

COMP 353 - Databases

7th Session

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Agenda

- SQL Transactions
- ACID Properties
- Begin
- Commit
- Rollback
- Savepoint

ACID

ACID : Atomicity + Consistency + Isolation + Durability

ACID are the four properties of relational database systems that help in making sure that we are able to perform the transactions in a reliable manner.

ACID

- Atomicity: each statement in a transaction (to read, write, update or delete data) is treated as a single unit. Either the entire statement is executed, or none of it is executed.
- Consistency: ensures that transactions only make changes to tables in predefined, predictable ways. Transactional consistency ensures that corruption or errors in your data do not create unintended consequences for the integrity of your table.
- Isolation: when multiple users are reading and writing from the same table all at once, each request can occur as though they were occurring one by one, even though they're actually occurring simultaneously.
- Durability - ensures that changes to your data made by successfully executed transactions will be saved, even in the event of system failure.

SQL Transactions

Transactions are units or sequences of work accomplished in a logical order. Moreover, the purpose of it to ensure data integrity and to handle database errors while processing.

They are utilized for ACID properties.

BEGIN

Begin is the keyword that is used to commence a transaction. It, moreover, marks the point at which the data referenced by a connection is logically consistent.

After the BEGIN statement, the transaction is considered as a “open transaction” and remains so until it is committed or rolled backed.

COMMIT

The Commit command is used to save all the modifications made by current transaction to the database. Hence, it is a way to ending your transaction.

Note: After running Commit statement, it cannot be rolled back, and thus, you cannot undo the opration(s).

ROLLBACK

Instruction that undoes an unsuccessful or unsatisfactory running transaction. Furthermore, all the operations are undone and the dataset is restored to its last statement before running the transaction.

Example: Create the order, if the customer has the sufficient balance.

SAVEPOINT

A way of implementing subtransactions (nested transaction) within a relational database management system by indicating a particular point within a transaction that a user can “roll back” to in case of failure.

It means, it allows you to revert the changes made to the database after the save point without having to discard the entire transaction.

Example: Save last huge order for a customer.



An abstract background featuring overlapping curved bands in shades of orange and yellow, creating a sense of depth and motion.

Any Question?