\*\*LEVEL 4: Analyze\*\*  
Question: What is the advantage of using the apriori algorithm over non-heuristic approaches?  
A) It reduces the number of options considered  
B) It increases the efficiency of the query optimization process  
C) It allows for dynamic programming to be used  
D) It considers only the join attributes of the later join  
Answer: A) It reduces the number of options considered  
  
(PAGE SOURCE: 740)  
  
\*\*LEVEL 5: Evaluate\*\*  
Question: How does the named entity extractor contribute to candidate answer generation?  
A) By extracting answers from retrieved passages  
B) By matching patterns against desired answer types  
C) By ranking answers based on their relevance  
D) By filtering out irrelevant answers  
Answer: A) By extracting answers from retrieved passages  
  
(PAGE SOURCE: 1077)  
  
\*\*LEVEL 6: Create\*\*  
Question: What is the purpose of surface pattern matching in candidate answer generation?  
A) To extract answers from retrieved passages  
B) To match patterns against desired answer types  
C) To rank answers based on their relevance  
D) To filter out irrelevant answers  
Answer: A) To extract answers from retrieved passages  
  
(PAGE SOURCE: 1077)  
  
Please note that these questions are generated based on the provided context and may not be exact replicas of the original text.

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

Response: Here are six multiple-choice questions based on the Minimal Cover concept:  
  
\*\*LEVEL: Understand\*\*  
\*\*PAGE SOURCE:\*\* 524  
  
\*\*Question 1: Define\*\*  
What is a minimal cover in the context of functional dependencies?  
  
A) A set of functional dependencies that can be used to infer all other dependencies  
B) A set of functional dependencies that has no redundant dependencies  
C) A set of functional dependencies that satisfies the property of every dependency being in its closure  
D) A set of functional dependencies that is equivalent to the original set  
  
\*\*Answer:\*\* B) A set of functional dependencies that has no redundant dependencies  
  
\*\*LEVEL: Apply\*\*  
\*\*PAGE SOURCE:\*\* 524  
  
\*\*Question 2: Solve\*\*  
Given a set of functional dependencies E, how would you find a minimal cover F for it?  
  
A) By adding more dependencies to E  
B) By replacing each dependency in E with multiple smaller ones  
C) By removing redundant dependencies from E  
D) By keeping the original set E as is  
  
\*\*Answer:\*\* C) By removing redundant dependencies from E  
  
\*\*LEVEL: Analyze\*\*  
\*\*PAGE SOURCE:\*\* 524  
  
\*\*Question 3: Compare\*\*  
What are some criteria for choosing a minimal cover among multiple possible minimal covers?  
  
A) Only consider the number of dependencies in each cover  
B) Only consider the total length of each cover  
C) Consider both the number and total length of each cover  
D) There is no additional criterion needed  
  
\*\*Answer:\*\* C) Consider both the number and total length of each cover  
  
\*\*LEVEL: Evaluate\*\*  
\*\*PAGE SOURCE:\*\* 524  
  
\*\*Question 4: Justify\*\*  
Why would you want to find a minimal cover for a set of functional dependencies?  
  
A) To make the dependencies easier to understand  
B) To remove redundant information from the database  
C) To ensure that all dependencies are covered by the minimal cover  
D) To reduce the size of the database  
  
\*\*Answer:\*\* B) To remove redundant information from the database  
  
\*\*LEVEL: Create\*\*  
\*\*PAGE SOURCE:\*\* 524  
  
\*\*Question 5: Generate\*\*  
How would you represent a functional dependency in a canonical form for subsequent testing?  
  
A) By concatenating all attributes together  
B) By separating each attribute with a comma  
C) By replacing each dependency with multiple smaller ones  
D) By removing any extraneous attributes from the dependency  
  
\*\*Answer:\*\* C) By replacing each dependency with multiple smaller ones  
  
\*\*LEVEL: Create\*\*  
\*\*PAGE SOURCE:\*\* 524  
  
\*\*Question 6: Modify\*\*  
How would you modify a set of functional dependencies E to create a minimal cover F?  
  
A) By adding more dependencies to E  
B) By removing redundant dependencies from E  
C) By replacing each dependency in E with multiple smaller ones  
D) By keeping the original set E as is  
  
\*\*Answer:\*\* B) By removing redundant dependencies from E

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

Response: Here are six multiple-choice questions based on the context of the Natural Join concept:  
  
\*\*Question 1: LEVEL 2, PAGE SOURCE: RDB.pdf\*\*  
What is the primary purpose of a Natural Join operation?  
  
A) To combine two or more relations based on a common attribute  
B) To eliminate duplicate tuples from a relation  
C) To generate all possible tuple combinations using CARTESIAN PRODUCT  
D) To rename attributes in a relation  
  
\*\*Answer:\*\* A) To combine two or more relations based on a common attribute  
  
\*\*Question 2: LEVEL 3, PAGE SOURCE: RDB.pdf\*\*  
What is the condition for applying a Natural Join operation?  
  
A) The join attributes must have identical values  
B) The join attributes must have different names in both relations  
C) The join attributes must have the same name in both relations  
D) The join attributes must be domain-compatible  
  
\*\*Answer:\*\* C) The join attributes must have the same name in both relations  
  
\*\*Question 3: LEVEL 4, PAGE SOURCE: RDB.pdf\*\*  
What is the result of applying a NATURAL JOIN operation to two relations?  
  
A) A new relation with all possible tuple combinations  
B) A single joined table combining each tuple from both relations  
C) A relation with only unique tuples after eliminating duplicates  
D) A relation with only attributes that have identical values  
  
\*\*Answer:\*\* B) A single joined table combining each tuple from both relations  
  
\*\*Question 4: LEVEL 5, PAGE SOURCE: RDB.pdf\*\*  
What is the benefit of using a NATURAL JOIN operation?  
  
A) It reduces the number of tuples in the resulting relation  
B) It eliminates duplicate attributes in the resulting relation  
C) It combines each tuple from two or more relations based on common attributes  
D) It renames all attributes in one of the relations  
  
\*\*Answer:\*\* C) It combines each tuple from two or more relations based on common attributes  
  
\*\*Question 5: LEVEL 6, PAGE SOURCE: RDB.pdf\*\*  
How can a NATURAL JOIN operation be extended to join more than two relations?  
  
A) By applying multiple NATURAL JOIN operations sequentially  
B) By using the CARTESIAN PRODUCT operation followed by filtering  
C) By nesting join specifications to create a multiway join  
D) By renaming all attributes in one of the relations  
  
\*\*Answer:\*\* C) By nesting join specifications to create a multiway join  
  
\*\*Question 6: LEVEL 1, PAGE SOURCE: RDB.pdf\*\*  
Define NATURAL JOIN.  
  
A) A type of outer join operation  
B) An operation that combines each tuple from two or more relations based on common attributes  
C) A technique for eliminating duplicate tuples in a relation  
D) A method for renaming all attributes in one of the relations  
  
\*\*Answer:\*\* B) An operation that combines each tuple from two or more relations based on common attributes

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

Response: Here are six multiple-choice questions based on the context:  
  
\*\*LEVEL 1. Remember\*\*  
Question: Define normalization in the context of database design.  
A) A process of adding redundancy to a relation schema  
B) A formal framework for analyzing relation schemas based on their keys and functional dependencies  
C) A method of minimizing data inconsistencies in a database  
D) A technique of decomposing a relation schema into smaller, more manageable pieces  
  
Answer: B) A formal framework for analyzing relation schemas based on their keys and functional dependencies  
  
\*\*LEVEL 2. Understand\*\*  
Question: Explain the purpose of normalization in database design.  
A) To add redundancy to a relation schema  
B) To minimize data inconsistencies and redundant information  
C) To decompose a relation schema into smaller, more manageable pieces  
D) To improve query performance in a database  
  
Answer: B) To minimize data inconsistencies and redundant information  
  
\*\*LEVEL 3. Apply\*\*  
Question: Apply the concept of normalization to a scenario where you have two relations: Students (StudentID, Name, Address) and Courses (CourseID, CourseName).  
A) Normalize the relation schemas by adding primary keys  
B) Decompose the relation schemas into smaller, more manageable pieces  
C) Eliminate any redundancy in the attribute values  
D) Merge the two relations into a single, larger table  
  
Answer: B) Decompose the relation schemas into smaller, more manageable pieces  
  
\*\*LEVEL 4. Analyze\*\*  
Question: Compare and contrast the different normal forms (1NF, 2NF, 3NF, etc.) in terms of their application to database design.  
A) Each normal form is a step-by-step process for achieving data consistency  
B) The higher the normal form number, the more complex the normalization process  
C) The different normal forms are mutually exclusive and cannot be combined  
D) The different normal forms are hierarchical, with each higher normal form building on the previous one  
  
Answer: D) The different normal forms are hierarchical, with each higher normal form building on the previous one  
  
\*\*LEVEL 5. Evaluate\*\*  
Question: Justify whether a database design that is in 3NF but not in BCNF is considered to be well-designed.  
A) Yes, because it meets the 3NF condition  
B) No, because it does not meet the BCNF condition  
C) Maybe, depending on the specific requirements of the application  
D) It depends on whether the design is stable or not  
  
Answer: B) No, because it does not meet the BCNF condition  
  
\*\*LEVEL 6. Create\*\*  
Question: Generate a scenario where you would use the concept of normalization to optimize a database design for a web-based e-commerce application.  
A) A small online store with a few products and customers  
B) A large online marketplace with millions of products and users  
C) A database for tracking employee information in a small company  
D) A database for managing inventory levels in a retail store  
  
Answer: B) A large online marketplace with millions of products and users

* Question: Create six multiple choice question and answer of the question with the One-To-Many concept

Response: Here are six multiple-choice questions and answers based on the context:  
  
\*\*Level 1: Remember\*\*  
Question: Define the FOR clause in a query.A) Assigns multiple variablesB) Specifies the sequence to be queriedC) Filters out irrelevant dataD) Orders the results of a queryAnswer: B) Specifies the sequence to be queried  
  
LEVEL: REMEMBER  
PAGE SOURCE: 458

* Question: Create six multiple choice question and answer of the question with the One-To-One concept

Response: Here are six multiple-choice questions based on the given text:  
  
\*\*LEVEL 1 - Remember\*\*  
\*\*PAGE SOURCE:\*\* Chapter 19 Query Optimization, page 740  
  
Q: What is the main idea behind dynamic programming in query optimization?  
A) To reduce the number of options considered for each join  
B) To increase the number of plans evaluated for a query  
C) To optimize the order in which the result of the join is generated  
D) To use a sort-merge join with the next relation  
  
Answer: A) To reduce the number of options considered for each join  
  
\*\*LEVEL 2 - Understand\*\*  
\*\*PAGE SOURCE:\*\* Distributed Concurrency Control, page 870  
  
Q: What is the characteristic of the voting method in distributed concurrency control?  
A) It uses a distinguished copy to maintain locks  
B) It requires a majority of votes granting a lock within a certain time-out period  
C) It does not use a distinguished copy; rather, each copy maintains its own lock  
D) It cancels a transaction if it does not receive a majority of votes  
  
Answer: C) It does not use a distinguished copy; rather, each copy maintains its own lock  
  
\*\*LEVEL 3 - Apply\*\*  
\*\*PAGE SOURCE:\*\* Chapter 25, page ? (not specified)  
  
Q: What type of question can be answered by pinpointing the right phrase in a document or database?  
A) Factoid Questions  
B) Definition Questions  
C) Hypothetical Questions  
D) Rhetorical Questions  
  
Answer: A) Factoid Questions  
  
\*\*LEVEL 4 - Analyze\*\*  
\*\*PAGE SOURCE:\*\* Distributed Concurrency Control, page 870  
  
Q: How does the voting method in distributed concurrency control differ from other methods?  
A) It uses a central coordinator to manage locks  
B) It requires a majority of votes granting a lock within a certain time-out period  
C) It does not use a distinguished copy; rather, each copy maintains its own lock and can grant or deny requests  
D) It cancels a transaction if it does not receive a majority of votes  
  
Answer: C) It does not use a distinguished copy; rather, each copy maintains its own lock and can grant or deny requests  
  
\*\*LEVEL 5 - Evaluate\*\*  
\*\*PAGE SOURCE:\*\* Chapter 25, page ? (not specified)  
  
Q: What are the main concepts involved in question answering systems?  
A) Natural Language Processing and Information Retrieval  
B) Database Systems and Query Optimization  
C) Big Data Tools and Technologies  
D) Machine Learning and Artificial Intelligence  
  
Answer: A) Natural Language Processing and Information Retrieval  
  
\*\*LEVEL 6 - Create\*\*  
\*\*PAGE SOURCE:\*\* None specified (new question)  
  
Q: How can big data tools and technologies be applied to answer factoid questions?  
A) By using a search engine like Google or Bing  
B) By implementing a Named Entity Extractor algorithm  
C) By parsing the question and matching it against retrieved passages  
D) By developing a custom-built database system  
  
Answer: A) By using a search engine like Google or Bing

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

Response: Here are six multiple-choice questions based on the partial concept "Types of Questions" in the given context:  
  
\*\*LEVEL: Understand\*\*  
\*\*PAGE SOURCE: 1075, 1076\*\*  
  
1. What is the primary consideration in question answering systems?  
A) The type of question being asked  
B) The complexity of the database  
C) The speed of the search query  
D) The relevance of the results  
  
Answer: A) The type of question being asked  
  
2. Which type of question pinpoints the right phrase in a document or database that correctly addresses the question?  
A) Definition Questions  
B) Factoid Questions  
C) Opinion Questions  
D) Contextual Questions  
  
Answer: B) Factoid Questions  
  
3. What is the purpose of categorizing questions into different types in question answering systems?  
A) To simplify the search process  
B) To provide accurate results  
C) To rely heavily on the type of questions being asked  
D) To prioritize certain questions over others  
  
Answer: C) To rely heavily on the type of questions being asked  
  
4. Which type of question asks about the definition and meaning of a concept, and to extract essential information and properties?  
A) Factoid Questions  
B) Definition Questions  
C) Opinion Questions  
D) Contextual Questions  
  
Answer: B) Definition Questions  
  
5. What is the purpose of joint initiatives in research and academia advocating common metrics, architectures, tools, and methodologies for question answering techniques?  
A) To improve the accuracy of results  
B) To simplify the search process  
C) To create baselines that facilitate and improve the QA technique  
D) To prioritize certain questions over others  
  
Answer: C) To create baselines that facilitate and improve the QA technique  
  
6. What is the primary goal of question answering systems?  
A) To provide accurate results  
B) To simplify the search process  
C) To categorize questions into different types  
D) To answer opinion-based questions  
  
Answer: A) To provide accurate results

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

Response: Here are six multiple-choice questions and answers based on the concept of Participation Constraints:  
  
\*\*LEVEL 1: Remember\*\*  
Question: What is the participation constraint that specifies whether the existence of an entity depends on its being related to another entity via the relationship type?  
A) Total Participation  
B) Partial Participation  
C) Existence Dependency  
D) Structural Constraint  
  
Answer: C) Existence Dependency  
Level: 1  
Page Source: Page 90, Fundamentals of Database Systems Seventh Edition

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

Response: Here are six multiple-choice questions based on the context:  
  
\*\*LEVEL 3. Understand\*\*  
\*\*PAGE SOURCE\*\*  
  
1. What is the PRIMARY KEY clause used for in a CREATE TABLE statement?  
  
A) To specify the alternate key of a relation  
B) To specify one or more attributes that make up the primary key of a relation  
C) To specify the unique key of a relation  
D) To specify the foreign key of a relation  
  
Answer: B) To specify one or more attributes that make up the primary key of a relation  
  
\*\*LEVEL 4. Analyze\*\*  
\*\*PAGE SOURCE\*\*  
  
2. What is the purpose of specifying a PRIMARY KEY in a table?  
  
A) To ensure uniqueness of values  
B) To establish a foreign key relationship with another table  
C) To create an index on the attribute  
D) To identify the primary key of a relation  
  
Answer: D) To identify the primary key of a relation  
  
\*\*LEVEL 2. Remember\*\*  
\*\*PAGE SOURCE\*\*  
  
3. What is the PRIMARY KEY clause used for in Figure 6.1.7?  
  
A) To specify alternate keys  
B) To specify primary keys  
C) To specify foreign keys  
D) To specify candidate keys  
  
Answer: B) To specify primary keys  
  
\*\*LEVEL 5. Evaluate\*\*  
\*\*PAGE SOURCE\*\*  
  
4. What is the difference between a PRIMARY KEY and an UNIQUE KEY in a table?  
  
A) A PRIMARY KEY can have multiple attributes, while a UNIQUE KEY cannot  
B) A PRIMARY KEY identifies the primary key of a relation, while a UNIQUE KEY ensures uniqueness of values  
C) A PRIMARY KEY is used for hashing, while a UNIQUE KEY is used for ordering  
D) A PRIMARY KEY is used for sorting, while a UNIQUE KEY is used for filtering  
  
Answer: B) A PRIMARY KEY identifies the primary key of a relation, while a UNIQUE KEY ensures uniqueness of values  
  
\*\*LEVEL 6. Create\*\*  
\*\*PAGE SOURCE\*\*  
  
5. Design a new table with a PRIMARY KEY that consists of two attributes, one for hashing and another for ordering.  
  
A)  
B)   
C)   
D)  
  
Answer: (A) The primary key would consist of two attributes, `ItemID` for hashing and `Date` or `Timestamp` for ordering.  
  
\*\*LEVEL 1. Remember\*\*  
\*\*PAGE SOURCE\*\*  
  
6. What is the PRIMARY KEY clause used for in DynamoDB?  
  
A) To specify a unique attribute  
B) To specify a hash type primary key  
C) To specify a range type primary key  
D) To specify a composite primary key  
  
Answer: B) To specify a hash type primary key

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

Response: Here are six multiple-choice questions based on the text:  
  
\*\*Question 1 (Remember)\*\*  
Define a prime attribute.  
  
A) A single value that represents an entity.  
B) A composite attribute that can be further decomposed.  
C) An attribute that is not part of any composite attribute.  
D) An attribute that has no meaning without its component attributes.  
  
Answer: C) An attribute that has no meaning without its component attributes.  
  
\*\*LEVEL: Remember\*\*  
\*\*PAGE SOURCE:\*\* 420  
  
\*\*Question 2 (Understand)\*\*  
Explain the significance of identifying prime attributes in database design.  
  
A) It helps to reduce data redundancy.  
B) It ensures that all entities are uniquely identified.  
C) It simplifies the process of creating relationships between entities.  
D) It enables efficient querying and retrieval of data.  
  
Answer: A) It helps to reduce data redundancy.  
  
\*\*LEVEL: Understand\*\*  
\*\*PAGE SOURCE:\*\* 420  
  
\*\*Question 3 (Apply)\*\*  
Solve for a given entity, say "Student", whether its attribute "Name" is prime or not. Assume that the attribute "Name" can be further decomposed into "First\_name", "Middle\_initial", and "Last\_name".  
  
A) Prime  
B) Not Prime  
C) Depends on the context  
D) Cannot be determined  
  
Answer: B) Not Prime  
  
\*\*LEVEL: Apply\*\*  
\*\*PAGE SOURCE:\*\* 420  
  
\*\*Question 4 (Analyze)\*\*  
Compare and contrast composite and prime attributes.  
  
A) Composite attributes are always prime, while prime attributes are never composite.  
B) Composite attributes can be prime, but not vice versa.  
C) Both composite and prime attributes have the same characteristics.  
D) Prime attributes are always single values, while composite attributes have multiple values.  
  
Answer: B) Composite attributes can be prime, but not vice versa.  
  
\*\*LEVEL: Analyze\*\*  
\*\*PAGE SOURCE:\*\* 420  
  
\*\*Question 5 (Evaluate)\*\*  
Justify whether a multivalued attribute "Height" is considered prime or not. Assume that the attribute "Height" has no meaning without its component values.  
  
A) Prime  
B) Not Prime  
C) Depends on the context  
D) Cannot be determined  
  
Answer: B) Not Prime  
  
\*\*LEVEL: Evaluate\*\*  
\*\*PAGE SOURCE:\*\* 420  
  
\*\*Question 6 (Create)\*\*  
Generate a scenario where a prime attribute "Phone\_number" is used to uniquely identify an entity, say "Employee".  
  
A) A single employee with multiple phone numbers.  
B) Multiple employees sharing the same phone number.  
C) Each employee has a unique phone number.  
D) Phone number is not a suitable identifier.  
  
Answer: C) Each employee has a unique phone number.  
  
\*\*LEVEL: Create\*\*  
\*\*PAGE SOURCE:\*\* 420

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

Response: Here are six multiple-choice questions based on the Projection concept:  
  
\*\*Remember (LEVEL 1, PAGE SOURCE: 742)\*\*  
  
Question: Define projection in database systems.  
  
A) A query that retrieves a subset of data from a database  
B) A process that transforms an image into another form  
C) A technique used to estimate the size of a result set  
D) A method for indexing video segments  
  
Answer: A) A query that retrieves a subset of data from a database  
  
\*\*Understand (LEVEL 2, PAGE SOURCE: 742)\*\*  
  
Question: Explain how SQL treats projection operations.  
  
A) As a multiset, allowing duplicates in the result  
B) As a set, eliminating duplicates in the result  
C) As a list, returning only a fixed number of tuples  
D) As a table, preserving the original data structure  
  
Answer: A) As a multiset, allowing duplicates in the result  
  
\*\*Apply (LEVEL 3, PAGE SOURCE: Not applicable)\*\*  
  
Question: If the DISTINCT option is used in a projection operation, what is the estimated size of the result?  
  
A) |R|  
B) NDV (A, R)  
C) The number of tuples in the original table  
D) The number of unique values in attribute A  
  
Answer: B) NDV (A, R)  
  
\*\*Analyze (LEVEL 4, PAGE SOURCE: Not applicable)\*\*  
  
Question: Compare and contrast the size estimation for projection operations with and without the DISTINCT option.  
  
A) The distinct option reduces the estimated size of the result  
B) The distinct option increases the estimated size of the result  
C) The size estimation is unaffected by the distinct option  
D) The distinct option only applies to factoid questions  
  
Answer: B) The distinct option increases the estimated size of the result  
  
\*\*Evaluate (LEVEL 5, PAGE SOURCE: Not applicable)\*\*  
  
Question: Justify whether the size estimation for projection operations with the DISTINCT option is justified.  
  
A) Yes, the size estimation is justified because it eliminates duplicates  
B) No, the size estimation is not justified because it assumes all tuples are unique  
C) The justification depends on the specific use case  
D) There is no clear justification for the size estimation  
  
Answer: A) Yes, the size estimation is justified because it eliminates duplicates

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

Response: Here are the questions based on the given context:  
  
\*\*Level 1: Remember\*\*  
\*\*Page Source:\*\* N/A  
Question: Define the purpose of the query function in PHP.  
A) To execute SQL commands  
B) To retrieve data from a database  
C) To modify database schema  
D) To handle errors  
  
Answer: A) To execute SQL commands  
  
\*\*Level 2: Understand\*\*  
\*\*Page Source:\*\* 331  
Question: Explain what the EXISTS and UNIQUE functions do in SQL.  
A) They return the count of tuples in a query result  
B) They check whether the result of a nested query is empty or not  
C) They modify the schema of a database table  
D) They handle errors in a query execution  
  
Answer: B) They check whether the result of a nested query is empty or not  
  
\*\*Level 3: Apply\*\*  
\*\*Page Source:\*\* 318  
Question: Solve the problem using cursors to process a query result with multiple records.  
A) Use a loop to iterate over the tuples in the query result  
B) Check the value of SQLCODE to determine when all tuples have been processed  
C) Use the FETCH command to move the cursor past the last tuple in the result  
D) All of the above  
  
Answer: D) All of the above  
  
\*\*Level 4: Analyze\*\*  
\*\*Page Source:\*\* N/A  
Question: Compare and contrast the PHP PEAR DB library with other database libraries.  
A) The PHP PEAR DB library offers more features than others  
B) It is less error-prone than other libraries  
C) It provides an alternative to checking for errors after every database command  
D) It is only used for executing SQL commands  
  
Answer: C) It provides an alternative to checking for errors after every database command  
  
\*\*Level 5: Evaluate\*\*  
\*\*Page Source:\*\* N/A  
Question: Justify the use of cursors in processing a query result with multiple records.  
A) Cursors provide a way to iterate over the tuples in the query result  
B) They allow for more efficient processing of large query results  
C) They can be used to modify the schema of a database table  
D) They are only useful for simple queries  
  
Answer: A) Cursors provide a way to iterate over the tuples in the query result  
  
\*\*Level 6: Create\*\*  
\*\*Page Source:\*\* N/A  
Question: Modify the code snippet shown in Figure 11.6 to create a new table with five attributes instead of four.  
A) Add another CREATE TABLE statement  
B) Modify the existing CREATE TABLE statement  
C) Use a different SQL command to create the table  
D) None of the above  
  
Answer: B) Modify the existing CREATE TABLE statement

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

Response: Here are six multiple-choice questions based on the context about the Read Committed concept:  
  
\*\*Question 1: LEVEL 2, PAGE SOURCE: 797\*\*  
Define Read Committed.  
  
A) A locking mechanism that allows only one transaction to write an item at a time.  
B) A concurrency control mechanism that ensures all transactions read the same version of data.  
C) A database isolation level that reads the most recent committed value for each data item.  
D) A method of handling conflicts between multiple transactions accessing the same data.  
  
Answer: C) A database isolation level that reads the most recent committed value for each data item.  
  
\*\*Question 2: LEVEL 3, PAGE SOURCE: 798\*\*  
Explain why read operations on the same item by different transactions are not conflicting under the Read Committed concept.  
  
A) Because all transactions read the same version of data.  
B) Because read locks are used to prevent concurrent updates.  
C) Because only one transaction can write an item at a time.  
D) Because the most recent committed value is always returned for each data item.  
  
Answer: D) Because the most recent committed value is always returned for each data item.  
  
\*\*Question 3: LEVEL 4, PAGE SOURCE: 798\*\*  
Compare and contrast read-write locks with shared/exclusive locks in the context of Read Committed.  
  
A) Shared/exclusive locks are used to prevent concurrent updates, while read-write locks are used for reading.  
B) Read-write locks are used to ensure serializability, while shared/exclusive locks are used for concurrency control.  
C) Shared/exclusive locks are used for writing, and read-write locks are used for reading.  
D) Both types of locks are used for both reading and writing.  
  
Answer: C) Shared/exclusive locks are used for writing, and read-write locks are used for reading.  
  
\*\*Question 4: LEVEL 5, PAGE SOURCE: 811\*\*  
Justify why the Read Committed concept avoids cascading aborts in a transaction.  
  
A) Because only one transaction can write an item at a time.  
B) Because all transactions read the same version of data.  
C) Because the most recent committed value is always returned for each data item, ensuring that all transactions see consistent results.  
D) Because transactions are restarted if validation fails.  
  
Answer: C) Because the most recent committed value is always returned for each data item, ensuring that all transactions see consistent results.  
  
\*\*Question 5: LEVEL 6, PAGE SOURCE: 787\*\*  
Develop a scenario where deadlocks may occur in the Read Committed concept and how they can be handled.  
  
A) When multiple transactions are reading the same data item simultaneously.  
B) When one transaction is writing an item while another transaction is updating the same item.  
C) When a transaction is waiting for a lock to be released, while another transaction holds the lock.  
D) When a transaction's commit fails due to concurrent updates.  
  
Answer: C) When a transaction is waiting for a lock to be released, while another transaction holds the lock. This can occur when two transactions are holding each other's locks, causing a deadlock.  
  
\*\*Question 6: LEVEL 1, PAGE SOURCE: 787\*\*  
Define what "read-only" mode means in the context of Read Committed.  
  
A) The ability for a transaction to read and update data simultaneously.  
B) A lock type that allows multiple transactions to access the same data item.  
C) A mode where only one transaction can read an item at a time.  
D) A mode where a transaction cannot update any data items.  
  
Answer: D) A mode where a transaction cannot update any data items.

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

Response: Here are six multiple-choice questions based on the context:  
  
\*\*Question 1: Remember\*\*  
LEVEL: Understand  
PAGE SOURCE: 788  
  
What is the default isolation level in SQL?  
A) READ UNCOMMITTED  
B) READ COMMITTED  
C) SERIALIZABLE  
D) REPEATABLE READ  
  
Answer: C) SERIALIZABLE  
  
\*\*Question 2: Understand\*\*  
LEVEL: Understand  
PAGE SOURCE: 788  
  
What happens when a transaction is initiated with the isolation level of READ UNCOMMITTED?  
A) The access mode defaults to READ WRITE  
B) The access mode defaults to READ ONLY  
C) The default isolation level remains SERIALIZABLE  
D) The diagnostic area size increases by one condition  
  
Answer: B) The access mode defaults to READ ONLY  
  
\*\*Question 3: Apply\*\*  
LEVEL: Apply  
PAGE SOURCE: 788  
  
If a transaction is set to READ UNCOMMITTED, what type of lock would be used for writing an item X?  
A) Read-lock (X)  
B) Write-lock (X)  
C) Multiple-mode lock (X)  
D) Unlock(X)  
  
Answer: C) Multiple-mode lock (X)  
  
\*\*Question 4: Analyze\*\*  
LEVEL: Analyze  
PAGE SOURCE: 788  
  
How does the isolation level of READ UNCOMMITTED affect the access mode?  
A) It sets the access mode to READ WRITE  
B) It sets the access mode to READ ONLY  
C) It leaves the access mode unchanged  
D) It increases the diagnostic area size by one condition  
  
Answer: B) It sets the access mode to READ ONLY  
  
\*\*Question 5: Evaluate\*\*  
LEVEL: Evaluate  
PAGE SOURCE: 788  
  
What are the three locking operations used in the shared/exclusive (read/write) lock scheme?  
A) Read-lock (X), Write-lock (X), and Unlock(X)  
B) Read-only, Write-only, and Lock(X)  
C) read-locked, write-locked, and unlocked  
D) READ WRITE, READ ONLY, and COMMIT  
  
Answer: C) read-locked, write-locked, and unlocked  
  
\*\*Question 6: Create\*\*  
LEVEL: Create  
PAGE SOURCE: None  
  
Design a scenario where the isolation level of READ UNCOMMITTED is used to improve database performance. Assume multiple transactions are concurrently accessing an item X.  
A) Implementing a real-time analytics system for stock prices  
B) Processing payment transactions in an e-commerce platform  
C) Updating customer information in a CRM system  
D) Generating recommendations for online shopping  
  
Answer: A) Implementing a real-time analytics system for stock prices

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

Response: Here are six multiple-choice questions based on the context about Relations:  
  
\*\*Remember Level\*\*  
  
1. Question: Define a foreign key.  
A) A candidate key in another relation  
B) A primary key included in two relations  
C) A relationship between two tuples that have the same value for A and B  
D) A pointer to the location of a tuple on disk  
  
Answer: B) A primary key included in two relations (LEVEL: Remember, PAGE SOURCE: 310)  
  
\*\*Understand Level\*\*  
  
2. Question: Explain why a relation is not sensitive to the ordering of tuples.  
A) Because tuples are physically stored on disk  
B) Because elements of a set have no order among them  
C) Because a relation is only used for query purposes  
D) Because there is always an order among records  
  
Answer: B) Because elements of a set have no order among them (LEVEL: Understand, PAGE SOURCE: 167)  
  
\*\*Apply Level\*\*  
  
3. Question: Solve the following scenario: Two tuples in S and T are related when they have the same value for A and B. What operation can be used to combine all pairs of related tuples from S and T and materialize the relationship?  
A) INNER JOIN  
B) EQUIJOIN (or NATURAL JOIN)  
C) LEFT OUTER JOIN  
D) RIGHT OUTER JOIN  
  
Answer: B) EQUIJOIN (or NATURAL JOIN) (LEVEL: Apply, PAGE SOURCE: 310)  
  
\*\*Analyze Level\*\*  
  
4. Question: Compare the following scenarios: A ternary relationship and three binary relationships that cannot replace a ternary relationship.  
A) Both can replace each other  
B) The ternary relationship is more efficient  
C) Three binary relationships can replace a ternary relationship under certain additional constraints  
D) None of the above  
  
Answer: C) Three binary relationships can replace a ternary relationship under certain additional constraints (LEVEL: Analyze, PAGE SOURCE: 104)  
  
\*\*Evaluate Level\*\*  
  
5. Question: Justify whether a weak entity type with a ternary identifying relationship type is possible.  
A) Yes, it is always possible  
B) No, it is never possible  
C) Yes, it is possible under certain conditions  
D) No, it is only possible for simple cases  
  
Answer: C) Yes, it is possible under certain conditions (LEVEL: Evaluate, PAGE SOURCE: 472)  
  
\*\*Create Level\*\*  
  
6. Question: Generate a scenario where a ternary relationship can be replaced by three binary relationships.  
A) A student enrolls in multiple courses  
B) An instructor teaches one course to many students  
C) A project is worked on by multiple employees  
D) A company has multiple branches  
  
Answer: B) An instructor teaches one course to many students (LEVEL: Create, PAGE SOURCE: 104)  
  
Please note that these questions are based on the provided context and may not be exhaustive or perfect.

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

Response: Here are six multiple-choice questions based on the Relational Algebra concept:  
  
\*\*Question 1: LEVEL - Remember\*\*  
Define relational algebra.  
  
A) A query language for databases  
B) A set of operations for querying relations  
C) A data model for database systems  
D) A method for indexing database tables  
  
Answer: B) A set of operations for querying relations  
  
LEVEL: Remember  
PAGE SOURCE: 293  
  
\*\*Question 2: LEVEL - Understand\*\*  
Explain the main distinguishing feature between relational algebra and relational calculus.  
  
A) The order in which operations are applied  
B) The declarative language used to specify queries  
C) The type of data manipulated by each operation  
D) The level of abstraction used in each operation  
  
Answer: B) The declarative language used to specify queries  
  
LEVEL: Understand  
PAGE SOURCE: 253  
  
\*\*Question 3: LEVEL - Apply\*\*  
What is the main use of a relational algebra expression?  
  
A) To update a database table  
B) To query a database and retrieve information  
C) To create a new relation from an existing set of relations  
D) To delete a database record  
  
Answer: B) To query a database and retrieve information  
  
LEVEL: Apply  
PAGE SOURCE: 178  
  
\*\*Question 4: LEVEL - Analyze\*\*  
Compare the two methods for specifying joins in SQL.  
  
A) Using joined tables versus using join conditions in the WHERE clause  
B) Using subqueries versus using aggregate functions  
C) Using views versus using materialized views  
D) Using triggers versus using stored procedures  
  
Answer: A) Using joined tables versus using join conditions in the WHERE clause  
  
LEVEL: Analyze  
PAGE SOURCE: 268  
  
\*\*Question 5: LEVEL - Evaluate\*\*  
Justify why the relational algebra operation {σ, π, ∪, ρ, -, ×} is considered a complete set.  
  
A) Because it includes all possible relational algebra operations  
B) Because it can be used to express any other relational algebra operation as a sequence of operations from this set  
C) Because it is the most commonly used relational algebra operation  
D) Because it is the only way to specify queries in relational databases  
  
Answer: B) Because it can be used to express any other relational algebra operation as a sequence of operations from this set  
  
LEVEL: Evaluate  
PAGE SOURCE: 178  
  
\*\*Question 6: LEVEL - Create\*\*  
Generate an example of how the INTERSECTION operation can be expressed using UNION and MINUS in relational algebra.  
  
A) R ∩ S ≡ (R × S) – ((R - S) ∪ (S - R))  
B) R ∩ S ≡ (R ∪ S) – ((R - S) ∪ (S - R))  
C) R ∩ S ≡ (R × S) ∪ ((R - S) ∪ (S - R))  
D) R ∩ S ≡ (R ∪ S) × ((R - S) ∪ (S - R))  
  
Answer: B) R ∩ S ≡ (R ∪ S) – ((R - S) ∪ (S - R))  
  
LEVEL: Create  
PAGE SOURCE: 268

* Question: Create six multiple choice question and answer of the question with the Relational data model concept

Response: Here are six multiple-choice questions based on the context:  
  
\*\*Question 1: LEVEL - Remember; PAGE SOURCE - 160\*\*  
What is the basic building block of the relational data model?  
  
A) A mathematical equation  
B) A table of values  
C) A set of rules  
D) A logical statement  
  
Answer: B) A table of values

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

Response: Here are six multiple-choice questions and answers based on the context:  
  
\*\*Question 1\*\*  
LEVEL: Remember  
PAGE SOURCE: 104  
  
Define the term "ternary relationship" in the context of database systems.  
  
A) A binary relationship between two entity types.  
B) A relationship involving three or more entity types.  
C) A type of weak entity type.  
D) A concept used to represent a many-to-many relationship.  
  
Answer: B) A relationship involving three or more entity types.  
  
\*\*Question 2\*\*  
LEVEL: Understand  
PAGE SOURCE: 300  
  
Explain why the ternary relationship OFFERED\_DURING is redundant in the context of the CAN\_TEACH, TAUGHT\_DURING, and SUPPLY relationships.  
  
A) Because it can be inferred from the other two binary relationships.  
B) Because it represents a different meaning than the other two relationships.  
C) Because it is not needed by the application.  
D) Because it is a many-to-many relationship.  
  
Answer: A) Because it can be inferred from the other two binary relationships.  
  
\*\*Question 3\*\*  
LEVEL: Apply  
PAGE SOURCE: 420  
  
Specify and execute the query to retrieve the part numbers that are supplied to exactly two projects using the RA interpreter.  
  
A) SELECT Part\_no FROM SUPPLY WHERE Quantity = 2;  
B) SELECT Part\_no FROM SUPPLY WHERE Proj\_name IN (SELECT proj\_name FROM PROJECT WHERE num\_projects = 2);  
C) SELECT Part\_no FROM SUPPLY WHERE Sname IN (SELECT sname FROM SUPPLIER WHERE num\_supplies = 2);  
D) SELECT Part\_no FROM SUPPLY WHERE Quantity > 1 AND Quantity < 3;  
  
Answer: A) SELECT Part\_no FROM SUPPLY WHERE Quantity = 2;  
  
\*\*Question 4\*\*  
LEVEL: Analyze  
PAGE SOURCE: 420  
  
Compare and contrast the binary relationships CAN\_TEACH, TAUGHT\_DURING, and OFFERED\_DURING in terms of their roles and implications.  
  
A) All three are equivalent and can be replaced by each other.  
B) CAN\_TEACH represents a many-to-many relationship, while TAUGHT\_DURING and OFFERED\_DURING represent one-to-one relationships.  
C) TAUGHT\_DURING and OFFERED\_DURING are redundant, while CAN\_TEACH is essential.  
D) All three are necessary to fully capture the semantics of the situation.  
  
Answer: D) All three are necessary to fully capture the semantics of the situation.  
  
\*\*Question 5\*\*  
LEVEL: Evaluate  
PAGE SOURCE: 420  
  
Justify whether a ternary relationship can be replaced by three binary relationships under certain constraints.  
  
A) No, it is always better to use a ternary relationship.  
B) Yes, if the constraints are met and the relationships represent different meanings.  
C) Only in specific situations where the semantics of the situation allow for it.  
D) Never, because ternary relationships are inherently more complex.  
  
Answer: B) Yes, if the constraints are met and the relationships represent different meanings.  
  
\*\*Question 6\*\*  
LEVEL: Create  
PAGE SOURCE: 420  
  
Develop a schema to represent a many-many-many relationship between suppliers, projects, and parts using ternary relationships.  
  
A)  
```  
SUPPLY (Sname, Part\_no, Proj\_name)  
PART (Part\_no)  
PROJECT (Proj\_name)  
SUPPLIER (Sname)  
```  
  
B)  
```  
CAN\_SUPPLY (Sname, Part\_no, Proj\_name)  
PART (Part\_no)  
PROJECT (Proj\_name)  
SUPPLIER (Sname)  
```  
  
C)  
```  
OFFERED\_DURING (Sname, Part\_no, Proj\_name)  
PART (Part\_no)  
PROJECT (Proj\_name)  
SUPPLIER (Sname)  
```  
  
D) None of the above  
  
Answer: A)

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

Response: Here are six multiple-choice questions based on the given context:  
  
\*\*Level 1: Remember\*\*  
  
Question: What is renaming in the context of database systems?  
A) Renaming a relation  
B) Renaming an attribute name  
C) Renaming a query definition  
D) Renaming a named object  
Answer: B) Renaming an attribute name  
  
LEVEL: REMEMBER  
PAGE SOURCE: 425  
  
\*\*Level 2: Understand\*\*  
  
Question: What is the purpose of renaming in database operations?  
A) To change the relation name only  
B) To change either the relation name or the attribute names, or both  
C) To delete a query definition  
D) To create a new named object  
Answer: B) To change either the relation name or the attribute names, or both  
  
LEVEL: UNDERSTAND  
PAGE SOURCE: 259  
  
\*\*Level 3: Apply\*\*  
  
Question: How does the RENAME operation affect the attribute names in a relation?  
A) It renames all attribute names to a single new name  
B) It renames some but not all attribute names  
C) It keeps all attribute names unchanged  
D) It deletes all attribute names  
Answer: B) It renames some but not all attribute names  
  
LEVEL: APPLY  
PAGE SOURCE: 1075  
  
\*\*Level 4: Analyze\*\*  
  
Question: What is the significance of ordering in renaming operations?  
A) The order of joining relations affects the result  
B) The order of sorting data affects the result  
C) The order of renaming attributes affects the result  
D) None of the above  
Answer: C) The order of renaming attributes affects the result  
  
LEVEL: ANALYZE  
PAGE SOURCE: 739  
  
\*\*Level 5: Evaluate\*\*  
  
Question: Is renaming an operation that can change both relation names and attribute names?  
A) Yes, it is possible to rename both  
B) No, it is only possible to rename one or the other  
C) It depends on the context  
D) Renaming is not possible at all  
Answer: A) Yes, it is possible to rename both  
  
LEVEL: EVALUATE  
PAGE SOURCE: 425  
  
\*\*Level 6: Create\*\*  
  
Question: Can you generate a scenario where renaming an attribute name would be useful?  
A) When creating a new named query  
B) When deleting a relation  
C) When renaming an attribute name in a view definition  
D) When sorting data  
Answer: C) When renaming an attribute name in a view definition  
  
LEVEL: CREATE  
PAGE SOURCE: 258

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

Response: Here are six multiple-choice questions based on the text about the REVOKE command:  
  
\*\*Level 2, Page 1144\*\*  
  
Question: What is the purpose of the REVOKE command in SQL?  
  
A) To grant a privilege to a user  
B) To revoke a privilege from a user  
C) To cancel privileges  
D) To grant SELECT privilege on a view  
  
Answer: B) To revoke a privilege from a user  
  
\*\*Level 3, Page 1144\*\*  
  
Question: Why is it desirable to have a mechanism for revoking privileges in SQL?  
  
A) To grant privileges only once  
B) To limit access to certain data items  
C) To cancel privileges temporarily or permanently  
D) To create views on relations  
  
Answer: C) To cancel privileges temporarily or permanently  
  
\*\*Level 4, Page 1144\*\*  
  
Question: How does the REVOKE command differ from the GRANT command in SQL?  
  
A) The REVOKE command grants a privilege while the GRANT command revokes one  
B) The REVOKE command revokes a privilege while the GRANT command grants one  
C) The REVOKE command is used for views only, while the GRANT command is used for relations  
D) The REVOKE command is used for granting privileges to users, while the GRANT command is used for granting privileges to groups  
  
Answer: B) The REVOKE command revokes a privilege while the GRANT command grants one  
  
\*\*Level 5, Page 1144\*\*  
  
Question: What is an example of when it would be desirable to grant a privilege to a user temporarily and then revoke it?  
  
A) When a user needs access to all data items in the database  
B) When a user needs access to specific data items for a specific task  
C) When a user needs access to all views on relations  
D) When a user needs access to all privileges in the database  
  
Answer: B) When a user needs access to specific data items for a specific task  
  
\*\*Level 6, Page 1144\*\*  
  
Question: How can you use the REVOKE command to cancel a privilege that was previously granted?  
  
A) By using the GRANT command with the REVOKE option  
B) By using the REVOKE command with the GRANT option  
C) By using the SQL command "REVOKE FROM" followed by the user name and privilege name  
D) By using the SQL command "GRANT TO" followed by the user name and privilege name  
  
Answer: C) By using the SQL command "REVOKE FROM" followed by the user name and privilege name

* Question: Create six multiple choice question and answer of the question with the Role-Based Access Control (RBAC)

Response: Here are six multiple-choice questions based on the provided text about Role-Based Access Control (RBAC):  
  
\*\*LEVEL 1: Remember\*\*  
  
Question: What is the basic notion in RBAC?  
  
A) Privileges and permissions are associated with individual users.  
B) Privileges and permissions are associated with organizational roles.  
C) Roles can only be assigned to workflow tasks.  
D) Users create sessions during which they may activate a subset of roles.  
  
Answer: B) Privileges and permissions are associated with organizational roles.  
  
LEVEL: 1  
PAGE SOURCE: RDB.pdf  
  
\*\*LEVEL 2: Understand\*\*  
  
Question: What is the primary goal of using an RBAC model?  
  
A) To assign privileges to individual users.  
B) To ensure that only authorized users in their specified roles are given access to certain data or resources.  
C) To implement mandatory access control.  
D) To create a hierarchical organization structure.  
  
Answer: B) To ensure that only authorized users in their specified roles are given access to certain data or resources.  
  
LEVEL: 2  
PAGE SOURCE: RDB.pdf  
  
\*\*LEVEL 3: Apply\*\*  
  
Question: How can RBAC be used with traditional discretionary and mandatory access controls?  
  
A) By assigning roles to individual users.  
B) By ensuring that only authorized users in their specified roles are given access to certain data or resources.  
C) By implementing mutual exclusion of roles.  
D) By creating a hierarchical organization structure.  
  
Answer: B) By ensuring that only authorized users in their specified roles are given access to certain data or resources.  
  
LEVEL: 3  
PAGE SOURCE: RDB.pdf  
  
\*\*LEVEL 4: Analyze\*\*  
  
Question: What is the advantage of using RBAC over DAC and MAC models?  
  
A) It provides better support for security management and administration.  
B) It ensures that only authorized users in their specified roles are given access to certain data or resources.  
C) It is more flexible than DAC and MAC models.  
D) It has a natural enforcement of the hierarchical organization structure.  
  
Answer: A) It provides better support for security management and administration.  
  
LEVEL: 4  
PAGE SOURCE: RDB.pdf  
  
\*\*LEVEL 5: Evaluate\*\*  
  
Question: What is the importance of considering temporal constraints in RBAC systems?  
  
A) To ensure that roles are assigned to individual users.  
B) To prevent one user from doing work that requires the involvement of two or more people.  
C) To address key security requirements and timed triggering of a role by an activation of another role.  
D) To implement mandatory access control.  
  
Answer: C) To address key security requirements and timed triggering of a role by an activation of another role.  
  
LEVEL: 5  
PAGE SOURCE: RDB.pdf  
  
\*\*LEVEL 6: Create\*\*  
  
Question: How can separation of duties be implemented in RBAC systems?  
  
A) By assigning roles to individual users.  
B) By implementing mutual exclusion of roles.  
C) By creating a hierarchical organization structure.  
D) By using the CREATE ROLE and DESTROY ROLE commands.  
  
Answer: B) By implementing mutual exclusion of roles.  
  
LEVEL: 6  
PAGE SOURCE: RDB.pdf

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

Response: Here are six multiple-choice questions based on the given text:  
  
\*\*Question 1:\*\* Define what a catalog is in SQL.  
\*\*LEVEL\*\*: Remember  
\*\*PAGE SOURCE\*\*: Page 193  
  
A) A collection of tables  
B) A named collection of schemas  
C) A type of database installation  
D) A concept related to triggers  
  
\*\*Answer:\*\* B) A named collection of schemas  
  
\*\*Question 2:\*\* Explain how the CHECK clause is used in SQL.  
\*\*LEVEL\*\*: Understand  
\*\*PAGE SOURCE\*\*: Page 240  
  
A) To create a new table  
B) To specify a constraint on individual attributes, domains, or tuples  
C) To define a schema  
D) To grant privileges to users  
  
\*\*Answer:\*\* B) To specify a constraint on individual attributes, domains, or tuples  
  
\*\*Question 3:\*\* Solve the following query: `SELECT E.Fname, E.Lname FROM EMPLOYEE AS E, DEPENDENT AS D WHERE E.Ssn = D.Essn AND E.Sex = D.Sex AND E.Fname = D.Dependent\_name;`  
\*\*LEVEL\*\*: Apply  
\*\*PAGE SOURCE\*\*: Page 226  
  
A) Q16A: `SELECT E.Fname, E.Lname FROM EMPLOYEE AS E, DEPENDENT AS D WHERE E.Ssn = D.Essn AND E.Sex = D.Sex AND E.Fname = D.Dependent\_name;`  
B) Q17: `SELECT \* FROM EMPLOYEE AS E JOIN DEPENDENT AS D ON E.Ssn = D.Essn AND E.Sex = D.Sex AND E.Fname = D.Dependent\_name;`  
C) Q18: `SELECT \* FROM DEPENDENT AS D JOIN EMPLOYEE AS E ON D.Essn = E.Ssn AND D.Sex = E.Sex AND D.Dependent\_name = E.Fname;`  
D) This query is invalid  
  
\*\*Answer:\*\* A) Q16A: `SELECT E.Fname, E.Lname FROM EMPLOYEE AS E, DEPENDENT AS D WHERE E.Ssn = D.Essn AND E.Sex = D.Sex AND E.Fname = D.Dependent\_name;`  
  
\*\*Question 4:\*\* Compare the use of CHECK and CREATE Assertion in SQL.  
\*\*LEVEL\*\*: Analyze  
\*\*PAGE SOURCE\*\*: Page 240  
  
A) The CHECK clause is used to create a new table, while the CREATE Assertion statement is used to specify a constraint on individual attributes, domains, or tuples.  
B) The CHECK clause is used to specify a constraint on individual attributes, domains, or tuples, while the CREATE Assertion statement is used to create a new table.  
C) Both CHECK and CREATE Assertion are used to create a new table.  
D) Neither CHECK nor CREATE Assertion is used to create a new table.  
  
\*\*Answer:\*\* B) The CHECK clause is used to specify a constraint on individual attributes, domains, or tuples, while the CREATE Assertion statement is used to create a new table.  
  
\*\*Question 5:\*\* Justify why the EXISTS function in SQL returns TRUE if the nested query result contains at least one tuple.  
\*\*LEVEL\*\*: Evaluate  
\*\*PAGE SOURCE\*\*: Page 225  
  
A) Because it's a Boolean function that always returns TRUE for any input.  
B) Because the EXISTS function checks whether the result of the nested query is empty or not, and returns TRUE if the result contains at least one tuple.  
C) Because the EXISTS function only returns FALSE when the result of the nested query is empty.  
D) This statement is invalid.  
  
\*\*Answer:\*\* B) Because the EXISTS function checks whether the result of the nested query is empty or not, and returns TRUE if the result contains at least one tuple.  
  
\*\*Question 6:\*\* Generate a SQL query to create a schema called COMPANY owned by the user with authorization identifier ‘Jsmith’.  
\*\*LEVEL\*\*: Create  
\*\*PAGE SOURCE\*\*: Page 193  
  
A) `CREATE SCHEMA COMPANY AUTHORIZATION 'Jsmith';`  
B) `CREATE TABLE COMPANY AUTHORIZATION 'Jsmith';`  
C) `CREATE VIEW COMPANY AUTHORIZATION 'Jsmith';`  
D) This query is invalid  
  
\*\*Answer:\*\* A) `CREATE SCHEMA COMPANY AUTHORIZATION 'Jsmith';`

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

Response: Here are six multiple-choice questions based on the provided text:  
  
\*\*Level:\*\* Understand  
\*\*Page Source:\*\* Page 201  
\*\*Question:\*\* What is the basic form of a SQL query using the SELECT statement?  
  
A) SELECT <attribute list> FROM <table list> WHERE <condition>  
B) SELECT <attribute list> FROM <table list> AND <condition>  
C) SELECT <attribute list> OR <table list> AND <condition>  
D) SELECT <attribute list> NOT <table list> AND <condition>  
  
\*\*Answer:\*\* A) SELECT <attribute list> FROM <table list> WHERE <condition>  
  
\*\*Level:\*\* Apply  
\*\*Page Source:\*\* Page 207  
\*\*Question:\*\* What is the purpose of specifying SELECT DISTINCT in a SQL query?  
  
A) To eliminate duplicate tuples from the result  
B) To include duplicate tuples in the result  
C) To specify the attribute list for the query  
D) To specify the table list for the query  
  
\*\*Answer:\*\* A) To eliminate duplicate tuples from the result  
  
\*\*Level:\*\* Evaluate  
\*\*Page Source:\*\* Page 201  
\*\*Question:\*\* Which of the following clauses is mandatory in a SQL query using the SELECT statement?  
  
A) FROM  
B) WHERE  
C) SELECT  
D) ALL  
  
\*\*Answer:\*\* C) SELECT  
  
\*\*Level:\*\* Create  
\*\*Page Source:\*\* Page 236  
\*\*Question:\*\* How can you specify a correlated nested query with an aggregate function in SQL?  
  
A) By using the COUNT(\*) function  
B) By using the SUM() function  
C) By specifying the attribute list for the query  
D) By using the correlated nested query syntax  
  
\*\*Answer:\*\* D) By using the correlated nested query syntax  
  
\*\*Level:\*\* Remember  
\*\*Page Source:\*\* Page 207  
\*\*Question:\*\* What is the default behavior of a SQL query if you do not specify SELECT ALL or SELECT DISTINCT?  
  
A) It eliminates duplicate tuples from the result  
B) It includes duplicate tuples in the result  
C) It specifies the attribute list for the query  
D) It specifies the table list for the query  
  
\*\*Answer:\*\* C) It specifies the attribute list for the query (equivalent to SELECT ALL)  
  
\*\*Level:\*\* Analyze  
\*\*Page Source:\*\* Page 231  
\*\*Question:\*\* What is the purpose of using aggregate functions SOME and ALL in SQL?  
  
A) To count the number of dependents for each employee  
B) To retrieve the names of all employees who have two or more dependents  
C) To apply Boolean values to a collection  
D) To group tuples based on conditions  
  
\*\*Answer:\*\* C) To apply Boolean values to a collection

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

Response: Here are six multiple-choice questions based on the context:  
  
\*\*Level 1: Remember\*\*  
Q: What is the purpose of using the keyword `DISTINCT` in a SQL query?  
A) To eliminate duplicate tuples from the result  
B) To include only distinct attribute values  
C) To exclude specific attribute values  
D) To specify a specific table to retrieve data from  
  
Answer: A) To eliminate duplicate tuples from the result  
  
LEVEL: Remember  
PAGE SOURCE: 208  
  
\*\*Level 2: Understand\*\*  
Q: What is the effect of using `SELECT DISTINCT` in an SQL query?  
A) It retrieves all attribute values, including duplicates  
B) It eliminates duplicate tuples and returns distinct results  
C) It returns a summary of the data without duplicates  
D) It does not affect the result set  
  
Answer: B) It eliminates duplicate tuples and returns distinct results  
  
LEVEL: Understand  
PAGE SOURCE: 208  
  
\*\*Level 3: Apply\*\*  
Q: Which SQL query would use `SELECT DISTINCT` to retrieve only unique salary values?  
A) Q11 retrieves all employee salaries, including duplicates  
B) Q11A uses `SELECT DISTINCT` to eliminate duplicate salary values  
C) Q12 requires `SELECT ALL` to include all tuples  
D) Q13 needs `SELECT SUM` to calculate the total salary  
  
Answer: B) Q11A uses `SELECT DISTINCT` to eliminate duplicate salary values  
  
LEVEL: Apply  
PAGE SOURCE: 208  
  
\*\*Level 4: Analyze\*\*  
Q: Compare and contrast the effects of using `SELECT ALL` versus `SELECT DISTINCT` in an SQL query.  
A) Both return identical results with duplicates included  
B) `SELECT ALL` includes all tuples, while `SELECT DISTINCT` eliminates duplicates  
C) `SELECT ALL` excludes specific attribute values, whereas `SELECT DISTINCT` returns distinct results  
D) Both have no effect on the result set  
  
Answer: B) `SELECT ALL` includes all tuples, while `SELECT DISTINCT` eliminates duplicates  
  
LEVEL: Analyze  
PAGE SOURCE: 208  
  
\*\*Level 5: Evaluate\*\*  
Q: Justify why using `SELECT DISTINCT` in an SQL query is important when retrieving data.  
A) It simplifies the result set by eliminating duplicate values  
B) It returns a summary of the data without duplicates  
C) It has no effect on the result set  
D) It requires additional processing power  
  
Answer: A) It simplifies the result set by eliminating duplicate values  
  
LEVEL: Evaluate  
PAGE SOURCE: 208  
  
\*\*Level 6: Create\*\*  
Q: Generate an SQL query that uses `SELECT DISTINCT` to retrieve only unique department names from a table.  
A) SELECT DISTINCT Department FROM DEPARTMENTS WHERE Department IS NOT NULL;  
B) SELECT ALL Department FROM DEPARTMENTS WHERE Department IS NULL;  
C) SELECT DISTINCT Department FROM DEPARTMENTS;  
D) SELECT ALL Department FROM DEPARTMENTS;  
  
Answer: A) SELECT DISTINCT Department FROM DEPARTMENTS WHERE Department IS NOT NULL;  
  
LEVEL: Create  
PAGE SOURCE: 208

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

Response: Here are six multiple-choice questions based on the context:  
  
\*\*LEVEL: 2 (Understand)\*\*  
  
Question: What is the main function of the SELECT statement in SQL?  
  
A) To insert new data into a database  
B) To update existing data in a database  
C) To retrieve information from a database  
D) To delete data from a database  
  
Answer: C) To retrieve information from a database  
  
\*\*LEVEL: 3 (Apply)\*\*  
  
  
Question: How does SQL handle a selection based on an equality condition when using range partitioning?  
  
A) It performs the selection on all partitions  
B) It performs the selection only on the partition that matches the value v  
C) It merges the results from each partition  
D) It uses a parallel algorithm to select and merge results  
  
Answer: B) It performs the selection only on the partition that matches the value v  
  
\*\*LEVEL: 4 (Analyze)\*\*  
  
  
Question: How do parallel algorithms handle selections in SQL?  
  
A) They always perform the selection on all partitions  
B) They sometimes perform the selection on a single partition and other times on multiple partitions  
C) They never use parallel algorithms for selection operations  
D) They always merge the results from each partition  
  
Answer: B) They sometimes perform the selection on a single partition and other times on multiple partitions  
  
  
Question: What is the benefit of combining multiple SELECT operations into a single SELECT operation with a conjunctive condition?  
  
A) It reduces the complexity of the query  
B) It increases the speed of the query  
C) It improves the accuracy of the results  
D) It simplifies the SQL code  
  
Answer: D) It simplifies the SQL code

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

Response: Here are six multiple-choice questions and answers based on the context:  
  
\*\*Level: Remember, Page Source: 783\*\*  
Question: Define serializability in transaction processing.  
A) A schedule where transactions are executed sequentially  
B) A schedule that is equivalent to a serial schedule  
C) A schedule where transactions can be interleaved  
D) A schedule that is correct but not efficient  
  
Answer: B) A schedule that is equivalent to a serial schedule  
  
\*\*Level: Understand, Page Source: 783\*\*  
Question: Explain the importance of serializability in transaction processing.  
A) It ensures that all transactions are executed sequentially  
B) It allows for interleaving of operations from different transactions  
C) It ensures that a schedule is correct but not efficient  
D) It allows for concurrency control  
  
Answer: D) It allows for concurrency control  
  
\*\*Level: Apply, Page Source: 791\*\*  
Question: Solve the following problem: Determine which of the schedules in Figure 20.8(b) and (c) are conflict serializable.  
  
(Note: This question requires applying the concept of serializability to determine which schedules are correct)  
  
\*\*Level: Analyze, Page Source: 782\*\*  
Question: Compare the benefits of a serial schedule with those of a serializable schedule.  
A) A serial schedule is more efficient but less correct  
B) A serializable schedule is more correct and more efficient  
C) A serial schedule is always preferred over a serializable schedule  
D) A serializable schedule has no benefits  
  
Answer: B) A serializable schedule is more correct and more efficient  
  
\*\*Level: Evaluate, Page Source: 782\*\*  
Question: Justify the statement that being serializable is distinct from being serial.  
A) Being serializable ensures that transactions are executed sequentially  
B) Being serializable allows for interleaving of operations from different transactions  
C) Being serializable ensures that a schedule is correct but not efficient  
D) Being serializable has no distinction with being serial  
  
Answer: C) Being serializable ensures that a schedule is correct but not efficient  
  
\*\*Level: Create, Page Source: 782\*\*  
Question: Generate a scenario where having multiple equivalent serial schedules would be beneficial in transaction processing.  
  
(Note: This question requires creating a scenario that demonstrates the benefits of having multiple equivalent serial schedules)  
  
Let me know if you need any further assistance!

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

Response: Here are six multiple-choice questions based on the Set concept:  
  
\*\*Question 1 (Remember)\*\*  
What is the additional operation in the Set interface that returns a new object P of type set<T> that is the union of two sets O and S?  
A) create\_intersection(S)  
B) create\_difference(S)  
C) P = O.create\_union(S)  
D) is\_proper\_subset\_of(S)  
  
\*\*Answer:\*\* C) P = O.create\_union(S)  
\*\*LEVEL:\*\* Remember  
\*\*PAGE SOURCE:\*\* 407  
  
\*\*Question 2 (Understand)\*\*  
What type of constructor allows part of an object or literal value to include a collection of other objects or values when needed?  
A) Tuple constructor  
B) Atom constructor  
C) Collection (or multivalued) type constructors  
D) Dictionary(K,T) type constructors  
  
\*\*Answer:\*\* C) Collection (or multivalued) type constructors  
\*\*LEVEL:\*\* Understand  
\*\*PAGE SOURCE:\*\* 382,383  
  
\*\*Question 3 (Apply)\*\*  
What is the return value of the operation O.is\_subset\_of(S) in the Set interface?  
A) True if set object O is a proper subset of some other set object S  
B) False if set object O is not a subset of some other set object S  
C) True if set object O is a subset of some other set object S  
D) The size of the two sets  
  
\*\*Answer:\*\* C) True if set object O is a subset of some other set object S  
\*\*LEVEL:\*\* Apply  
\*\*PAGE SOURCE:\*\* 408  
  
\*\*Question 4 (Analyze)\*\*  
Compare and contrast the operations create\_intersection(S) and create\_difference(S) in the Set interface.  
A) They return the same result, but with different syntax  
B) They are used to find the intersection and difference of two sets, respectively  
C) One returns a new set and the other returns a boolean value  
D) They are not related to set operations  
  
\*\*Answer:\*\* B) They are used to find the intersection and difference of two sets, respectively  
\*\*LEVEL:\*\* Analyze  
\*\*PAGE SOURCE:\*\* 408  
  
\*\*Question 5 (Evaluate)\*\*  
Justify why the Set interface includes the additional operation P = O.create\_union(S).  
A) It allows for more complex set operations  
B) It is only useful for large datasets  
C) It simplifies the process of finding the union of two sets  
D) It is not a necessary operation in the Set interface  
  
\*\*Answer:\*\* C) It simplifies the process of finding the union of two sets  
\*\*LEVEL:\*\* Evaluate  
\*\*PAGE SOURCE:\*\* 408  
  
\*\*Question 6 (Create)\*\*  
Generate a new set type constructor that allows for the creation of sets with duplicate elements.  
A) bag(T)  
B) list(T)  
C) array(T)  
D) dictionary(K,T)  
  
\*\*Answer:\*\* A) bag(T)  
\*\*LEVEL:\*\* Create  
\*\*PAGE SOURCE:\*\* 408

* Question: Create six multiple choice question and answer of the question with the Specifying Privileges - Views concept

Response: Here are six multiple-choice questions based on the context:  
  
\*\*LEVEL: Understand\*\*  
\*\*PAGE SOURCE:\*\* 1144  
  
Q1: What is the purpose of the "References privilege" on a relation R?  
A) To modify certain attributes of R  
B) To reference (or refer to) a relation R when specifying integrity constraints  
C) To create a view V of R that limits access to specific fields  
D) To revoke previously granted privileges  
  
Answer: B) To reference (or refer to) a relation R when specifying integrity constraints

* Question: Create six multiple choice question and answer of the question with the Structured Query Language concept

Response: Here are six multiple-choice questions and answers based on the provided context:  
  
\*\*LEVEL: Remember\*\*  
\*\*PAGE SOURCE: 192\*\*  
  
Question: Define SQL.  
  
A) Simple Query Language  
B) Structured Query Language  
C) Standard Query Language  
D) Syntax Query Language  
  
Answer: B) Structured Query Language  
  
\*\*LEVEL: Understand\*\*  
\*\*PAGE SOURCE: 237\*\*  
  
Question: Explain the role of a DBMS in executing a query in SQL.  
  
A) The user specifies what the result is to be, leaving the actual optimization and decisions on how to execute the query to the DBMS.  
B) The DBMS only executes the query if it is well-formed and meets certain syntax requirements.  
C) The user has complete control over the execution of the query in SQL.  
D) A query in SQL can only consist of up to two clauses, SELECT and FROM.  
  
Answer: A) The user specifies what the result is to be, leaving the actual optimization and decisions on how to execute the query to the DBMS.  
  
\*\*LEVEL: Apply\*\*  
\*\*PAGE SOURCE: 248\*\*  
  
Question: Solve for the mandatory clauses in a SQL retrieval query.  
  
A) SELECT and JOIN  
B) FROM and WHERE  
C) SELECT and FROM  
D) INSERT and DELETE  
  
Answer: C) SELECT and FROM  
  
\*\*LEVEL: Analyze\*\*  
\*\*PAGE SOURCE: 669\*\*  
  
Question: Compare the typical steps when processing a high-level query in SQL with other query languages.  
  
A) Scanning, parsing, validating, immediate form of query, query optimizer, execution plan, query code generator  
B) Query optimization, validation, compilation, runtime database processor, code execution  
C) Parsing, scanning, compiling, runtime database processor, query code generation  
D) Syntax checking, query optimization, execution plan creation, query code generation  
  
Answer: A) Scanning, parsing, validating, immediate form of query, query optimizer, execution plan, query code generator  
  
\*\*LEVEL: Evaluate\*\*  
\*\*PAGE SOURCE: 192\*\*  
  
Question: Justify the use of SQL as a high-level declarative language interface.  
  
A) It allows users to specify what they want without worrying about how it is executed.  
B) It provides a simple and intuitive way to interact with relational databases.  
C) It enables efficient query optimization and execution by the DBMS.  
D) It is compatible with all database management systems.  
  
Answer: A) It allows users to specify what they want without worrying about how it is executed.  
  
\*\*LEVEL: Create\*\*  
\*\*PAGE SOURCE: 669\*\*  
  
Question: Modify the typical steps when processing a high-level query in SQL to include an additional step for error handling.  
  
A) Scanning, parsing, validating, immediate form of query, query optimizer, execution plan, query code generator, error handling  
B) Query optimization, validation, compilation, runtime database processor, code execution, error logging  
C) Parsing, scanning, compiling, runtime database processor, query code generation, exception handling  
D) Syntax checking, query optimization, execution plan creation, query code generation, error reporting  
  
Answer: A) Scanning, parsing, validating, immediate form of query, query optimizer, execution plan, query code generator, error handling

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

Response: Here are six multiple-choice questions based on the context:  
  
\*\*Question 1: LEVEL - Remember; PAGE SOURCE - 352\*\*  
What is embedded SQL?  
A) A technique for embedding SQL statements in a host language  
B) A type of database management system  
C) A programming language specifically designed for databases  
D) A method for querying multiple tables at once  
  
Answer: A) A technique for embedding SQL statements in a host language

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

Response: Here are six multiple-choice questions based on the given text about subclass concepts:  
  
\*\*Level 1: Remember\*\*  
\*\*Page Source:\*\* 131 (Page 132)  
  
Q: What is a subclass in the context of database systems?  
  
A) A superclass that has no subclasses  
B) A class that inherits attributes from its direct superclass  
C) A class that belongs to more than one superclass  
D) A class that has no attributes  
  
Answer: B) A class that inherits attributes from its direct superclass  
  
\*\*Level 2: Understand\*\*  
\*\*Page Source:\*\* 131 (Page 132)  
  
Q: What is the relationship between a subclass and its superclass in database systems?  
  
A) The subclass has more attributes than its superclass  
B) The subclass inherits attributes from its direct superclass  
C) The subclass has no relationship with its superclass  
D) The subclass is identical to its superclass  
  
Answer: B) The subclass inherits attributes from its direct superclass  
  
\*\*Level 3: Apply\*\*  
\*\*Page Source:\*\* 132 (Page 133)  
  
Q: Consider the following hierarchy: EMPLOYEE -> STUDENT\_ASSISTANT. What can an entity in STUDENT\_ASSISTANT inherit?  
  
A) Only the attributes of its direct superclass, EMPLOYEE  
B) All the attributes of EMPLOYEE and STUDENT  
C) The attributes of all superclasses up to the root of the hierarchy  
D) No attributes from its superclass  
  
Answer: C) The attributes of all superclasses up to the root of the hierarchy  
  
\*\*Level 4: Analyze\*\*  
\*\*Page Source:\*\* 132 (Page 133)  
  
Q: Compare and contrast single inheritance and multiple inheritance in database systems.  
  
A) Single inheritance is when a subclass inherits attributes from only one superclass, while multiple inheritance is when a subclass inherits attributes from more than one superclass  
B) Single inheritance is when a subclass has no relationships with its superclasses, while multiple inheritance is when a subclass has relationships with multiple superclasses  
C) Single inheritance is when a subclass belongs to more than one superclass, while multiple inheritance is when a subclass has no relationships with its superclasses  
D) Single inheritance is when a subclass inherits attributes from all its superclasses, while multiple inheritance is when a subclass does not inherit any attributes  
  
Answer: A) Single inheritance is when a subclass inherits attributes from only one superclass, while multiple inheritance is when a subclass inherits attributes from more than one superclass  
  
\*\*Level 5: Evaluate\*\*  
\*\*Page Source:\*\* 132 (Page 133)  
  
Q: Justify why the existence of at least one shared subclass leads to a lattice in database systems.  
  
A) Because a shared subclass has more attributes than its superclasses  
B) Because a shared subclass inherits attributes from multiple superclasses  
C) Because a shared subclass is identical to its superclass  
D) Because a shared subclass has no relationships with its superclasses  
  
Answer: B) Because a shared subclass inherits attributes from multiple superclasses  
  
\*\*Level 6: Create\*\*  
\*\*Page Source:\*\* None (Generated question)  
  
Q: Develop a new example of a hierarchy or lattice in database systems, including at least one shared subclass.  
  
(Note: This question requires the creation of a new example and is not based on specific text in the document.)

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

Response: Here are six multiple-choice questions based on the Subset concept:  
  
\*\*LEVEL 3, PAGE 83\*\*  
  
\*\*Question:\*\* What is the power set P(V) of a set V?  
  
A) The set of all subsets of V  
B) The set of all elements in V  
C) The set of all unions of V  
D) The set of all intersections of V  
  
\*\*Answer:\*\* A) The set of all subsets of V

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

Response: Here are six multiple-choice questions and answers based on the provided text:  
  
\*\*LEVEL 1: Remember\*\*  
Q: What is a superclass in the context of object-oriented modeling?  
A) A subclass that inherits attributes from another subclass.  
B) A class that has no subclasses.  
C) A class that is inherited by one or more subclasses.  
D) A category (union type).  
  
Answer: C) A class that is inherited by one or more subclasses.  
  
LEVEL: Remember  
PAGE SOURCE: 131  
  
\*\*LEVEL 2: Understand\*\*  
Q: What happens when an entity in a hierarchy inherits attributes from multiple superclasses?  
A) The attributes are included only once.  
B) The attributes are duplicated.  
C) The attributes are discarded.  
D) The attributes are combined.  
  
Answer: A) The attributes are included only once.  
  
LEVEL: Understand  
PAGE SOURCE: 131  
  
\*\*LEVEL 3: Apply\*\*  
Q: What is the term for a subclass that inherits attributes from multiple superclasses?  
A) Single inheritance  
B) Multiple inheritance  
C) Shared subclass  
D) Leaf node  
  
Answer: B) Multiple inheritance  
  
LEVEL: Apply  
PAGE SOURCE: 131  
  
\*\*LEVEL 4: Analyze\*\*  
Q: Compare and contrast single inheritance with multiple inheritance.  
A) Single inheritance is more common, while multiple inheritance is less common.  
B) Single inheritance allows for simpler models, while multiple inheritance requires more complex models.  
C) Single inheritance inherits attributes only once, while multiple inheritance may duplicate attributes.  
D) Single inheritance is limited to leaf nodes, while multiple inheritance allows for shared subclasses.  
  
Answer: C) Single inheritance inherits attributes only once, while multiple inheritance may duplicate attributes.  
  
LEVEL: Analyze  
PAGE SOURCE: 131  
  
\*\*LEVEL 5: Evaluate\*\*  
Q: Justify the importance of considering the concept of multiple inheritance in object-oriented modeling.  
A) It is essential to avoid duplication of attributes.  
B) It allows for more complex models and relationships.  
C) It simplifies attribute inheritance.  
D) It only applies to shared subclasses.  
  
Answer: B) It allows for more complex models and relationships.  
  
LEVEL: Evaluate  
PAGE SOURCE: 131  
  
\*\*LEVEL 6: Create\*\*  
Q: Develop a scenario where multiple inheritance is necessary in an object-oriented model.  
A) A student who is both a research assistant and a teaching assistant needs to inherit attributes from both EMPLOYEE and STUDENT.  
B) An engineer who manages projects and teaches courses needs to inherit attributes from both PERSON and ALUMNUS.  
C) A department chair who oversees multiple departments needs to inherit attributes from both MANAGER and PROFESSOR.  
D) A database administrator who works on multiple systems needs to inherit attributes from both PERSON and SYSTEM.  
  
Answer: A) A student who is both a research assistant and a teaching assistant needs to inherit attributes from both EMPLOYEE and STUDENT.  
  
LEVEL: Create  
PAGE SOURCE: 131

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

Response: Here are six multiple-choice questions and answers based on the Superkey concept:  
  
\*\*Q1. Level: Remember\*\*  
What is a superkey in relational databases?  
  
A) A set of attributes that uniquely identifies each tuple in a relation  
B) A minimal set of attributes that ensures uniqueness for all tuples  
C) A set of attributes that can be used to identify uniquely each tuple  
D) A constraint that specifies a uniqueness property  
  
Answer: C) A set of attributes that can be used to identify uniquely each tuple  
  
LEVEL: Remember, PAGE SOURCE: 172  
  
\*\*Q2. Level: Understand\*\*  
What is the difference between a key and a superkey in relational databases?  
  
A) A key is a subset of a superkey  
B) A superkey is a subset of a key  
C) A key has no redundancy, while a superkey can have redundant attributes  
D) A key is optional, while a superkey is required  
  
Answer: C) A key has no redundancy, while a superkey can have redundant attributes  
  
LEVEL: Understand, PAGE SOURCE: 172  
  
\*\*Q3. Level: Apply\*\*  
Identify whether the attribute set {Ssn} in the STUDENT relation is a:  
  
A) Key  
B) Superkey  
C) Both (Key and Superkey)  
D) Neither  
  
Answer: A) Key  
  
LEVEL: Apply, PAGE SOURCE: 173  
  
\*\*Q4. Level: Analyze\*\*  
Compare the properties of a key and a superkey in relational databases.  
  
A) Both have uniqueness property, but keys are minimal while superkeys are not  
B) Both have redundancy, while keys are optional and superkeys are required  
C) Keys have no redundancy, while superkeys can have redundant attributes  
D) Superkeys always require all its attributes together to have uniqueness property  
  
Answer: C) Keys have no redundancy, while superkeys can have redundant attributes  
  
LEVEL: Analyze, PAGE SOURCE: 172-173  
  
\*\*Q5. Level: Evaluate\*\*  
Justify why the {Ssn, Name, Age} attribute set in the STUDENT relation is a superkey but not a key.  
  
A) Because it has redundant attributes  
B) Because it requires all its attributes together to have uniqueness property  
C) Because removing any attribute from the set still leaves us with a superkey  
D) Because it is not minimal  
  
Answer: C) Because removing any attribute from the set still leaves us with a superkey  
  
LEVEL: Evaluate, PAGE SOURCE: 173  
  
\*\*Q6. Level: Create\*\*  
Develop an example of a relation schema that has multiple keys and explain why they are considered keys.  
  
A) STUDENT relation with {Ssn, Name} as key  
B) CUSTOMER relation with {CustomerID, Email} as key  
C) ORDER relation with {OrderID, Date} as key  
D) All the above  
  
Answer: D) All the above  
  
LEVEL: Create, PAGE SOURCE: Not applicable

* Question: Create six multiple choice question and answer of the question with the The Dirty Read Problem concept

Response: Here are six multiple-choice questions based on the "The Dirty Read Problem" concept:  
  
\*\*LEVEL 1: Remember\*\*  
\*\*PAGE SOURCE:\*\* 1077  
  
Question: What is known as the value of item X that is read by transaction T2 in the context of the dirty read problem?  
  
A) Clean data  
B) Dirty data  
C) Temporary data  
D) Original data  
  
Answer: B) Dirty data  
  
\*\*LEVEL 2: Understand\*\*  
\*\*PAGE SOURCE:\*\* 1077  
  
Question: What happens if transaction T1 updates item X and then fails before completion, leading to a dirty read problem?  
  
A) The system rolls back the update and returns to the original value  
B) Transaction T2 reads the temporary value of X, which is not recorded permanently in the database  
C) The update is committed and the new value is recorded permanently  
D) The transaction fails and no changes are made  
  
Answer: B) Transaction T2 reads the temporary value of X, which is not recorded permanently in the database  
  
\*\*LEVEL 3: Apply\*\*  
\*\*PAGE SOURCE:\*\* 1077  
  
Question: A database system experiences a dirty read problem. How can it ensure that transaction T1's updates are properly rolled back?  
  
A) By committing the update and then rolling back  
B) By reading the temporary value of X before committing the update  
C) By using a separate log to record the update and then rolling back  
D) By ignoring the update and starting over  
  
Answer: C) By using a separate log to record the update and then rolling back  
  
\*\*LEVEL 4: Analyze\*\*  
\*\*PAGE SOURCE:\*\* 1077  
  
Question: Compare and contrast dirty reads with other types of anomalies that can occur in database systems.  
  
A) Dirty reads are the most common type of anomaly, while others are rare  
B) Dirty reads are a type of non-recoverable error, while others are recoverable  
C) Dirty reads are caused by transaction failures, while others are caused by hardware issues  
D) Dirty reads can be prevented with proper locking mechanisms, while others require more complex solutions  
  
Answer: B) Dirty reads are a type of non-recoverable error, while others are recoverable  
  
\*\*LEVEL 5: Evaluate\*\*  
\*\*PAGE SOURCE:\*\* 1077  
  
Question: Justify the importance of handling dirty read problems in database systems.  
  
A) It is not important because it only affects occasional transactions  
B) It is important because it can lead to incorrect data being recorded and affect multiple transactions  
C) It is important because it can cause system crashes, but most databases are designed to handle this problem  
D) It is important because it can be prevented with simple locking mechanisms  
  
Answer: B) It is important because it can lead to incorrect data being recorded and affect multiple transactions  
  
\*\*LEVEL 6: Create\*\*  
\*\*PAGE SOURCE:\*\* None (created question)  
  
Question: Generate a scenario where a dirty read problem occurs in an online banking system. How would the bank handle this situation?  
  
A) By rolling back the transaction and returning the account to its original state  
B) By committing the transaction and allowing the account balance to be updated incorrectly  
C) By ignoring the update and letting the customer re-attempt the transaction  
D) By calling the customer's attention to the issue and asking them to confirm the changes  
  
Answer: A) By rolling back the transaction and returning the account to its original state

* Question: Create six multiple choice question and answer of the question with the The Lost Update Problem concept

Response: Here are the six multiple-choice questions and answers based on the "The Lost Update Problem" concept:  
  
\*\*Level: Remember\*\*  
\*\*Page Source:\*\* 763, Page Label: 764  
\*\*Question:\*\* What is the type of problem that occurs when two transactions access the same database items concurrently?  
A) The Deadlock Problem  
B) The Lost Update Problem  
C) The Inconsistent Read Problem  
D) The Phantoms Problem  
  
\*\*Answer:\*\* B) The Lost Update Problem  
  
\*\*Level: Understand\*\*  
\*\*Page Source:\*\* 763, Page Label: 764  
\*\*Question:\*\* Describe the scenario where the Lost Update Problem occurs.  
A) When two transactions access different database items concurrently.  
B) When one transaction accesses a single database item while another transaction is waiting to commit.  
C) When two transactions access the same database items and their operations are interleaved incorrectly.  
D) When a transaction is aborted and resubmitted after an update.  
  
\*\*Answer:\*\* C) When two transactions access the same database items and their operations are interleaved incorrectly.  
  
\*\*Level: Apply\*\*  
\*\*Page Source:\*\* 763, Page Label: 764  
\*\*Question:\*\* Suppose transactions T1 and T2 access the same database item X concurrently. If T2 reads the value of X before T1 updates it, what is the result?  
A) The updated value will be correct.  
B) The final value of X will be incorrect due to the Lost Update Problem.  
C) The transaction with higher priority will win.  
D) The transaction that was submitted later will always lose.  
  
\*\*Answer:\*\* B) The final value of X will be incorrect due to the Lost Update Problem.  
  
\*\*Level: Analyze\*\*  
\*\*Page Source:\*\* 763, Page Label: 764  
\*\*Question:\*\* Compare and contrast the Lost Update Problem with the Inconsistent Read Problem.  
A) They are the same problem with different names.  
B) The Lost Update Problem occurs when two transactions update the same item concurrently, while the Inconsistent Read Problem occurs when a transaction reads inconsistent values from multiple updates.  
C) The Lost Update Problem is caused by incorrect interleaving of operations, while the Inconsistent Read Problem is caused by reading outdated data.  
D) One problem is caused by concurrency and the other by disk failures.  
  
\*\*Answer:\*\* B) The Lost Update Problem occurs when two transactions update the same item concurrently, while the Inconsistent Read Problem occurs when a transaction reads inconsistent values from multiple updates.  
  
\*\*Level: Evaluate\*\*  
\*\*Page Source:\*\* 763, Page Label: 764  
\*\*Question:\*\* Justify why the Lost Update Problem is a significant issue in concurrent transaction processing.  
A) It only affects transactions that update the same item concurrently.  
B) It can lead to incorrect results and inconsistent data, which may cause system failures or errors.  
C) It is only relevant for high-priority transactions.  
D) It does not affect the correctness of the database.  
  
\*\*Answer:\*\* B) It can lead to incorrect results and inconsistent data, which may cause system failures or errors.  
  
\*\*Level: Create\*\*  
\*\*Page Source:\*\* 763, Page Label: 764  
\*\*Question:\*\* Generate a scenario where two transactions (T1 and T2) access different database items (X and Y) concurrently. How would you prevent the Lost Update Problem in this scenario?  
A) By using locks to ensure exclusive access to each item.  
B) By replaying the log from the last checkpoint.  
C) By using timestamps to order the operations correctly.  
D) By aborting one of the transactions if a conflict occurs.  
  
\*\*Answer:\*\* A) By using locks to ensure exclusive access to each item.

* Question: Create six multiple choice question and answer of the question with the The Unrepeatable Read Problem concept

Response: Here are six multiple-choice questions based on the concept of the Unrepeatable Read Problem:  
  
\*\*Level 1: Remember\*\*  
\*\*Page Source:\*\* 752  
\*\*Question:\*\* What is another problem that may occur in transaction processing?  
A) Uncommittable Read  
B) Unrepeatable Read  
C) Deadlock  
D) Rollback  
  
\*\*Answer:\*\* B) Unrepeatable Read  
  
\*\*Level 2: Understand\*\*  
\*\*Page Source:\*\* 752  
\*\*Question:\*\* Why might a customer's airline reservation transaction read the same item twice?  
A) To ensure that the seat availability is correct  
B) To prevent other transactions from reading the same item  
C) Because the system requires two reads to complete the transaction  
D) To allow the customer to change their mind about the flight  
  
\*\*Answer:\*\* A) To ensure that the seat availability is correct  
  
\*\*Level 3: Apply\*\*  
\*\*Page Source:\*\* 752 (not applicable, since this question type requires a specific scenario or problem to be solved)  
  
\*\*Level 4: Analyze\*\*  
\*\*Page Source:\*\* 752  
\*\*Question:\*\* Compare and contrast the Unrepeatable Read Problem with another transaction processing problem.  
A) Deadlock vs. Unrepeatable Read  
B) Rollback vs. Uncommittable Read  
C) Concurrency Control vs. Isolation Level  
D) Locking vs. Unlocking  
  
\*\*Answer:\*\* A) Deadlock vs. Unrepeatable Read (both problems occur when multiple transactions interact with the same data)  
  
\*\*Level 5: Evaluate\*\*  
\*\*Page Source:\*\* 752  
\*\*Question:\*\* Justify why recovery is needed in transaction processing.  
A) To ensure that all operations are completed successfully  
B) To prevent other transactions from reading the same item  
C) To allow the system to restart after a failure  
D) To guarantee that the database remains consistent  
  
\*\*Answer:\*\* A) To ensure that all operations are completed successfully  
  
\*\*Level 6: Create\*\*  
\*\*Page Source:\*\* Not applicable (since this question type requires the creation of new concepts or ideas)  
  
Let me know if you need any further assistance!

* Question: Create six multiple choice question and answer of the question with the Third normal form (3NF) concept

Response: Here are six multiple-choice questions based on the context:  
  
\*\*LEVEL: Remember\*\*  
\*\*PAGE SOURCE: 501\*\*  
  
Q1: What is the definition of Third Normal Form (3NF)?  
A) A relation schema R is in 3NF if every non-key attribute depends solely on the entire primary key.  
B) A relation schema R is in 3NF if it does not have any functional dependencies.  
C) A relation schema R is in 3NF if every non-key attribute depends on a subset of the primary key.  
D) A relation schema R is in 3NF if all its attributes are prime.  
  
Answer: A) A relation schema R is in 3NF if every non-key attribute depends solely on the entire primary key.  
  
\*\*LEVEL: Understand\*\*  
\*\*PAGE SOURCE: 501\*\*  
  
Q2: What type of dependencies can be removed from a relation that violates 3NF?  
A) Transitive and partial dependencies  
B) Functional and multivalued dependencies  
C) Independent and dependent attributes  
D) Prime and non-prime attributes  
  
Answer: A) Transitive and partial dependencies  
  
\*\*LEVEL: Apply\*\*  
\*\*PAGE SOURCE: 511\*\*  
  
Q3: Suppose a relation schema R has two functional dependencies X → A and Y → B. If X is not a superkey, what can be concluded about the relation?  
A) The relation is in 2NF but not in 3NF.  
B) The relation is in 3NF but not in BCNF.  
C) The relation violates both 2NF and 3NF.  
D) The relation does not violate any normal form.  
  
Answer: C) The relation violates both 2NF and 3NF.  
  
\*\*LEVEL: Analyze\*\*  
\*\*PAGE SOURCE: 501\*\*  
  
Q4: Compare the definitions of Boyce-Codd Normal Form (BCNF) and Third Normal Form (3NF). Which one is stricter?  
A) BCNF is stricter than 3NF.  
B) 3NF is stricter than BCNF.  
C) Both forms are equally strict.  
D) Neither form is stricter.  
  
Answer: A) BCNF is stricter than 3NF.  
  
\*\*LEVEL: Evaluate\*\*  
\*\*PAGE SOURCE: 501\*\*  
  
Q5: Justify why a relation that violates 3NF can be decomposed into smaller relations in 3NF.  
A) Because the dependencies are transitive and partial, making it difficult to handle.  
B) Because the functional dependencies are independent and do not affect each other.  
C) Because the relation is inconsistent and cannot be normalized.  
D) Because the non-key attributes depend solely on the entire primary key.  
  
Answer: A) Because the dependencies are transitive and partial, making it difficult to handle.  
  
\*\*LEVEL: Create\*\*  
\*\*PAGE SOURCE: 511\*\*  
  
Q6: Modify the definition of Third Normal Form (3NF) to include an additional condition that ensures a relation does not have any transitive or partial dependencies.  
A) Add a condition that checks for non-prime attributes determining other non-prime attributes.  
B) Add a condition that checks for proper subsets of keys functionally determining non-prime attributes.  
C) Add a condition that checks for multivalued dependencies violating the 3NF definition.  
D) Add a condition that checks for independent functional dependencies not affecting each other.  
  
Answer: A) Add a condition that checks for non-prime attributes determining other non-prime attributes.

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

Response: Here are six multiple-choice questions based on the context:  
  
\*\*LEVEL: 1 (Remember)\*\*  
\*\*PAGE SOURCE:\*\* 759  
\*\*Question:\*\* What is the concept of a transaction in database processing?  
A) A single database command  
B) A logical unit of database processing that must be completed in its entirety to ensure correctness  
C) A way to describe database updates  
D) A type of database query  
  
\*\*Answer:\*\* B) A logical unit of database processing that must be completed in its entirety to ensure correctness  
  
\*\*LEVEL: 2 (Understand)\*\*  
\*\*PAGE SOURCE:\*\* 812  
\*\*Question:\*\* What is the purpose of the validation phase in optimistic concurrency control?  
A) To apply transaction updates to the database  
B) To check if serializability will not be violated if the transaction updates are applied  
C) To restart a failed transaction  
D) To retrieve data items from the transaction workspace  
  
\*\*Answer:\*\* B) To check if serializability will not be violated if the transaction updates are applied  
  
\*\*LEVEL: 3 (Apply)\*\*  
\*\*PAGE SOURCE:\*\* N/A  
\*\*Question:\*\* What is an example of a single transaction that may involve retrieval and update operations?  
A) A bank withdrawal transaction  
B) A credit card processing transaction  
C) An online retail purchase transaction  
D) A stock market trading transaction  
  
\*\*Answer:\*\* A) A bank withdrawal transaction  
  
\*\*LEVEL: 4 (Analyze)\*\*  
\*\*PAGE SOURCE:\*\* 787  
\*\*Question:\*\* What is the main idea behind optimistic concurrency control?  
A) To perform all checks at once to minimize overhead  
B) To apply transaction updates immediately after validation  
C) To restart failed transactions repeatedly  
D) To keep multiple versions of database items  
  
\*\*Answer:\*\* A) To perform all checks at once to minimize overhead  
  
\*\*LEVEL: 5 (Evaluate)\*\*  
\*\*PAGE SOURCE:\*\* 183  
\*\*Question:\*\* What is the primary goal of a transaction in database processing?  
A) To ensure that serializability will not be violated  
B) To leave the database in a valid or consistent state  
C) To perform retrieval operations only  
D) To update the database as quickly as possible  
  
\*\*Answer:\*\* B) To leave the database in a valid or consistent state  
  
\*\*LEVEL: 6 (Create)\*\*  
\*\*PAGE SOURCE:\*\* N/A  
\*\*Question:\*\* Develop an example of a transaction that involves multiple database updates, such as a bank transfer transaction.  
A) Example not provided  
B) A customer transfers money from account A to account B  
C) A company pays employee salaries and bonuses  
D) An online retailer processes multiple orders simultaneously  
  
\*\*Answer:\*\* B) A customer transfers money from account A to account B

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

Response: Here are six multiple-choice questions based on the given context:  
  
\*\*Question 1: Remember\*\*  
LEVEL: 1  
PAGE SOURCE: 1075  
  
What type of question is "Who is the president of the United States?"?  
  
A) Factoid Question  
B) Analytical Question  
C) Hypothetical Question  
D) Open-Ended Question  
  
Answer: A) Factoid Question  
  
\*\*Question 2: Understand\*\*  
LEVEL: 2  
PAGE SOURCE: 471  
  
What is the primary concept involved in question answering systems?  
  
A) Category or type of question  
B) Answering strategies  
C) Hybrid answering strategies  
D) Natural Language Processing  
  
Answer: A) Category or type of question  
  
\*\*Question 3: Apply\*\*  
LEVEL: 3  
PAGE SOURCE: 1089  
  
What property helps to reduce the search space of possible solutions in the Apriori algorithm?  
  
A) Antimonotonicity Property  
B) Downward Closure Property  
C) Upward Closure Property  
D) Mutually Exclusive Property  
  
Answer: A) Antimonotonicity Property  
  
\*\*Question 4: Analyze\*\*  
LEVEL: 4  
PAGE SOURCE: 1088  
  
What is the main difference between the candidate frequent 1-itemsets and the candidate frequent 2-itemsets in the Apriori algorithm?  
  
A) The number of items in each set  
B) The support value for each set  
C) The order in which they are processed  
D) The type of transactions they are derived from  
  
Answer: B) The support value for each set  
  
\*\*Question 5: Evaluate\*\*  
LEVEL: 5  
PAGE SOURCE: 155  
  
What assumption is made about the scope of a UML diagram for storing a played game of chess in a database?  
  
A) The game is played on a 10 × 10 board.  
B) The game is played between three players.  
C) The game is played on an 8 × 8 board.  
D) The game is played with a random number of pieces.  
  
Answer: C) The game is played on an 8 × 8 board.  
  
\*\*Question 6: Create\*\*  
LEVEL: 6  
PAGE SOURCE: N/A  
  
Design a UML diagram for storing a played game of chess in a database. Consider the assumptions made about the scope and create a diagram that includes entities and relationships to represent the game's data.  
  
(Note: This question requires the creation of a UML diagram, which cannot be provided here. The answer would depend on the creativity and problem-solving skills of the individual.)

* Question: Create six multiple choice question and answer of the question with the Trojan Horse attacks concept

Response: Here are six multiple-choice questions based on the provided context:  
  
\*\*LEVEL 1: Remember\*\*  
\*\*PAGE SOURCE:\*\* 1076, \*\*PAGE LABEL:\*\* 1077  
Question: Define a Named entity extractor.  
A) A tool used to generate candidate answers  
B) A method used to parse and align question and passages  
C) A technique used to extract essential information from concepts  
D) A type of answer scoring algorithm  
  
Answer: A) A tool used to generate candidate answers  
  
\*\*LEVEL 2: Understand\*\*  
\*\*PAGE SOURCE:\*\* 1076, \*\*PAGE LABEL:\*\* 1077  
Question: Explain the purpose of surface pattern matching in named entity extraction.  
A) To parse and align question and passages  
B) To extract essential information from concepts  
C) To generate candidate answers by instantiating regular expression templates with arguments from the question  
D) To determine the confidence scores for candidate answers  
  
Answer: C) To generate candidate answers by instantiating regular expression templates with arguments from the question  
  
\*\*LEVEL 3: Apply\*\*  
\*\*PAGE SOURCE:\*\* 1076, \*\*PAGE LABEL:\*\* 1077  
Question: Solve the following problem: Given a question "What is an inert gas?" and a passage "Inert gases are noble gases that do not react with other elements.", apply surface pattern matching to generate candidate answers.  
A) Helium, Neon, Argon, Krypton  
B) Oxygen, Nitrogen, Carbon Dioxide, Hydrogen  
C) Mercury, Lead, Tin, Copper  
D) None of the above  
  
Answer: A) Helium, Neon, Argon, Krypton  
  
\*\*LEVEL 4: Analyze\*\*  
\*\*PAGE SOURCE:\*\* 1076, \*\*PAGE LABEL:\*\* 1077  
Question: Compare and contrast surface pattern matching with structural matching in named entity extraction.  
A) Surface pattern matching is used for parsing and alignment, while structural matching is used for generating candidate answers  
B) Surface pattern matching is used for generating candidate answers, while structural matching is used for parsing and alignment  
C) Both surface pattern matching and structural matching are used for parsing and alignment  
D) Neither surface pattern matching nor structural matching is used in named entity extraction  
  
Answer: B) Surface pattern matching is used for generating candidate answers, while structural matching is used for parsing and alignment  
  
\*\*LEVEL 5: Evaluate\*\*  
\*\*PAGE SOURCE:\*\* 1076, \*\*PAGE LABEL:\*\* 1077  
Question: Justify the use of joint initiatives in research and academia to create baselines for QA techniques.  
A) To improve the accuracy of answer scoring  
B) To facilitate the adoption of common metrics and methodologies  
C) To reduce the complexity of QA architectures  
D) None of the above  
  
Answer: B) To facilitate the adoption of common metrics and methodologies  
  
\*\*LEVEL 6: Create\*\*  
\*\*PAGE SOURCE:\*\* 1076, \*\*PAGE LABEL:\*\* 1077  
Question: Generate a new type of question that can be answered using named entity extraction techniques.  
A) "What is the capital of France?"  
B) "Who is the CEO of Google?"  
C) "What is the meaning of 'named entity' in QA?"  
D) None of the above  
  
Answer: A) "What is the capital of France?"

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

Response: Here are six multiple-choice questions based on the given context:  
  
\*\*Level: Remember\*\*  
\*\*Page Source: 225\*\*  
  
Q1: What does EXISTS(Q) return in a nested query?  
A) TRUE if there is no tuple in the result of the nested query  
B) TRUE if at least one tuple exists in the result of the nested query  
C) FALSE if there is no tuple in the result of the nested query  
D) FALSE if at least one tuple exists in the result of the nested query  
  
Answer: B) TRUE if at least one tuple exists in the result of the nested query  
  
\*\*Level: Remember\*\*  
\*\*Page Source: 225\*\*  
  
Q2: What type of query is EXISTS typically used with?  
A) Uncorrelated  
B) Correlated  
C) Subquery  
D) Join  
  
Answer: B) Correlated  
  
\*\*Level: Understand\*\*  
\*\*Page Source: 226-227\*\*  
  
Q3: How does the nested query in Query 16B relate to the EMPLOYEE tuple?  
A) It retrieves all DEPENDENT tuples with the same Essn, Sex, and Dependent\_name as the EMPLOYEE tuple  
B) It retrieves only DEPENDENT tuples that do not match the EMPLOYEE tuple's attributes  
C) It does not affect the EMPLOYEE tuple at all  
D) It returns a single tuple matching the EMPLOYEE tuple  
  
Answer: A) It retrieves all DEPENDENT tuples with the same Essn, Sex, and Dependent\_name as the EMPLOYEE tuple  
  
\*\*Level: Apply\*\*  
\*\*Page Source: 231\*\*  
  
Q4: What aggregate function can be used to count the number of dependents for each employee?  
A) SUM  
B) COUNT  
C) SOME  
D) ALL  
  
Answer: B) COUNT  
  
\*\*Level: Analyze\*\*  
\*\*Page Source: 227-228\*\*  
  
Q5: How does Query 16B differ from a regular selection condition involving nested queries?  
A) It uses an aggregate function  
B) It uses a correlated nested query  
C) It does not use a nested query at all  
D) It uses a subquery  
  
Answer: B) It uses a correlated nested query  
  
\*\*Level: Evaluate\*\*  
\*\*Page Source: 228\*\*  
  
Q6: What is the purpose of the UNIQUE(Q) function in SQL?  
A) To count the number of tuples in the result of a query  
B) To test whether the result of a query is a set or multiset  
C) To rename columns in a table  
D) To join two tables  
  
Answer: B) To test whether the result of a query is a set or multiset

* Question: Create six multiple choice question and answer of the question with the Two-Phase Locking (2PL) Protocol concept

Response: Here are six multiple-choice questions based on the Two-Phase Locking (2PL) Protocol concept:  
  
\*\*LEVEL 1 - Remember\*\*  
\*\*PAGE SOURCE\*\*: 802, Fundamentals of Database Systems Seventh Edition  
  
Question: What is the primary purpose of the Two-Phase Locking (2PL) protocol?  
A) To ensure serializability in all schedules  
B) To improve concurrency control in a database system  
C) To prevent deadlocks from occurring  
D) To reduce the number of locks held by transactions  
  
Answer: A) To ensure serializability in all schedules

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

Response: Here are six multiple-choice questions based on the Union concept:  
  
\*\*LEVEL 3, PAGE SOURCE: 700\*\*  
  
1. Explain how union operations work in database systems.  
A) By combining tuples from two relations that have some common attributes  
B) By comparing tuples from two relations and removing duplicates  
C) By partitioning the grouping attribute and computing aggregate functions locally  
D) By redistributing unmatched criteria using an identical hash function  
  
Answer: A) By combining tuples from two relations that have some common attributes  
  
\*\*LEVEL 4, PAGE SOURCE: 700\*\*  
  
2. What is the purpose of the OUTER UNION operation in database systems?  
A) To take the union of tuples from two relations that are partially compatible  
B) To compare tuples from two relations and remove duplicates  
C) To partition the grouping attribute and compute aggregate functions locally  
D) To redistribute unmatched criteria using an identical hash function  
  
Answer: A) To take the union of tuples from two relations that are partially compatible  
  
\*\*LEVEL 2, PAGE SOURCE: 700\*\*  
  
3. Define Union operation in database systems.  
A) An operation that combines tuples from two relations based on a common attribute  
B) An operation that removes duplicates from a set of tuples  
C) An operation that compares tuples from two relations and returns matching values  
D) An operation that distributes unmatched criteria using an identical hash function  
  
Answer: A) An operation that combines tuples from two relations based on a common attribute  
  
\*\*LEVEL 5, PAGE SOURCE: 700\*\*  
  
4. Justify the use of Union operations in database systems.  
A) To simplify data retrieval and reduce query complexity  
B) To eliminate duplicates from a set of tuples  
C) To compare tuples from two relations and return matching values  
D) To distribute unmatched criteria using an identical hash function  
  
Answer: A) To simplify data retrieval and reduce query complexity  
  
\*\*LEVEL 1, PAGE SOURCE: 700\*\*  
  
5. Define the term Union in database systems.  
A) The combination of tuples from two relations based on a common attribute  
B) The removal of duplicates from a set of tuples  
C) The comparison of tuples from two relations and returning matching values  
D) The distribution of unmatched criteria using an identical hash function  
  
Answer: A) The combination of tuples from two relations based on a common attribute  
  
\*\*LEVEL 6, PAGE SOURCE: None\*\*  
  
6. Generate a SQL query that uses the Union operation to combine data from two tables.  
A) SELECT \* FROM table1 UNION SELECT \* FROM table2  
B) SELECT \* FROM table1 INTERSECT SELECT \* FROM table2  
C) SELECT \* FROM table1 EXCEPT SELECT \* FROM table2  
D) SELECT \* FROM table1 JOIN table2 ON common\_attribute = common\_attribute  
  
Answer: A) SELECT \* FROM table1 UNION SELECT \* FROM table2

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

Response: Here are six multiple-choice questions based on the Weak Entity Type concept:  
  
\*\*LEVEL: Understand\*\*  
\*\*PAGE SOURCE: Page 93\*\*  
  
1. What is a weak entity type in an ER diagram?  
A) An entity type that has its own key attribute  
B) An entity type that does not have its own key attribute and relies on another entity type for identification  
C) A relationship type between two entities  
D) A constraint that specifies the minimum and maximum participation of an entity in a relationship  
  
Answer: B) An entity type that does not have its own key attribute and relies on another entity type for identification  
  
\*\*LEVEL: Apply\*\*  
\*\*PAGE SOURCE: Page 92\*\*  
  
2. Which of the following is NOT a characteristic of weak entity types?  
A) They do not have their own key attributes  
B) They are identified by being related to specific entities from another entity type  
C) They always have total participation constraint with respect to their identifying relationship  
D) They can participate independently in multiple relationships  
  
Answer: D) They can participate independently in multiple relationships (according to the text, weak entity types may participate independently in other relationship types)  
  
\*\*LEVEL: Analyze\*\*  
\*\*PAGE SOURCE: Page 93\*\*  
  
3. What is the purpose of the partial key attribute in a weak entity type?  
A) To identify the weak entity type itself  
B) To identify the owner entity type  
C) To specify the minimum and maximum participation constraint with respect to the identifying relationship  
D) To differentiate between different instances of the same weak entity type  
  
Answer: D) To differentiate between different instances of the same weak entity type (the partial key attribute is used to distinguish between different instances of a weak entity type)  
  
\*\*LEVEL: Evaluate\*\*  
\*\*PAGE SOURCE: Page 93\*\*  
  
4. What is the identifying relationship of a weak entity type?  
A) A relationship that relates the weak entity type to its own key attributes  
B) A relationship that relates the weak entity type to another entity type in combination with one of its attribute values  
C) A relationship that specifies the minimum and maximum participation constraint with respect to the identifying relationship  
D) A relationship that does not exist for weak entity types  
  
Answer: B) A relationship that relates the weak entity type to another entity type in combination with one of its attribute values  
  
\*\*LEVEL: Create\*\*  
\*\*PAGE SOURCE: Page 93\*\*  
  
5. Design a simple ER schema diagram for a UNIVERSITY database, including at least two strong entity types and one weak entity type.  
  
(Note: This is an open-ended question that requires the creation of a new ER diagram)  
  
\*\*LEVEL: Remember\*\*  
\*\*PAGE SOURCE: Page 93\*\*  
  
6. What is another name for the identifying entity type or owner entity type in a weak entity type?  
A) Parent entity type  
B) Dominant entity type  
C) Child entity type  
D) Subordinate entity type  
  
Answer: A) Parent entity type (according to the text, the identifying entity type is also called the parent entity type)