Cascading Rollback | Cascadeless Schedule

Akshay Singhal Database Management System

Recoverability-

Before you go through this article, make sure that you have gone through the previous article on **Recoverability in DBMS**.

We have discussed-

- Non-serial schedules which are not serializable are called as non-serializable schedules.
- Non-serializable schedules may be recoverable or irrecoverable.

Recoverable Schedules-

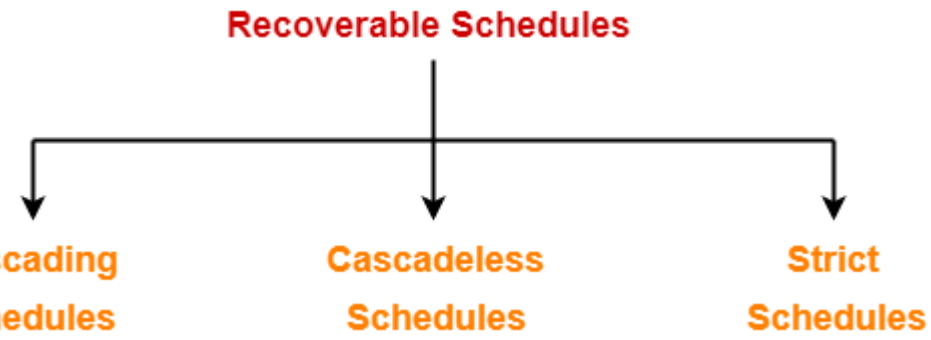
If in a schedule,

- A transaction performs a dirty read operation from an uncommitted transaction
- And its commit operation is delayed till the uncommitted transaction either commits or roll backs

then such a schedule is called as a **Recoverable Schedule**.

Types of Recoverable Schedules-

A recoverable schedule may be any one of these kinds-

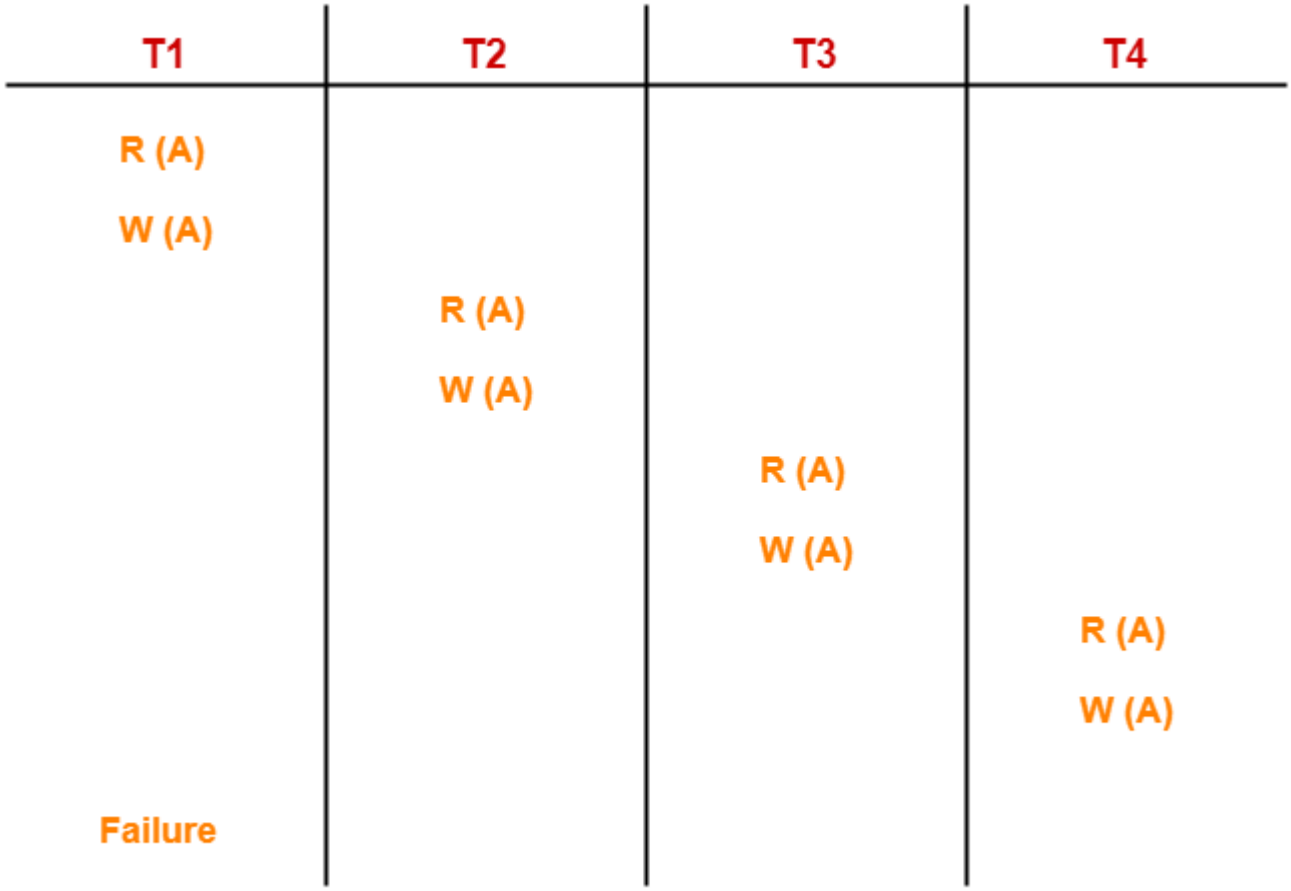


1. Cascading Schedule
2. Cascadeless Schedule
3. Strict Schedule

Cascading Schedule-

- If in a schedule, failure of one transaction causes several other dependent transactions to rollback or abort, then such a schedule is called as a **Cascading Schedule** or **Cascading Rollback** or **Cascading Abort**.
- It simply leads to the wastage of CPU time.

Example-



Cascading Recoverable Schedule

Here,

- Transaction T2 depends on transaction T1.
- Transaction T3 depends on transaction T2.
- Transaction T4 depends on transaction T3.

In this schedule,

- The failure of transaction T1 causes the transaction T2 to rollback.
- The rollback of transaction T2 causes the transaction T3 to rollback.
- The rollback of transaction T3 causes the transaction T4 to rollback.

Such a rollback is called as a **Cascading Rollback**.

NOTE-

If the transactions T2, T3 and T4 would have committed before the failure of transaction T1, then the schedule would have been irrecoverable.

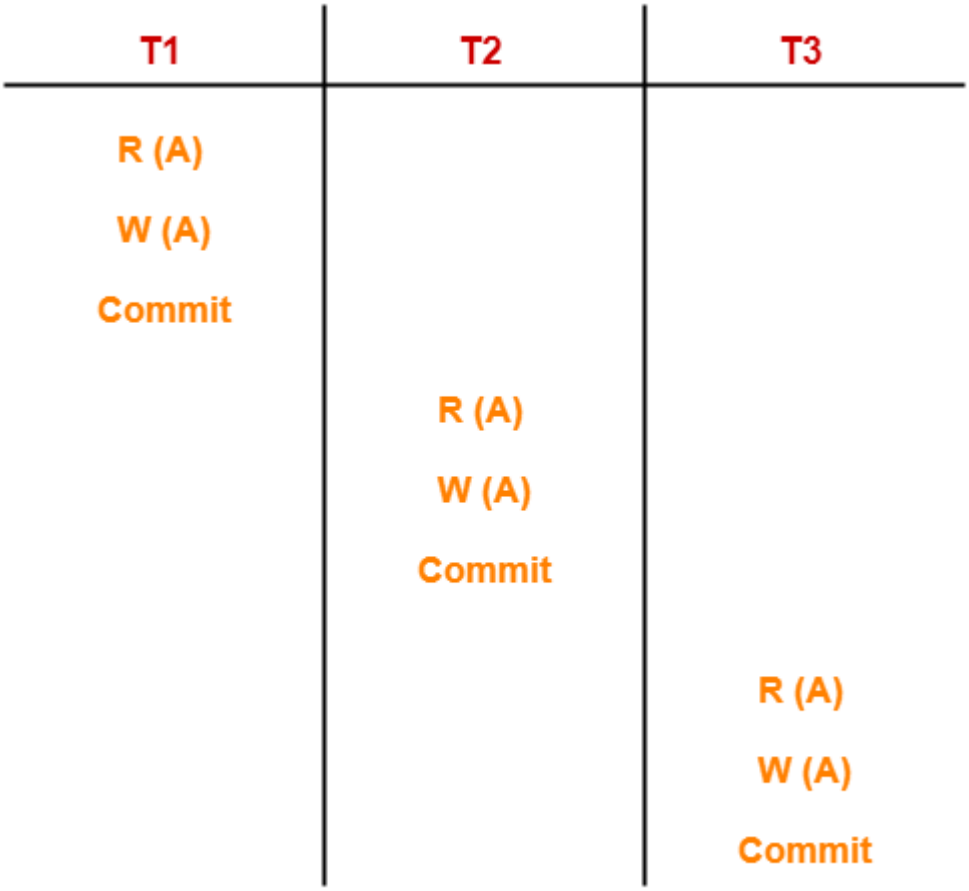
Cascadeless Schedule-

If in a schedule, a transaction is not allowed to read a data item until the last transaction that has written it is committed or aborted, then such a schedule is called as a **Cascadeless Schedule**.

In other words,

- Cascadeless schedule allows only committed read operations.
- Therefore, it avoids cascading roll back and thus saves CPU time.

Example-

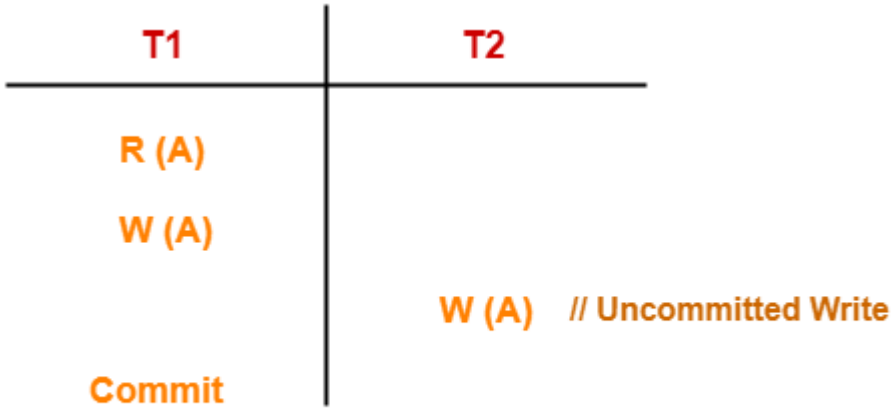


Cascadeless Schedule

NOTE-

- Cascadeless schedule allows only committed read operations.
- However, it allows uncommitted write operations.

Example-



Cascadeless Schedule

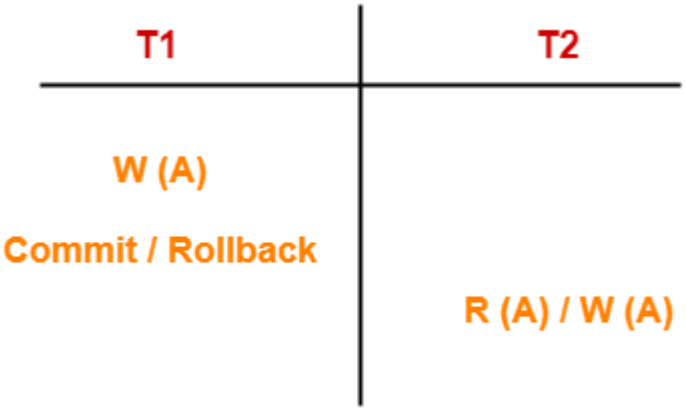
Strict Schedule-

If in a schedule, a transaction is neither allowed to read nor write a data item until the last transaction that has written it is committed or aborted, then such a schedule is called as a **Strict Schedule**.

In other words,

- Strict schedule allows only committed read and write operations.
- Clearly, strict schedule implements more restrictions than cascadeless schedule.

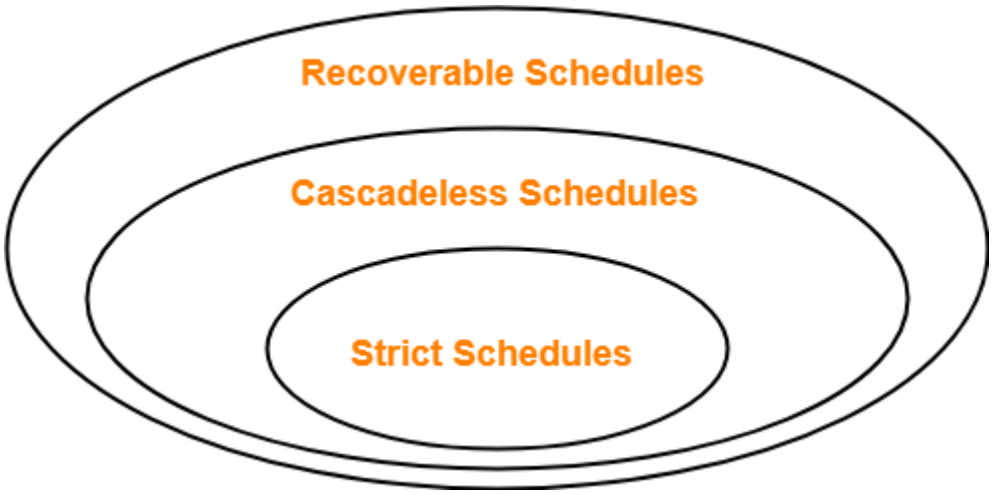
Example-



Strict Schedule

Remember-

- Strict schedules are more strict than cascadeless schedules.
- All strict schedules are cascadeless schedules.
- All cascadeless schedules are not strict schedules.



Next Article- Equivalence of Schedules

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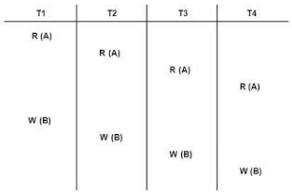
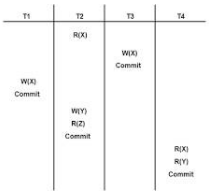
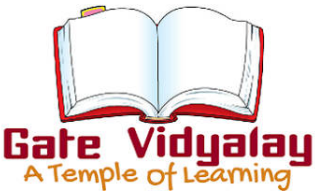


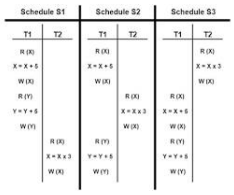
View Serializability in DBMS | Practice Problems



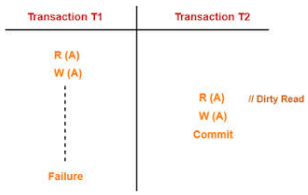
Conflict Serializability | Practice Problems



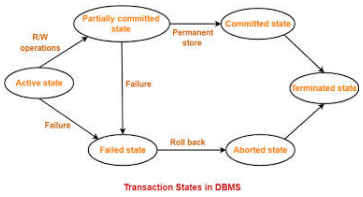
View Serializability in DBMS



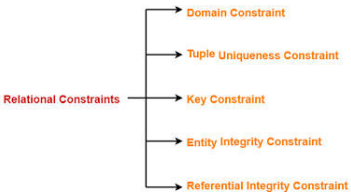
Equivalence of Schedules | Equivalent Schedules in DBMS



Concurrency Problems | DBMS



Transaction States in DBMS



Constraints in DBMS | Types of Constraints in DBMS

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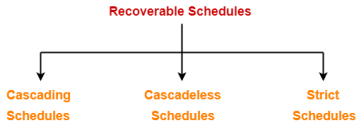
Summary



Article Name	Cascading Rollback | Cascadeless Schedule
Description	Recoverable Schedules in DBMS are of three types- Cascading Rollback Schedule or Cascading Abort, Cascadeless Schedule and Strict Schedule. Cascadeless schedules are less strict than strict schedules.
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