1. What’s the difference between batch, script, transaction, Backup?
2. Batch: is a group of one or more SQL statements sent together as a single unit.

* All statements are sent and run at once.
* Batches are separated using GO.
* Variables declared in batch can’t be used in another batch unless you use stored procedure.

1. Script: is a full SQL file or collection of commands that can include multiple batches, comments, etc.

* Used for automation, setup or repeating tasks like creating database or inserting data.
* Stored as files used by developers to execute a series of tasks.

1. Transaction: is a logical unit of work made up of one or more SQL statements that must either all succeed or fail.

* Follows ACID properties (Atomicity, Consistency, Isolation, Durability).
* Controlled by [begin transaction] [commit] [rollback].

1. Backup: is a copy of the database at certain point, used to restore data in case of failure.

Types:

* Full backup.
* Different backup.
* Transaction log backup.

1. What meant by logging transaction and why this happens?

This means that every change made of the database is recorded in a special file called transaction log before it’s applied to the actual database.

Why does this happen?

* If server crash before a transaction finishes the transaction log can be used to Undo incomplete transaction or Redo committed transaction this ensure that data stay consistent and reliable.
* ACID Compliance (Especially Atomicity and Durability)
* Point-in-Time restore: you can restore data to specific moment.
* Replication and Auditing: Logs are also used in **replication** to mirror changes to another server and for **auditing**, to track what happened and when.

1. What’s the difference between soft delete and hard delete?

**1. Hard Delete**

Definition: The row is completely removed from the database.

Effect: Data is gone forever unless you have a backup or use a transaction log for recovery.

Command Used: DELETE or sometimes TRUNCATE

**2. Soft Delete**

Definition: The data is not actually removed from the table instead, it's marked as "deleted" using a **flag/column**, like IsDeleted, DeletedAt, etc.

Effect: The row still exists but is excluded from queries.

1. What is trigger and why use it

Is a special type of stored procedure that automatically run when certain event happen in table or view.

Why to use it : to automate tasks, enforce rules and track changes in your database.

1. What is permissions and how w grant and revoke it

Determine who can do what in database.

ex. Who can read data, who can insert, update or delete data etc.

How to grant permission: use grant statement to give user certain permission.

Ex. GRANT SELECT ON Employees TO Abdo;

How to revoke: use REVOKE statement

Ex. REVOKE SELECT ON Employees FROM Abdo;