SQL (pt2)

1. What are the different set operations in SQL? Which set operations support duplicates?
   1. > UNION, INTERSECT, UNION ALL are good to know. UNION combines two resultsets removing duplicates, INTERSECT produces results that appear in both of two result sets, and UNION ALL combines two resultsets including duplicates.
2. What is the difference between joins and set operations?
   1. Joins are used to combine columns from different tables while set operations are used to combine rows
3. How can I create an alias in SQL?
   1. Keyword AS
4. What does the AS keyword do in a query?
   1. Creates an alias
5. What is a transaction?
   1. A single unit of work (a single statement)
6. What are the properties of a transaction?
   1. ACID (Atomicity, Consistency, Isolation, Durability)
7. What are the transaction isolation levels and what do they prevent?
   1. Transaction Isolation Levels are a measure of the extent to which transaction isolation succeeds. Levels are defined as the presence or absence of these:
      1. Dirty Reads
      2. Nonrepeatable Reads
      3. Phantoms
   2. The levels are :
      1. Read uncommitted
      2. Read committed
      3. Repeatable read
      4. Serializable
8. What are dirty reads, non repeatable reads, and phantom reads?
9. What is normalization?
   1. The process of organizing the columns and tables of a database to ensure dependencies are properly enforced by database integrity constraints
      1. 1NF
         1. Each table cell should contain a single value
         2. Each record is unique
      2. 2NF
         1. Be in 1NF
         2. Single column primary key that does not functionally depend on any subset of candidate key relation
      3. 3NF
         1. Be in 2NF
         2. Have no transitive functional dependencies
10. What are the requirements for different levels of normalization?
    1. ^^^
11. What is a view?
    1. A view is like a virtual table that contains data from one or more tables. It does not physically exist in the database
12. What is a dao?
    1. Data access object
13. What is the danger of putting values directly into our queries?
    1. Makes database prone to injection
14. What is multiplicity? Examples of 1-to-1, 1-to-N, N-to-N?
    1. specifies the cardinality or number of instances of an EntityType that can be associated with the instances of another EntityType
15. What is an Index?
    1. A quick lookup table that is used for finding records quickly in a database
16. What advantages does creating an Index give us? Disadvantages?
    1. Allows for quicker searching
    2. Decreases performance on inserts updates and deletes
17. What is CRUD?
    1. Create, Read, Update, Delete. The most basic operations that can be performed in SQL
18. What does it mean that an operation or transaction on a data store is atomic?
    1. It means that the entire transaction happens, or it doesn’t happen at all
19. What does ACID stand for?
    1. Atomicity – All or nothing when it comes to completion of a transaction
    2. Consistency – Guarantees that a transaction never leaves your database in a half-finished state
    3. Isolation – Keeps transactions separated until they are finished (one transaction can’t interact with another)
    4. Durability – Database will keep track of pending changed in such a way that the server can recover from an abnormal termination

MongoDB

1. What does BASE stand for?
   1. Basic Availability, Soft-state, Eventual consistency
2. What is a database in Mongo?
   1. A database in Mongo is a grouping of unstructured data in JSON format
3. What is a collection?
   1. Equates to a table
4. What is a document?
   1. Equates to a row
5. What rules does Mongo enforce about the structure of documents inside a collection?
6. What is a distributed application? A distributed data store?
7. What is High Availability? How is it achieved in Mongo?
   1. High availability is the ability of a system to operate continuously without failing for a designated period of time. Mongo achieves it through replica sets
8. What is Scalability? How is it achieved in Mongo?
   1. Scalability is the ability of a database to grow in size. It is achieved both vertically and horizontally in MongoDB. Horizontally through sharding and replica sets
9. Explain replica sets and sharding
10. What are NoSQL databases? What are the different types of NoSQL databases?
    1. NoSQL is a type of nonrelational database query language.
    2. Wide column, document, key-value, graph
11. What kind of NoSQL database MongoDB is?
    1. It is a document database
12. Which are the most important features of MongoDB?
    1. Can handle unstructured data
13. What is a Namespace in MongoDB?
    1. The name of the collection, including the database.
14. Compare SQL databases and MongoDB at a high level.
    1. SQL databases are structured while MongoDB is used to save unstructured data
15. How is MongoDB better than other SQL databases?
    1. It is much faster than other SQL databases
    2. Much more scalable
    3. More flexible
16. Does MongoDB support foreign key constraints?
    1. No
17. Does MongoDB support ACID transaction management and locking functionalities?
    1. YES, but not innately
18. How can you achieve primary key - foreign key relationships in MongoDB?
    1. By embedding a document inside another
19. When should we embed one document within another in MongoDB?
    1. When we want to relate the two documents
20. Mention what is Objecld composed of?
    * 1. 4-byte timestamp value representing object’s creation
      2. 5-byte random value
      3. 3-byte incrementing counter