Commonly asked DBMS interview questions | Set 1

What are advantages of DBMS over traditional file based systems?

2.4

Ans: Database management systems were developed to handle the following difficulties of typical file-processing systems supported by conventional operating systems.

1. Data redundancy and inconsistency
2. Difficulty in accessing data
3. Data isolation – multiple files and formats
4. Integrity problems
5. Atomicity of updates
6. Concurrent access by multiple users
7. Security problems

Source: http://cs.nyu.edu/courses/spring01/G22.2433-001/mod1.2.pdf

What are super, primary, candidate and foreign keys?

Ans: A superkey is a set of attributes of a relation schema upon which all attributes of the schema are functionally dependent. No two rows can have the same value of super key attributes.

A Candidate key is minimal superkey, i.e., no proper subset of Candidate key attributes can be a superkey.

A Primary Key is one of the candidate keys. One of the candidate keys is selected as most important and becomes the primary key. There cannot be more that one primary keys in a table.

Foreign key is a field (or collection of fields) in one table that uniquely identifies a row of another table. See this for an example.

What is the difference between primary key and unique constraints?

Ans: Primary key cannot have NULL value, the unique constraints can have NULL values. There is only one primary key in a table, but there can be multiple unique constrains.

What is database normalization?

Ans: It is a process of analyzing the given relation schemas based on their functional dependencies and primary keys to achieve the following desirable properties:

1) Minimizing Redundancy

2) Minimizing the Insertion, Deletion, And Update Anomalies

Relation schemas that do not meet the properties are decomposed into smaller relation schemas that could meet desirable properties.

Source: http://cs.tsu.edu/ghemri/CS346/ClassNotes/Normalization.pdf

What is SQL?

SQL is Structured Query Language designed for inserting and modifying in a relational database system.

What are the differences between DDL, DML and DCL in SQL?

Ans: Following are some details of three.

DDL stands for Data Definition Language. SQL queries like CREATE, ALTER, DROP and RENAME come under this.

DML stands for Data Manipulation Language. SQL queries like SELECT, INSERT and UPDATE come under this.

DCL stands for Data Control Language. SQL queries like GRANT and REVOKE come under this.

What is the difference between having and where clause?

Ans: HAVING is used to specify a condition for a group or an aggregate function used in select statement. The WHERE clause selects before grouping. The HAVING clause selects rows after grouping. Unlike HAVING clause, the WHERE clause cannot contain aggregate functions. (See this for examples).

See Having vs Where Clause? for more details

How to print duplicate rows in a table?

Ans: See http://quiz.geeksforgeeks.org/how-to-print-duplicate-rows-in-a-table/

What is Join?

Ans: An SQL Join is used to combine data from two or more tables, based on a common field between them. For example, consider the following two tables.

Student Table

ENROLLNO	*STUDENTNAME*	*ADDRESS*
1000	geek1	geeksquiz1
1001	geek2	geeksquiz2
1002	geek3	geeksquiz3

StudentCourse Table

COURSEID	*ENROLLNO*
1	1000
2	1000
3	1000
1	1002
2	1003

Following is join query that shows names of students enrolled in different courseIDs.

```
SELECT StudentCourse.CourseID, Student.StudentName
       FROM StudentCourse
       INNER JOIN Customers
       ON StudentCourse.EnrollNo = Student.EnrollNo
       ORDER BY StudentCourse.CourseID;
```

The above query would produce following result.

COURSEID	*STUDENTNAME*
1	geek1
1	geek2

2	geek1
2	geek3
3	geek1

What is Identity?

Ans: Identity (or AutoNumber) is a column that automatically generates numeric values. A start and increment value can be set, but most DBA leave these at 1. A GUID column also generates numbers; the value of this cannot be controlled. Identity/GUID columns do not need to be indexed.

What is a view in SQL? How to create one

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

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

What are the uses of view?

1. Views can represent a subset of the data contained in a table; consequently, a view can limit the degree of exposure of the underlying tables to the outer world: a given user may have permission to query the view, while denied access to the rest of the base table.

2. Views can join and simplify multiple tables into a single virtual table

3. Views can act as aggregated tables, where the database engine aggregates data (sum, average etc.) and presents the calculated results as part of the data

4. Views can hide the complexity of data; for example a view could appear as Sales2000 or Sales2001, transparently partitioning the actual underlying table

5. Views take very little space to store; the database contains only the definition of a view, not a copy of all the data which it presentsv.

6. Depending on the SQL engine used, views can provide extra security

Source: Wiki Page

What is a Trigger?

Ans: A Trigger is a code that 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 database.

What is a stored procedure?

Ans: 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.

What is the difference between Trigger and Stored Procedure?

Ans: Unlike Stored Procedures, Triggers cannot be called directly. They can only be associated with queries.

What is a transaction? What are ACID properties?

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

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

ACID (Atomicity, Consistency, Isolation, Durability) is a set of properties that guarantee that database transactions are processed reliably.

What are indexes?

Ans: 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.

Data can be stored only in one order on disk. To support faster access according to different values, faster search like binary search for different values is desired, For this purpose, indexes are created on tables. These indexes need extra space on disk, but they allow faster search according to different frequently searched values.

What are clustered and non-clustered Indexes?

Ans: Clustered indexes is the index according to which data is physically stored on disk. Therefore, only one clustered index can be created on a given database table.
Non-clustered indexes don't define physical ordering of data, but logical ordering. Typically, a tree is created whose leaf point to disk records. B-Tree or B+ tree are used for this purpos

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