

DBMS Interview Questions

Curated by: Vaidhyanathan S M

1. What are ACID properties in DBMS?

Atomicity - The entire transaction takes place at once or doesn't happen at all (abort or commit).

Consistency - The Database must be consistent before and after the transaction.

Isolation - Multiple transactions occur independently without interference.

Durability - The changes of a successful transaction occurs even if the system failure occurs.

2. When do you use Having and Where clauses?

“**Where**” clause can't be used with aggregate functions but the “**Having**” clause can.

For example: SELECT student, SUM(score) as total from marks
GROUP BY student HAVING total > 70

3. What are different keys in RDBMS?

Candidate key - The minimal set of attributes which can uniquely identify a tuple is known as candidate key. It can be a composite key as well. For example - (student_no, course_no)

Primary key - Out of all the candidate keys, only one can be chosen as the primary key.

Super key - The set of attributes which can uniquely identify a tuple is known as super key.

- Adding 0 or more attributes to the candidate key generates a super key.
- A candidate key is a super key but not vice-versa.

Alternate key - The candidate key other than the primary key is called an alternate key.

Foreign key - It is a column or a combination of columns whose values match a primary key in a different table.

4. What are the different Normal Forms in RDBMS?

First Normal Form: A relation is in first normal form if it does not contain any multi-valued or composite attribute.

Second Normal Form: A relation is in second normal form if it does not contain any partial dependency. A dependency is called partial dependency if any proper subset of candidate key determines non-prime (which are not part of candidate key) attribute.

Third Normal Form: A relation is in third normal form if it does not contain any transitive dependency. For a relation to be in Third Normal Form, either LHS of FD (Functional Dependency) should be super key or RHS should be prime attribute.

Boyce-Codd Normal Form: A relation is in Boyce-Codd Normal Form if LHS of every FD is super key.

5. What is embedded and dynamic SQL?

Static or Embedded SQL

- SQL statements in an application that do not change at runtime and, therefore, can be hard-coded into the application.

Dynamic SQL

- SQL statements that are constructed at runtime; for example, the application may allow users to enter their own queries.
- Dynamic SQL is a programming technique that enables you to build SQL statements dynamically at runtime. You can create more general purpose, flexible applications by using dynamic SQL because the full text of a SQL statement may be unknown at compilation.

6. What is the difference between char and varchar?

- CHAR column length is fixed while VARCHAR length is variable.
- The maximum no. of character CHAR data type can hold is 255 character while VARCHAR can hold up to 4000 character.
- CHAR is 50% faster than VARCHAR.

7. What are the advantages of DBMS over traditional file based systems?

Database management systems were developed to handle the following difficulties of typical File-processing systems.

- Data redundancy and inconsistency
- Data isolation
- Integrity problems
- Concurrent access by multiple users
- Security problems

8. What is database normalization?

It is the process of analysing the given relational schemas based on their functional dependencies and primary keys to achieve the following desirable properties:

- Minimizing redundancy
- Minimizing Insertion, Updation and Deletion anomalies.

9. Explain the categories of SQL commands.

- DDL - It stands for Data Definition Language. Commands under this category are CREATE, ALTER, DROP and RENAME.
- DML - It stands for Data Manipulation Language. Commands under this category are INSERT and UPDATE.
- DQL - It stands for Data Query Language. Command under this category is SELECT.
- DCL - It stands for Data Control Language. Commands under this category are GRANT and REVOKE.
- TCL - It stands for Transaction Control Language. Commands under this category are COMMIT and ROLLBACK.

10. What is a view in SQL?

A view is a virtual table based on the result-set of an SQL statement. We can create using the create view syntax.

```
CREATE VIEW view_name AS SELECT column_name(s) FROM  
table_name WHERE condition
```

11. What is a Trigger?

A Trigger is a code that is associated with insert, update or delete operations. The code is executed automatically whenever the associated query is executed on a table. Triggers can be useful to maintain integrity in databases.

12. What is a stored procedure?

A stored procedure is like a function that contains a set of operations compiled together. It contains a set of operations that are commonly used in an application to do some common database tasks.

13. What is a transaction in a database?

A Database Transaction is a set of database operations that must be treated as whole, meaning either all operations are executed or none of them.

An example can be a bank transaction from one account to another account. Either both debit and credit operations must be executed or none of them.

14. What are indexes?

A database index is a data structure that improves the speed of data retrieval operations on a database table at the cost of additional writes and the use of more storage space to maintain the extra copy of data.

NOTE: Solve Questions from HackerRank on SQL and also refer to Geeks for Geeks for more questions.