

CS6302 DBMS 2MARK & 16 MARK

UNIT II

SQL & QUERY OPTIMIZATION

1. Define Aggregate Functions in SQL?

Aggregate functions are functions that take a collection of values as input and return a single value. SQL offers five built-in aggregate functions:

- ☐ Average: avg
- ☐ Minimums: min
- ☐ Maximum : max
- ☐ Total: sum
- ☐ Count: count

2. Define Nested Subqueries.

SQL provides a mechanism for the nesting of sub queries. A sub query is a select-from-where expression that is nested within another query. A common use of sub queries is to perform tests for set membership, set comparison, and set cardinality.

3. Define Integrity constraints.

Integrity constraints provide a means of ensuring that changes made to the database by authorized user do not result in a loss of data consistency. Thus Integrity constraints guard against accidental damage to the database. The constraints are in the following forms: Key declaration and form of a relationship.

4. Define referential Integrity.

Often, we wish to ensure that a value that appears in one relation for a given set of attributes also appears for a certain set of attributes in another relation. This condition is called referential integrity.

5. Define Assertions.

An assertion is a predicate expressing a condition that we wish the database always satisfied. E.g. create assertion <assertion-name> check <predicate>

6. Define Triggers.

A trigger is a statement that is executed automatically by the system as a side effect of a modification to the database. To design a trigger mechanism, we must meet two requirements:

1. Specify the conditions under which the trigger is to be executed.
2. Specify the actions to be taken when the trigger is executed.

7. Define Functional Dependency and fully functional Dependency?

8. List the pitfalls in Relational Database Design.

1. Repletion of information
2. Inability to represent certain information.

9. Define normalization?

It is a process of analyzing the given relation schemas based on their functional Dependencies (FDs) and primary key to achieve the properties.

- ☐ Minimizing redundancy

□ Minimizing insertion, deletion and update anomalies.

10. List the properties of decomposition.

1. Lossless join
2. Dependency preservation
3. No repletion of information

11. Define 1NF?

A relation schema R is in 1NF if the domains of all attributes of R are atomic

12. Define 2 NF?

A relation schema R is in 2NF if every non prime attribute A in R is fully functionally dependent on the primary key of R.

13. Define 3NF?

A relation schema R is in third normal form if, whenever a nontrivial functional dependency $X \rightarrow A$ holds in R, either (a) X is super key of R or (b) A is a prime attribute of R.

14. What is BCNF?

A relation schema R is in BCNF if it is in 3NF and satisfies additional constraints that for every FE $X \rightarrow A$, X must be a candidate key.

15. What is query?

A query with respect to DBMS relates to user commands that are used to interact with a database. The query language can be classified into data definition language and data manipulation language.

16. What do you mean by Correlated subquery?

Subqueries, or nested queries, are used to bring back a set of rows to be used by the parent query. Depending on how the subquery is written, it can be executed once for the parent query or it can be executed once for each row returned by the parent query. If the subquery is executed for each row of the parent, this is called correlated subquery.

17. Define SQL and state the difference between SQL and other conventional programming Language.

SQL is a nonprocedural language that is designed specifically for data access operations on normalized relational database structures. The primary difference between SQL and other conventional programming languages is that SQL statements specify what data operations should be performed rather than how to perform them.

18. What is database trigger is a PL/SQL block that can defined to automatically execute for insert, update and deleted statements against a table .The trigger can be defied to execute once for the entire statement or once for every row that is inserted,updated,or deleted. For any one table, there are twelve events for which you can define database triggers.

19. What are Armstrong rules?

Reflexive rule:

If Y is subset or equal to X the $X \rightarrow Y$

Augmentation rule:

If $X \rightarrow Y$ then $XZ \rightarrow YZ$.

Transitive Rule:

If $\{X \rightarrow Y, Y \rightarrow Z\}$ then $X \rightarrow Z$

The above three are known as Armstrong Rule

20. What are the privileges that can be granted on a table by a user to others?

Insert, Update, delete, select, references, index, execute, alter, all

21. What is the difference between TRUNCATE and DELETE command?

TRUNCATE is a DDL command whereas DELETE is a DML command.

Hence DELETE operation can be rolled back, but TRUNCATE operation cannot be rolled back. WHERE clause can be used with DELETE and not with TRUNCATE.

22. What is the use of CASCADE CONSTRAINTS?

When this clause is used with the DROP command, a parent table can be dropped even when a child table exists.

23. Is it possible for several attributes to have the same domain? Illustrate your answer with suitable examples.

Possibility for several attributes to have same domain. Yes, several attributes to have same domain. For example Attributes: name, address, belong to same domains contains all text string of certain length.

24. List out the field level constraints that can be associated with relational table.

Unique, Check, Not null, primary key, foreign key

25. Justify the need for normalization.

Need for normalization-To avoid insertion, deletion and updating anomalies. To ensure that there is no redundant data. To ascertain that the database design is perfect.

26. Name the different type of joins supported in SQL.

Equi join, Natural join, self join, and outer join.

16/10/8 Marks Questions

1. What is a view? How can it be created? Explain with an example.
2. Discuss in detail the operators SELECT, PROJECT, UNION with suitable examples.
3. Explain static and dynamic SQL in detail.
4. Diagrammatically illustrate and discuss the steps involved in processing a query.
5. Give briefly about Query evaluations cost & Selection operation
6. How does a DBMS represent a relational query evaluation plan?
7. Since indices speed query processing, why might they not be kept on several search keys?

List as many reasons as possible.

8. Consider the database given by the following schemes.

Customer (Cust_No, Sales_Person_No, City)

Sales_Person (Sales_Person_No, Sales_Person_Name,

Common_Prec, Year_of_Hire)

Give an expression in SQL for each of the following queries:

Display the list of all customers by Cust_No with the city in which each is located.

Select Cust No, city from Customer

List the names of the sales persons who have accounts in Delhi.

Select Sales_Person_Name from Sales_Person_Name where (select * from customer where city = delhi)

9. Write short notes on the following:

Data Manipulation Language (DML), Data Definition Language (DDL)

Transaction Control Statements (TCS), Data Control Language (DCL)

10. Consider the employee database, where the primary keys are Underlined.

employee(empname, street, city)

works(empname, companyname, salary)

company(companyname, city)

manages(empname, management)

Give an expression in the relational algebra for each request.

- 1) Find the names of all employees who work for First Bank Corporation.
- 2) Find the names, street addresses and cities of residence of all employees who work for First Bank Corporation and earn more than 200000 per annum.

- 3) Find the names of all employees in this database who live in the same city as the company for which they work.
- 4) Find the names of all employees who earn more than every employees of small Bank Corpor