

# Assignment - 4

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**Roll no: 25**

- 1.what is user ?Explain types of user.demonstrate how to manage user.
- 2.explain roles and privileges in detail.
- 3.what is index?explain types of index.
- 4.what is transaction management?Explain ACID Properties

## ASSIGNMENT-4

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1. what is user? Explain types of users. demonstrate how to manage user.

→ A user is an individual or entity that interacts with a computer system or database. In the context of database and systems, a user typically refers to someone who accesses and manipulates data through various operations provided by the system. Users may interact with systems for different purposes, such as managing data, querying information, or performing administrative tasks.

→ Types of users:

1. Regular users: These users interact with the systems to perform day-to-day operations. They typically have limited access based on their roles. For example, a regular user in a database might be able to perform SELECT queries but not ALTER table structures.
2. Power Users: These users have more extensive permissions than regular users. They can perform complex queries and operations. For example, a power user might have the ability to create manage views or stored procedures.
3. Administrators: These users have the highest level of access. They can manage

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user accounts, configure the system, and perform maintenance tasks. For example, a regular user in a database might be able to perform SELECT queries but not administrator (DBA) can create or delete databases, manage security, and perform backups.

Example :-

1. Creating users :

```
CREATE USER 'username'@'host' IDENTIFIED BY  
        'Password';
```

2. Granting Permissions :

```
GRANT SELECT, INSERT ON database.table TO  
        'username'@'host';
```

3. Modifying Users :

```
ALTER USER 'username'@'host' IDENTIFIED BY  
        'newpassword';
```

4. Dropping Users :

```
DROP USER 'username'@'host';
```

② Explain roles and privileges in detail.

→ Roles :

Roles are a way to group together a set of privileges that can be assigned to users. Roles help manage permissions efficiently by categorizing them based on job functions or responsibilities.

1. Role Creation :



CREATE ROLE 'role-name';

2. Assigning privileges to roles:

GRANT SELECT, INSERT ON database.table TO  
'role-name';

3. Assigning Roles to users :-

GRANT 'role-name' TO 'username'@'host';

4. Revoking Roles :

REVOKE 'role-name' FROM 'username'@'host';

\* Privileges :

Privileges are permissions that determine what actions a user or role can perform on database objects.

1. Types of Privileges :

- SELECT : Allows users to read data.
- INSERT : Allows users to insert new records.
- UPDATE : Allows users to modify existing records.
- DELETE : Allows users to remove records.
- ALTER : Allows users to modify database structures, such as tables.
- DROP : Allows users to delete database objects like tables or databases.

2. Granting Privileges :

GRANT SELECT, INSERT ON database.table TO  
'username'@'host';

8. Revoking privileges:

```
REVOKE INSERT ON database.table FROM  
'username' @ 'host';
```

③ What is index? explain types of index.

→

An index is a database object that improves the speed of data retrieval operations on a database table. It provides a way to quickly locate and access the data without having to search every row in the table.

Types of Indexes:

1. Single - Column Index:

```
CREATE INDEX index-name ON table-name  
(column-name);
```

2. Composite Index:

```
CREATE INDEX index-name ON table-name  
(column1, column2)
```

3. Unique Index:

```
CREATE UNIQUE INDEX index-name ON  
table-name (column-name);
```

4. Full-Text Index:

```
CREATE FULLTEXT INDEX index-name ON  
table-name (column-name);
```



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④. What is transaction management? Explain ACID Properties.

→ Transaction management involves ensuring that database operations are performed in a reliable and consistent manner. A transaction is a sequence of operations performed as a single logical unit of work. Transactions must be managed to ensure data integrity and consistency.

#### ACID Properties :-

ACID is an acronym that describes the four properties of a transaction :-

##### 1. Atomicity :-

- A transaction is an indivisible unit of work. Either all operations within the transaction are executed, or none are. If one part of the transaction fails, the entire transaction fails and the database is left unchanged.

- Example: In a bank transfer, both the debit and credit operations must succeed, or neither should.

##### 2. Consistency :-

- A transaction brings the database from one consistent state to another consistent state. The database rules and constraints must be maintained before.

and after the transaction.

- Example: If a database requires that account balances be non-negative, this rule must hold true after any transaction.

### 3. Isolation:

- Transactions should be executed independently of either other transactions. The intermediate state of a transaction is invisible to other transactions until it is completed.
- Example: If two transaction is committed, the changes made by the transaction are per are running simultaneously, one transaction should not see the intermediate results of the other.

### 4. Durability:

- Once a transaction is committed, the changes made by the transaction are permanent, even in the event of a system failure.
- Example: After a transaction commits, the changes are written to non-volatile storage and will persist despite a power outage.