

# Chapter 10:



## Advanced RDBMS Concepts

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### Informatics Practices

Class XII (CBSE Board)



Revised as per  
CBSE  
Curriculum  
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# What is Database Transaction?

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- ❑ In general, an event of access or modify the record from a database is called Database Transaction.
  - ❑ **A Transaction is a Logical Unit of Work (LUW) on the database that must succeed or fail entirely.**
  - ❑ A database transaction may contains several statement or commands but works as an atomic operation on the database.
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# Properties of a Transaction (**ACID** Properties)

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A Transaction possesses the following **ACID** properties.

❑ **Atomicity: (All-or-None)**

A transaction is executed entirely or none. No any transaction is allowed to run partially.

❑ **Consistency:**

A transaction must leave the database in Consistent state after completion. No any transaction is allowed to leave the database in In-consistent state, because before execution it was in consistent state.

❑ **Integrity:**

Transaction is an atomic unit, it must be executed independently, no any other transaction should interfere during the execution of a transaction to avoid conflicts.

❑ **Durability:**

The changes made by the transaction are permanent in nature i.e. effect of a transaction is recorded permanently.

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# Database Transaction – an example

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A transaction may contains several commands like SELECT, DELETE and UPDATE etc. to perform an specific action (work) on the database.

Suppose an amount of 1000/- is transferred from Ajay' s account (AccountNo 1005) to Mohan's Account (Account No 1102), in ACCOUNT table, then it can be represented as-

```
mysql> START TRANSACTION;
```

```
mysql> UPDATE ACCOUNT SET Balance = Balance-1000  
Where AccountNo=1005;
```

Ajay's Balance is debited

```
mysql> UPDATE ACCOUNT SET Balance = Balance+1000  
Where AccountNo=1102;
```

```
Mysql> COMMIT;
```

Mohan's Balance is credited

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# Transaction Control Statements in MySQL

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MySQL offers the following Transaction handling statements-

## ❑ **START TRANSACTION**

Represents the start of a transaction.

## ❑ **COMMIT [Work]**

Represents the end of a transaction. It saves all the changes on a database permanently.

## ❑ **SAVEPOINT <Savepoint\_Name>**

It creates a flag or mark during the execution of transaction which can be used to cancel the transaction partially, if required.

## ❑ **ROLLBACK [To SAVEPOINT <savepoint\_Name>]**

It cancels the effect of a transaction and restores the previous state of the database (works like UNDO operation). A partial rollback can be done using Save Points created in the transaction.

## ❑ **Set Autocommit**

If **Autocommit** is Enabled , the changes are immediately saved after completion of the command, without using **Commit** command explicitly.

```
mysql> Set Autocommit=1; (enables Autocommit feature)
```

```
mysql> Set Autocommit=0; (disables Autocommit feature)
```

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# Save Points and Rollback of Transactions

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Save Points are flag or marker created during the execution of transaction which can be used to cancel the transaction partially.


**Example :**

```
mysql> SET AUTOCOMMIT=0;
mysql> START TRANSACTION;
mysql> UPDATE ....
mysql> SAVEPOINT m1;
mysql> INSERT INTO .....
mysql> UPDATE ....
Mysql> ROLLBACK TO SAVPOINT m1;
Mysql> COMMIT;
```



Effects of INSERT & UPDATE command upto Savepoint m1 will be cancelled.. (Partial Rollback)

```
Mysql> SET AUTOCOMMIT=0;
mysql> START TRANSACTION;
mysql> UPDATE ....
mysql> SAVEPOINT m1;
mysql> INSERT INTO .....
mysql> UPDATE ....
Mysql> ROLLBACK;
Mysql> COMMIT;
```



Transaction will be Roll-backed upto begin of transaction...

# Autocommit and Rollback

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MySQL offers AUTOCOMMIT feature, which automatically commits changes immediately after execution of command in the transactions, if it is enabled (i.e. SET AUTOCOMMIT=1)

**Example :**

```
mysql> SET AUTOCOMMIT=0;
mysql> START TRANSACTION;
mysql> INSERT ....
mysql> .....
Mysql> ROLLBACK;
```

Record is not inserted, since it is undone by Rollback command.

```
mysql> SET AUTOCOMMIT=1
mysql> START TRANSACTION;
mysql> INSERT INTO.....
Mysql> ....
Mysql> ROLLBACK;
```

Record is added and automatically committed too... (since Autocommit is enabled.)



Once a transaction has been committed(saved) by Commit command Or AUTOCOMMIT, it can't be rolled back.

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