Brandon Girard Assignment SQL Evaluation Prep

1. What is index; types of indices; pros and cons.

An Index allows the sql server to find data without having to scan entire tables, the downsides are additional space usage and slower insert, update, and delete operations. There are 2 types of indexes:

clustered - one per table and it sorts the rows.

Non clusetered: can have more than one per table and does not sort the rows.

2. What's the difference between Primary key and Unique constraint?

-A table can have only one primary key, but multiple unique keys.

-A table can have at most one null unique key, but no null primary key.

-Primary key will sort the data by default, a unique key will not.

3. Tell me about check constraint

Limits the value range that can be placed on a column

4. Difference between temp table and table variable

Temp tables are physically stored in the temp db, while table variables exist in a batch.

5. Difference between WHERE and HAVING

Having is used to apply conditions to aggregate columns, while where is used to apply conditions to non aggregate columns.

6. Difference between RANK() and DenseRank() — value gap

Rank will skip ranking values according to how many were ranked the same, while DenseRank will continue to rank every subsequent value chronologically.

7. COUNT(\*) vs. COUNT(colName)

Count(\*) returns the number of rows in a table, while count(colName) returns the number of non null values in the column.

8. What's the difference between left join and inner join? JOIN and Subquery, which one has a

better performance, why?

Inner join will only return values in tables that satisfy the ON condition, while left join returns all values in the left table and only those values in the right table that satisfy the ON condition. Join is more performant than subquery because joins will reduce the burden on the db by replacing multiple queries into one.

9. What is correlated subquery

Subquery where the inner query is dependant on the outer query

10. What is a CTE, why do we need CTE?

Common table expression is a temporary named result set that can be referenced within a select, insert, update, or delete statement. They can also be used with recursion to create complex queries.

11. What does SQL Profiler do?

Creates, manages, analyzes, and replays trace results

12. What is SQL injection, how to avoid SQL injection?

Type of injection attack that allows malicious queries to be executed on the sql server. It can be avoided by using prepared statements

13. Difference between SP and user defined function? When to use SP when to use function?

-An SP is called by executing its name, while a function is called from a query.

-An SP does not require an output, while a function must return some value.

-An SP can call a function, but not vice versa.

-An SP is used when dealing with DML situations, while functions are used for calculations.

14. Criteria of Union and Union all? Difference between UNION and UNION ALL

The criteria are:

-The number of columns in both selects must be the same.

-The column types in both selects must be the same.

-If a column alias is to be used, it must be given in the first select statement.

A union will return non repeating values from both tables, while union all will return duplicates.

15. Steps you take to improve SQL Queries

-Look at the execution plan

-choose indexes wisely

-avoid unnecessary joins

-avoid select \*

-replace subqueries with joins

-use derived tables to avoid grouping by

16. concurrency problem in transaction

Concurrency occurs when two or more transactions attempt to access the same data or info

17. what is deadlock, how to prevent

A deadlock is when 2 processes are competing for exclusive access to a resource, but are unable because the other process is preventing it. Can be prevented by setting isolation level read committed.

18. what is normalization, 1NF - BCNF, benefits using normalization

Normalization is the process to eliminate data redundancy and enhance data integrity in the table.

1NF - atomocity: a single cell cannot hold multiple values.

2NF - table should not contain partial dependency.

3NF - should have no transitive dependency for non-prime attributes

BCNF - for any dependency A -> B, A should be a super key

19. what are the system defined databases?

Master, model, msdb, tempdb

20. composite key

Combination of columns used to identify involved rows uniquely

21. candidate key

Single or group of keys that uniquely identify rows in a table.

22. DDL vs. DML

DDL consists of create, drop, alter, and truncate. DML consists of insert, update, delete.

23. ACID property

Atomicity - work is atomic

Consistency - whatever happens in the middle of the transaction, this property will never leave db half completed

Isolation - two transactions will be isolated from each other by locking the resource

Durability - once the transaction is completed, the changes it made to the db will be permanent

24. table scan vs. index scan

Table scan iterates over all table rows, while an index scan iterates over all index items.

25. Difference between Union and JOIN

Join combines the contents of tables based on a condition, union does the same irrespective of any condition.