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A transaction is a single logical unit of work which accesses and possibly modifies the contents of a database. Transactions access data using read and write operations.

In order to maintain consistency in a database, before and after the transaction, certain properties are followed. These are called **ACID** properties.

**Atomicity:**

**Atomicity is also known as the ‘All or nothing rule’.**

\* Each transaction is considered as one unit and either runs to completion or is not executed at all.

**Consistency:**

This means that integrity constraints must be maintained so that the database is consistent before and after the transaction. It refers to the correctness of a database. Referring to the example above,

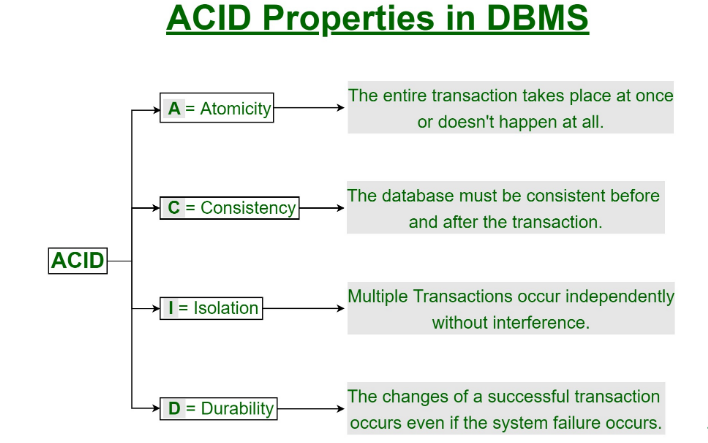
The total amount before and after the **transaction must be maintained the same.**

**Isolation:**

This property ensures that multiple transactions can occur concurrently without leading to the inconsistency of database state. Transactions occur **independently** without interference. Changes occurring in a particular transaction will not be visible to any other transaction until that particular change in that transaction is written to memory or has been committed. This property ensures that the execution of transactions concurrently will result in a state that is equivalent to a state achieved these were executed serially in some order.

**Durability:**

This property ensures that once the transaction has completed execution, the updates and modifications to the database are stored in and written to disk and they persist even if a system failure occurs. These updates now become **permanent and are stored in non-volatile** memory. The effects of the transaction, thus, are never lost.

**views:**

**Important interview question**

1.What is the difference between SQL and MySQL or SQL Server?

2.What is the difference between SQL and PL/SQL?

3.What are various DDL commands in SQL? Give brief description of their purposes.

4.What are various DML commands in SQL? Give brief description of their purposes.

5.What are various DCL commands in SQL? Give brief description of their purposes.

6.Can you sort a column using a column alias?

7.Is a NULL value same as zero or a blank space? If not then what is the difference?

8. How can you eliminate duplicate rows from a query result?

9.What is the purpose of the condition operators BETWEEN and IN?

10.How do you search for a value in a database table when you don’t have the exact value to search for?

11.What is the default ordering of data using the ORDER BY clause? How could it be changed?

12.What are the specific uses of SQL functions?

13.Which function returns the remainder in a division operation?

14.What is the purpose of the NVL function?

15.What is the difference between the NVL and the NVL2 functions?

16.You want to display a result query from joining two tables with 20 and 10 rows respectively. Erroneously you forget to write the WHERE clause. What would be the result?

17.What is the difference between cross joins and natural joins?

18.What is the purpose of the group functions in SQL? Give some examples of group functions.

19.By default the group functions consider only distinct values in the set.

20.The DISTINCT keyword allows a function to consider only non-duplicate values.

21.A single row subquery returns only one row from the outer SELECT statement

22.Multiple column subqueries return more than one column from the inner SELECT statement.

23.What is a view? Why should you use a view?

24.Which SQL statement is used to add, modify or drop columns in a database table?

25.A DROP TABLE statement can be rolled back.

26.What is the difference between VARCHAR2 AND CHAR datatypes?

27.A DDL statement or a DCL statement is automatically committed.

26.What happens if you omit the WHERE clause in a delete statement?

27.The DELETE statement is used to delete a table from the database.

28.While inserting new rows in a table you must list values in the default order of the columns.

29.Which statement is used to add a new row in a database table?

30.What is the purpose of DML statements in SQL?

31.What are the various multiple row comparison operators in SQL?

32.By default the group functions consider only distinct values in the set.

33.All group functions ignore null values.

34.COUNT(\*) returns the number of columns in a table.

https://forms.gle/11ne1kKbDfDfB5oRA

# QUESTIONS PL/SQL

**1. What is a View? (PL/SQL)**

A view is a virtual table which consists of a subset of data contained in a table.

Views are not virtually present, and it takes less space to store.

View can have data of one or more tables combined, and it is depending on the relationship.

How to create views?

Create view view\_name as

(

Sql stat

);

Types of views

1.Simple views.

CREATE VIEW EMP\_VIEW AS

(

SELECT \* FROM EMP)

2.complex views.

CREATE VIEW EMP\_DEPT AS

(

SELECT ENAME,DNAME

FROM EMP INNER JOIN DEPT

ON EMP.DEPTNO=DEPT.DEPTNO)

3.read only view.

CREATE VIEW EMP\_READ AS

SELECT \*

FROM EMP

WITH READ ONLY

(The read only view given an error if any changes could be done for the table)

4.force view.

CREATE FORCE VIEW DEMO\_VIEW

AS

SELECT \* FROM0 DEMO;

Warning: View created with compilation errors.

This can be created even the table is not created .

**What is an Index?(PL/SQL)**

An index is performance tuning method of allowing faster retrieval of records from the table. An index creates an entry for each value and it will be faster to retrieve data.

**What are all the different types of indexes?(PL/SQL)**

**The types of index are follow:**

**1.unique and non unique**

**2.simple and composite .**

**3.functional index**

**4.clustered index (btree).**

**5.non clustered index (bitmap).**

SQL> SELECT \* FROM STUD1;

STUDId SNAME SCONC SSTRM

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S01 SUNDRA 8632087848 CSE

S02 MACHA 899251652 ME

S03 MACHI 965623262 ENTC

S04 SUNDRI 922622922 BT

SELECT \* FROM USER\_INDEXES WHERE TABLE\_NAME ='STUD1';

This query gives an output of the created index in the table.

**Syntax:**

**Create index index\_name on table\_name (coln)**

1.default index/ clustered index:-

SQL> CREATE INDEX IDX1 ON STUD1 (STUDID);

CREATE INDEX IDX2 ON STUD1 (STUDID)

\*

ERROR at line 1:

ORA-01408: such column list already indexed

The error shows that we can create a index on primary key of a table as by database

particularly index is added.

2.simple index:

CREATE INDEX IDX2 ON STUD1 (SSTRM);

3.Btree index:

SQL> CREATE INDEX BTREE ON STUD1 (SCONC);

Index created.

This can be created only for high distinct column .

Cardinality ratio =no of distinct values /total no of rows

4/4 =1

So the cardinality is 1. (btree index)

4.bitmap index:

CREATE INDEX BITMAP ON STUD1 (SNAME);

Index created.

This can be created for less distinct column /less cardinality column.

5.functional index:

Creat index idx2 on emp lower(same);

Index created.

This is index can be uses functions.

**What is a trigger?(PL/SQL)**

A DB trigger is a code or programs that automatically execute with response to some event on a table or view in a database.

Mainly, trigger helps to maintain the integrity of the database.

Example: When a new student is added to the student database, new records should be created in the related tables like Exam, Score and Attendance tables.

**What is the difference between Cluster and Non-Cluster Index? (PL/SQL)**

Clustered index is used for easy retrieval of data from the database by altering the way that the records are stored. Database sorts out rows by the column which is set to be clustered index.

A non clustered index does not alter the way it was stored but creates a complete separate object within the table. It point back to the original table rows after searching.

### What Is SQL Injection?

SQL injection (SQLi) is a type of cyberattack against web applications that use SQL databases such as IBM Db2, Oracle, MySQL, and MariaDB. As the name suggests, the attack involves the injection of malicious SQL statements to interfere with the queries sent by a web application to its database.

Here is how a web application normally works. A user first enters their login credentials into the login form. After these credentials are successfully authenticated, the web application would send an SQL statement in the form of a query to the hosting database to bring forward the user’s data stored in that database. From this user’s perspective, they would now be able to access their account information and send further queries to the database for every action and change made within their account.

Now, when a SQL injection vulnerability exists, an unauthorized threat actor could somehow skip the authentication process and manually inject SQL statements to send fraudulent queries to the database. This would allow the attacker to view, modify, and delete data from the database.

SQL injection is not only highly common, but also very dangerous as it can lead to unauthorized access to personal data, financial information, intellectual property, and trade secrets. It has been listed as the number one risk on the OWASP top 10 list of web application security threats. A large number of data breaches were the result of SQL injection attacks.

### How Does a SQL Injection Attack Work?

A SQL injection attack targets vulnerabilities in dynamic SQL statements. Think of a dynamic SQL statement like a multivariate function in mathematics, of which the parameters are fixed, while the values substituted in the independent variables determine the result.

Similarly, a dynamic SQL statement also consists of a predetermined set of parameters (such as a web form), of which the complete statement is only generated when a user fills in their inputs. See the following example of a SQL statement of a login form:

**SELECT \* FROM users WHERE username = ‘$username’ AND password = bcrypt (‘$password’)**

After the user enters their username and password, the statement would be completed, after which a query would be sent to the server to retrieve the user’s information from the database.

When a vulnerability exists in a dynamic SQL statement, the attacker would be able to enter complex scripts into the forms to interfere with the preexisting parameters to alter the meaning of the complete statement.

How to Prevent a SQL Injection Attack?

Technically, the only way to prevent a SQL injection attack is to have input validation in place. This means that inputs entered by the users must be monitored and sanitized to filter out any potential malicious codes.

This is exactly what a web application firewall (WAF) does. It analyzes all inputs entered by the users into the web application to find any matches with suspicious codes.

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1. What is DBMS?

1. What is RDBMS?

1. What is SQL?

SQL stands for Structured Query Language , and it is used to communicate with the RelDatabase. This is a standard language used to perform tasks such as retrieval, updating, insertion and deletion of data from a database.

1. What is a Database?

Example: School Management Database, Bank Management Database.

1. What are tables and Fields?

1. What is a primary key?

1. What is a unique key?

1. What is a foreign key?

1. What is a join?

1. What are the types of join and explain each?

1. What is normalization?

Normalization is the process of minimizing redundancy and dependency by organizing fields and table of a database.

The main aim of Normalization is to add, delete or modify field that can be made in a single table.

1. What are all the different normalizations?

1. What is a relationship and what are they?(CARDINALITY RATIOS)

Database Relationship is defined as the connection between the tables in a database. There are various data basing relationships, and they are as follows:.

One to One Relationship.

One to Many Relationships.

Many to One Relationship.

Self-Referencing Relationship.

1. What is a query?

A DB query is a code written in order to get the information back from the database.

Query can be designed in such a way that it matches our expectation of the result set. Simply, a question to the Database.

15. What is a subquery?

A subquery is a query within another query.

The outer query is called the main query, and the inner query is called the subquery.

SubQuery is always executed first, and the result of the subquery is passed on to the main query.

16. What are the types of subquery?

17.Difference between WHERE and HAVING clauses.

18.Difference between SRF and MRF .

1. What is the difference between DELETE and TRUNCATE commands?

The DELETE command is used to remove rows from the table, and the WHERE clause can be used for a conditional set of parameters.

Commit and Rollback can be performed after the delete statement.

TRUNCATE removes all rows from the table. Truncate operation cannot be rolled back.

1. What is a constraint?

Constraint can be used to specify the limit on the data type of table.

Constraint can be specified while creating or altering the table statement. Sample constraints are.

NOT NULL.

CHECK.

UNIQUE.

PRIMARY KEY.

FOREIGN KEY.

1. What is data Integrity?

Data Integrity defines the accuracy and consistency of data stored in a database.

It can also define integrity constraints to enforce business rules on the data when it is entered into the application or database.

1. What is Data Warehouse?

Datawarehouse is a central repository of data from multiple sources of information. Those data are consolidated, transformed and made available for the mining and online processing.

Warehouse data has a subset of data called Data Marts.

1. What is Self-Join?

Self-join is set to be a query used to compare to itself.

1. What is Cross-Join?

Cross join is defined as a Cartesian product where the number of rows in the first table multiplied by the number of rows in the second table.

1. What are Union, minus and Interact commands?

UNION operator is used to combine the results of two tables, and it eliminates duplicate rows from the tables.

MINUS operator is used to return rows from the first query but not from the second query. Matching records of first and second query and other rows from the first query will be displayed as a result set.

INTERSECT operator is used to return rows returned by both the queries.

1. What is an ALIAS command?

1. What is the difference between TRUNCATE and DROP statements?

TRUNCATE removes all the rows from the table, and it cannot be rolled back.

DROP command removes a table from the database and operation cannot be rolled back.

1. What are aggregate functions?

Aggregate functions are used to evaluate mathematical calculation and return single values. This can be calculated from the columns in a table.

1. How can you create an empty table from an existing table?

Example will be -.

Select \* into student\_copy from student where 1=2

Here, we are copying the student table to another table with the same structure with no rows copied.

1. How to select unique records from a table?

Select unique records from a table by using DISTINCT keyword.

Select DISTINCT StudentID, StudentName from Student.

1. What is the command used to fetch the first 5 characters of the string?

There are many ways to fetch the first 5 characters of the string -.

Select SUBSTRING(StudentName,1,5) as studentname from student

1. Which operator is used in a query for pattern matching?

LIKE operator is used for pattern matching, and it can be used as -.

% - Matches zero or more characters.

\_ (Underscore) - Matching exactly one character.

33.What are DML statements