Review Test Submission: Review Questions 5

User	Jiawei Wu
Course	MET CS 779 O1 Advanced Database Management (2022 Spring 1)
Test	Review Questions 5
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Time Elapsed	31 minutes
Results Displayed	All Answers, Submitted Answers, Correct Answers, Feedback, Incorrectly Answered Questions

Question 1

8 out of 8 points

Select all that are true about MongoDB.

Selected Answers:
- MongoDB maintains some aspects of relational DBMSes, such as cursors and indexes.
- It would be possible to put all your data into a single MongoDB document.

Answers:
- MongoDB maintains some aspects of relational DBMSes, such as cursors and indexes.
- MongoDB documents are completely unstructured.
- It would be possible to put all your data into a single MongoDB document.

Answer Feedback: This is true. MongoDB implements “result sets” which operate in the same way as a SQL cursor. MongoDB also supports the use of indexes and references.

Answer Feedback: This is true. A MongoDB document can have multi-valued elements and documents in the same collection can have different data elements with different data types, so in theory, this would be possible.

Question 2

8 out of 8 points

1. The reasons that ACIDS requrements do not scale well include:

Selected Answers:
ACIDS requirements include a property that ensures that all parts of a transaction are executed. This takes more time as the tables get larger and consistency must be maintained for the entire transaction.

ACIDS requirements include a property that ensures that all transactions are executed in the proper order. Maintaining that order becomes more complicated as the tables get larger.

Answers:
ACIDS requirements include a property that ensures that all parts of a transaction are executed. This takes more time as the tables get larger and consistency must be maintained for the entire transaction.

ACIDS requirements include a property that ensures that users have permission to process the transaction. As the transaction scales, this involves more access checking.

ACIDS requirements include a property that ensures that all transactions are executed in the proper order. Maintaining that order becomes more complicated as the tables get larger.

Answer Feedback: This is true. When the parts of the transaction take more time to complete, the entire transaction takes more time to complete. The atomic property assures the user that all parts will complete before the next transaction executes on that data.

Answer Feedback: This is true. The property of Serializability ensures that all transactions are executed in order, without any intervening transactions. As the tables grow larger, maintaining the sequence of updates is dependent on consistency, and this becomes more time-consuming.

Question 3

5.33333 out of 8 points

Select all that are true about Big Data.

Selected Answers:
Big Data is largely comprised of structured and semi-structured data.

Big Data databases often have no predetermined schema.

Answers:
Big Data is largely comprised of structured and semi-structured data.

Big Data databases are as reliable and accurate as relational databases.

Big Data databases often have no predetermined schema.

The hardware base for most Big Data databases is expected to fail regularly.

Answer Feedback: This is true. Normally Big Data data models provide the means to analyze this kind of data more efficiently than relational databases.

Answer Feedback: This is true. Many Big Data data models allow the structure of the data to change as data is loaded.

Question 4

8 out of 8 points

Select all that are true of Hadoop.

Selected Answers:
- Hadoop works with the MapReduce paradigm, which uses key/value pairs.
- Hadoop separates the data from the metadata in a publisher/subscriber architecture where the publisher stores the metadata and the subscribers store the data.

Answers:
- Hadoop works with the MapReduce paradigm, which uses key/value pairs.
- Hadoop uses full replication which it copies the data to different DataNodes.
- Hadoop separates the data from the metadata in a publisher/subscriber architecture where the publisher stores the metadata and the subscribers store the data.

Answer Feedback: This is true. Hadoop uses the mappers, aggregators and reducers that operate on key/value pairs.

Answer Feedback: This is true. The data is stored on the subscriber machines, called DataNodes, and the metadata is stored on the publisher machine, called the NameNode.

Question 5

8 out of 8 points

Select all that are true of Neo4j.

Selected Answers:
- Neo4j has its own query language that is used to execute CRUD operations of Neo4j graphs.
- Relationships in a Neo4j graph can also include properties.
- student: Boston University is an example of the properties of a graph node.

Answers:
- Neo4j has its own query language that is used to execute CRUD operations of Neo4j graphs.
- Relationships in a Neo4j graph can also include properties.
- student: Boston University is an example of the properties of a graph node.

Answer Feedback: This is true. Neo4j uses the language Cypher as illustrated in the module.

Answer Feedback: This is true. Both nodes and relationships can include properties.

Answer Feedback: This is true. Properties are key-value pairs. In this example, student is the key, and Boston University is the value.

Question 6

2.8 out of 8 points

Which of the following are correct descriptions of the differences between big data databases and relational databases? (Check all that apply.)

Selected Answers:
- ✓ Big data databases do not require that data conform to a predefined schema, which is required of relational databases.
- ✗ Big data databases can scale vertically to sizes that are not attainable by relational databases.

Answers:
- ✓ Big data databases do not require that data conform to a predefined schema, which is required of relational databases.
- Big data databases can scale vertically to sizes that are not attainable by relational databases.
- It is easier to work with Big Data data solutions than with traditional relational Database Management Systems.
- ✓ Big data database solutions are available from traditional RDBMS vendors.

Answer Feedback: Big data databases store data in key-value and other formats with flexible schemas. This improves flexibility but sacrifices integrity enforcement.

Answer Feedback: Big Data databases can scale horizontally by seamlessly adding new machines and redistributing the data.

Question 7

8 out of 8 points

Select all that are true of consistency types.

Selected Answers:
- ✓ Read-your-writes consistency will provide a single user with a consistent view of the data.
- ✓ Weak consistency may result in updates occurring in the wrong order.
- Eventual consistency may result in incorrect data for some users.
- ✓

Answers:
- ✓ Read-your-writes consistency will provide a single user with a consistent view of the data.
- ✓ Weak consistency may result in updates occurring in the wrong order.
- Eventual consistency may result in incorrect data for some users.
- ✓

Answer

Feedback: This is true. With Read-Your-Writes consistency, a user will see a consistent view of his own updates, although they may not have propagated to all replicas.

Answer Feedback: This is true. With weak consistency, there is no guarantee that updates will occur in the proper order.

Answer Feedback: This is true. Eventual consistency means that some copies will update immediately, but it will take time before the updates propagate to all copies. Because one of the features of Big Data data models is high-performance, these models use eventual consistency so they can proceed with the next transactions while the data is being replicated.

Question 8

8 out of 8 points

Select all that are true of graph databases.

Selected Answers:
- Many graph database products use both relational DBMSes and a graph database model.
- Graph databases are better than RDBMSes at modeling recursive relationships.
- Graph databases illustrate relationships between different vertices or nodes.

Answers:
- Many graph database products use both relational DBMSes and a graph database model.
- Graph databases are better than RDBMSes at modeling recursive relationships.
- Graph databases illustrate relationships between different vertices or nodes.

Answer Feedback: This is true. Graph databases are better with some kinds of queries that involve traversing links, and exhibit poorer performance with other kinds of queries that don't involve traversals. A relational database backend can improve performance in those cases.

Answer Feedback: This is true. Modeling recursive and intricate relationships is one of the strengths of graph databases.

Answer Feedback: This is true. The links between nodes in a graph database represent the relationships.

Question 9

8 out of 8 points

Select all that are true of Dynamo DB.

Selected Answers:
- A Dynamo DB table requires a primary key.
- Each attributes in a DynamoDB table is a key-value pair.

A DynamoDB table can include rows with different collections of attributes.

Answers:
- A Dynamo DB table requires a primary key.
- Each attributes in a DynamoDB table is a key-value pair.
- A DynamoDB table can include rows with different collections of attributes.

Answer Feedback: This is true. The primary key can consist of one attribute or a composite key on several attributes, which acts as a range index.

Answer Feedback: This is true.

Answer Feedback: This is true. A DynamoDB table can include rows that themselves include different attributes and multi-valued attributes.

Question 10

6.8 out of 8 points

Some of the scalability limitations of relational databases include: (Select all that apply.)

Selected Answers:
- Relational databases with large logical tables often make use of row partitioning, using global indexes that don't scale well
- Relational databases use joins to associate data, which can be expensive. Big Data data models do not have an equivalent feature.
- Relational database transactions conform to ACIDS requirements which prevent them from being scalable

Answers:
- Relational databases with large logical tables often make use of row partitioning, using global indexes that don't scale well
- Relational databases use joins to associate data, which can be expensive. Big Data data models do not have an equivalent feature.
- Relational database transactions conform to ACIDS requirements which prevent them from being scalable

Answer Feedback: This is true. Row partitioning helps with large data tables, but require global indexes, which do not scale well.

Answer Feedback: This is false. Big Data data models often have join-like techniques. MongoDB, for instance, uses refs, which can be used to manually create a join.

Answer Feedback: This is true. Many of the properties of ACIDS requirements can hinder performance.

Question 11

6.8 out of 8 points

Select all that are true about MongoDB relationships.

Selected Answers:
- One way to model a one-to-many relationship in a MongoDB document is to include all the data in the same document.
- Using references to link two MongoDB documents is as efficient as an RDBMS join.
- MongoDB permits one-to-one and one-to-many relationships between documents.

Answers:
- One way to model a one-to-many relationship in a MongoDB document is to include all the data in the same document.
- Using references to link two MongoDB documents is as efficient as an RDBMS join.
- MongoDB permits one-to-one and one-to-many relationships between documents.

Answer Feedback: This is true. MongoDB allows multiple values for fields inside a document, so including all the data together is one way to model this kind of relationship.

Answer Feedback: This is false. While using references links the two documents or collections, a second query is necessary in MongoDB to extract the data. An RDBMS join returns all the requested data, without the need for a second query.

Answer Feedback: This is true. MongoDB does not permit joins as such, but there are techniques to mimic one-to-one and one-to-many relationships.

Question 12

6.8 out of 8 points

Which of the following are true of semi-structured data? (Check all that are true.)

Selected Answers:
- Semi-structured data could include city and state in one tuple, and just city in another
- Semi-structured data can be used with object-oriented DBMSs.
- The structure of semi-structured data can change rapidly.
- Semi-structured data is usually represented in a BLOB data type.

Answers:
- Semi-structured data could include city and state in one tuple, and just city in another
- Semi-structured data can be used with object-oriented DBMSs.
- The structure of semi-structured data can change rapidly.

Question 13

2 out of 2 points

Eager replication is more consistent with ACIDS requirements.

Selected Answer: True

Answers: True
False

Response Feedback: This is true. Eager replication ensures that all copies of the data are updated in the same transaction.

Question 14

2 out of 2 points

Row-store structure is the basic structure of RDBMS tables.

Selected Answer: True

Answers: True
False

Response Feedback: This is true. A row-store structure stores data by rows, which is the way an RDBMS table is created and maintained.

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← OK