

# SOS IN COMPUTER SCIENCE AND APPLICATIONS

BCA-205 DBMS

UNIT-5

TOPIC: TRANSACTION IN DBMS

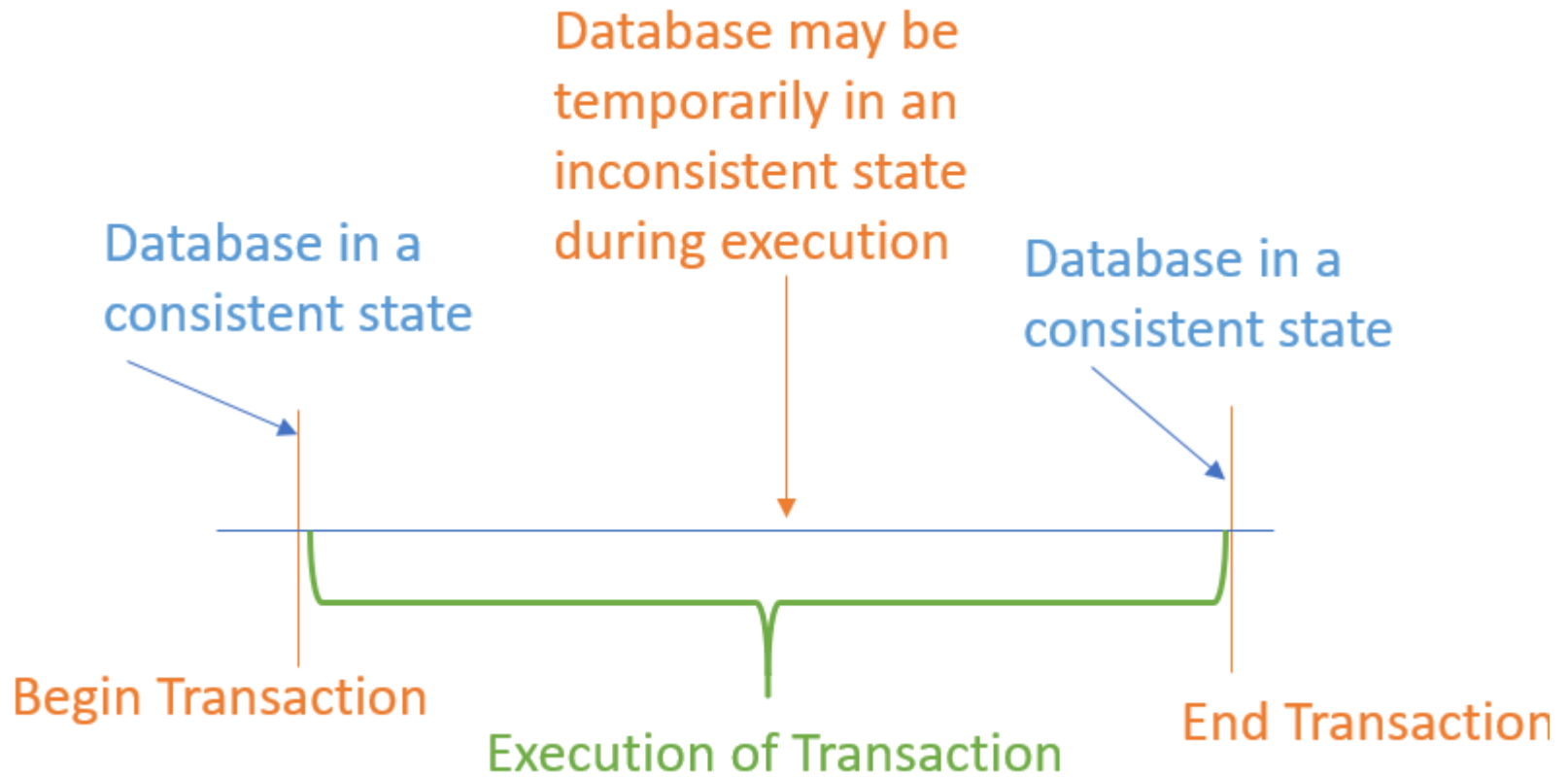
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# TRANSACTION

- A transaction can be defined as a group of tasks.
- A transaction is a logical unit of processing in a DBMS which entails one or more database access operation.
- All types of database access operation which are held between the beginning and end transaction statements are considered as a single logical transaction.
- During the transaction the database is inconsistent.
- Only once the database is committed the state is changed from one consistent state to another.

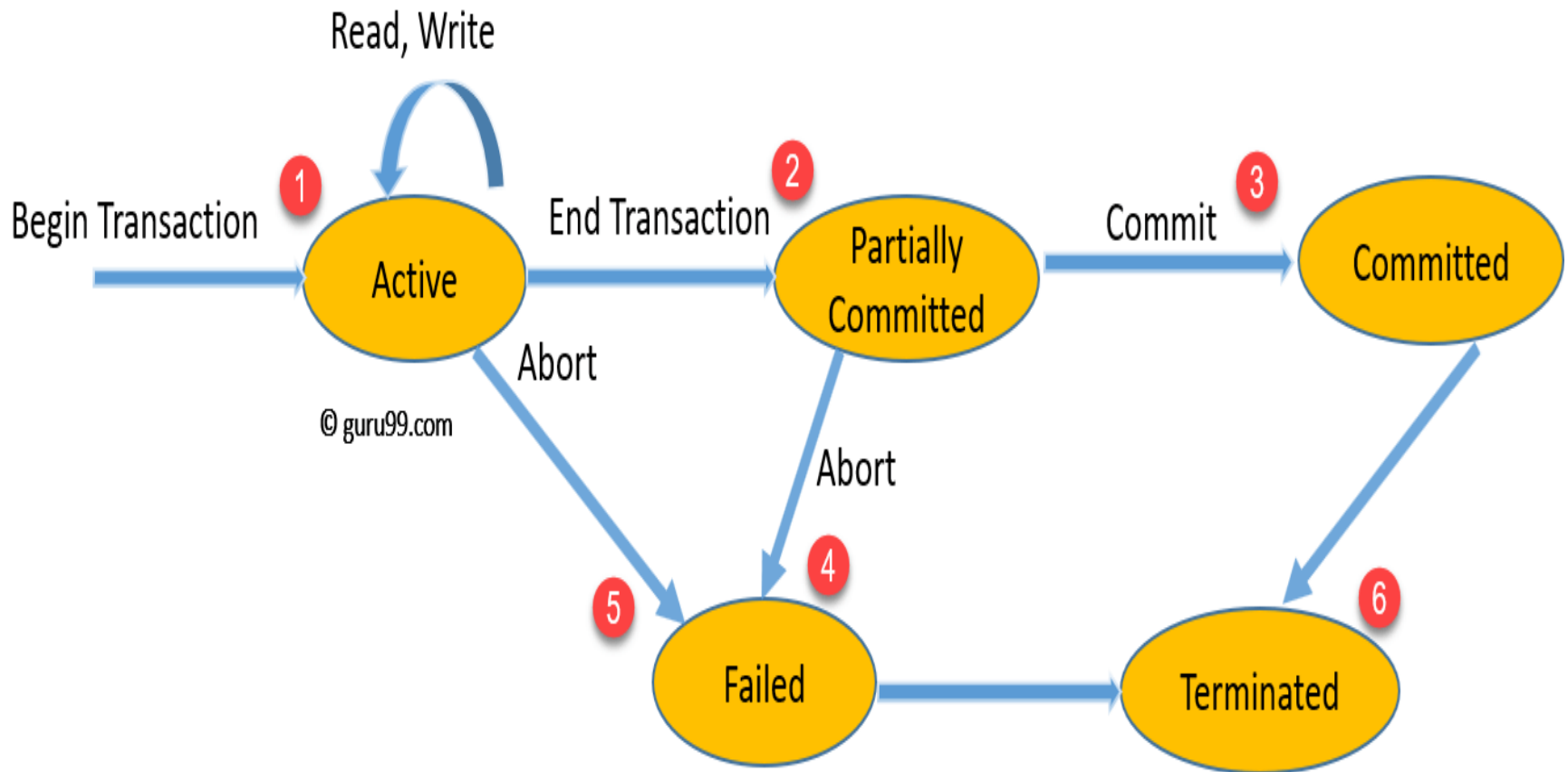
# TRANSACTION



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- A transaction is a program unit whose execution may or may not change the contents of a database.
- The transaction is executed as a single unit
- If the database operations do not update the database but only retrieve data, this type of transaction is called a read-only transaction.
- A successful transaction can change the database from one consistent state to another.
- DBMS transactions must be atomic, consistent, isolated and durable.
- If the database were in an inconsistent state before a transaction, it would remain in the inconsistent state after the transaction.

# State Transition Diagram for a Database Transaction



# States of Transactions

## 1. Active State→

A transaction enters into an active state when the execution process begins. During this state read or write operations can be performed.

## 2. Partially Committed→

A transaction goes into the partially committed state after the end of a transaction.

# States of Transactions

## 3. Committed State →

When the transaction is committed to state, it has already completed its execution successfully. Moreover, all of its changes are recorded to the database permanently.

## 4. Failed State →

A transaction considers failed when any one of the checks fails or if the transaction is aborted while it is in the active state.

# States of Transactions

## 5. Terminated State →

State of transaction reaches terminated state when certain transactions which are leaving the system can't be restarted.



## ***How Transaction moves from one state to another?***

1. Once a transaction starts execution, it becomes active. It can issue READ or WRITE operation.
2. Once the READ and WRITE operations complete, the transactions becomes partially committed state.
3. Next, some recovery protocols need to ensure that a system failure will not result in an inability to record changes in the transaction permanently.
4. If this check is a success, the transaction commits and enters into the committed state.

## ***How Transaction moves from one state to another?***

5. If the check is a fail, the transaction goes to the Failed state.
6. If the transaction is aborted while it's in the active state, it goes to the failed state.
7. The transaction should be rolled back to undo the effect of its write operations on the database.
8. The terminated state refers to the transaction leaving the system.