

TRANSACTION AND IT'S DESIRABLE PROPERTIES

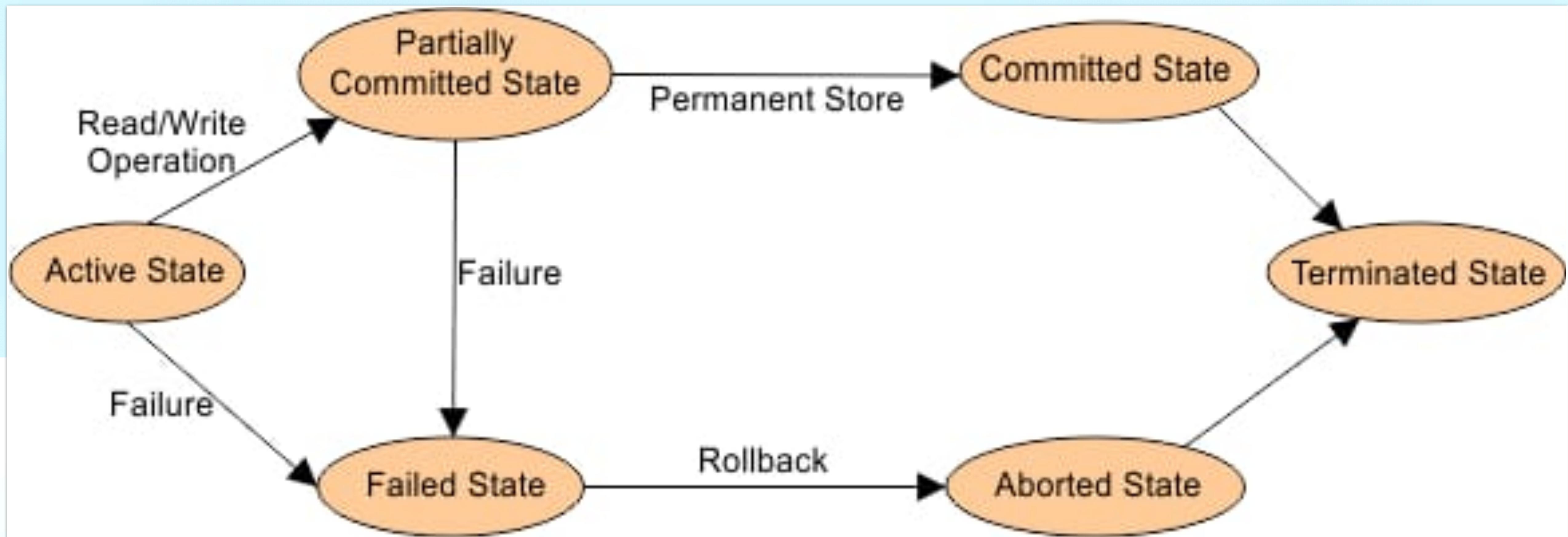
“BEGINNING IS THE KEY TO SUCCESS..!”

TRANSACTION:

- A transaction is an atomic unit of work that should either be completed in its entirety or not done at all. For recovery purposes, the system keeps track of start of a transaction, termination, commit or aborts.

Types of transaction states:

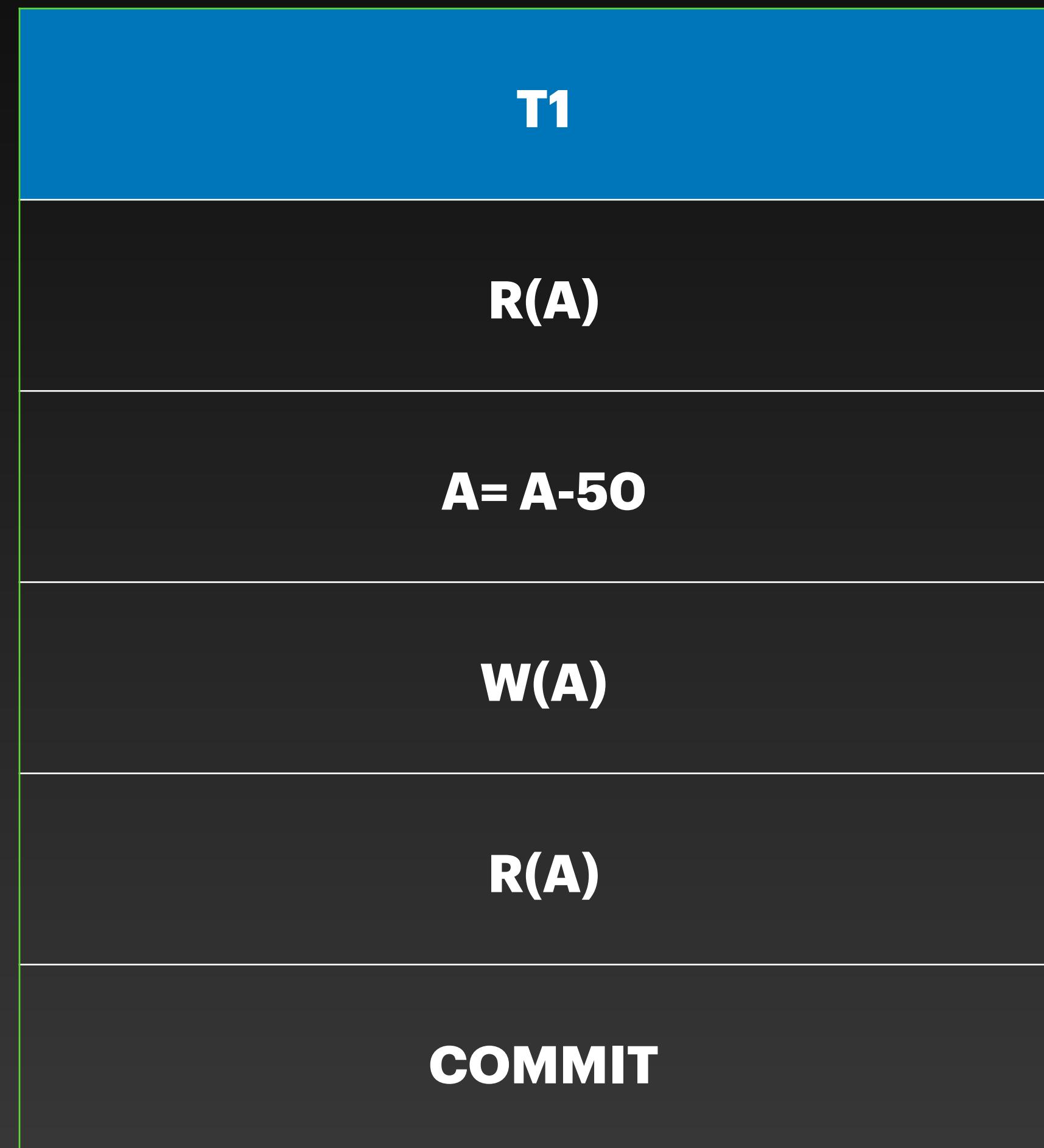
- BEGIN_TRANSACTION:- marks the beginning of transaction execution.
- READ OR WRITE:- specify READ and WRITE operation on the database items that are executed as part of a transaction.
- END_TRANSACTION:- specifies that READ and WRITE transaction operations have ended and marks the end of transaction execution.
- COMMIT_TRANSACTION:- signals a successful end of the transaction so that any changes (updates) executed by the transaction can be safely committed to the database and will not be undone.
- ROLLBACK:- signals that the transactions has ended unsuccessfully, so that any changes or effects that the transaction may have applied to the database must be undone.



States of Transaction in DBMS

Desirable Properties of Transaction:

- Transaction should possess several properties, often called the ACID properties:-
- i) Atomicity: a transaction is an atomic unit of processing and it is either performed entirely or not at all.
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- ii) Consistency Preservation: a transaction should be consistency preserving that is it must take the database from one consistent state to another.
- iii) Isolation/Independence: a transaction should appear as though it is being executed in isolation from other transaction, even though many transactions are executed concurrently.
- iv) Durability (or Permanency): if a transaction changes the database and is committed, the changes must never be lost because of any failure.
- After a transaction it updates the record in the database permanently.

CHARACTERIZING SCHEDULE BASED ON RECOVERABILITY



SCHEDULE

It's a chronological execution sequence of multiple transaction

Serial Schedule:

- In which transaction are executed in sequential manner and no other transaction is allowed to executed till the first on going transaction has been completed.

T1	T2
R(A)	
W(A)	
COMMIT	
	R(A)
	W(A)
	COMMIT

Parallel schedule:

- Unlike the serial schedule where one transaction must wait for another transaction to be complete all it's operation in the parallel schedule the other transaction proceeds without waiting for the previous transaction to completed.
- Multiple transaction can be executed at 1 time.

Conflicting Operation:

- Two operation in a schedule is said to be conflict if they satisfy all three of the following condition
 - 1. They belongs to different transaction
 - 2. They access the same item.
 - 3. At least one the operation in write _item

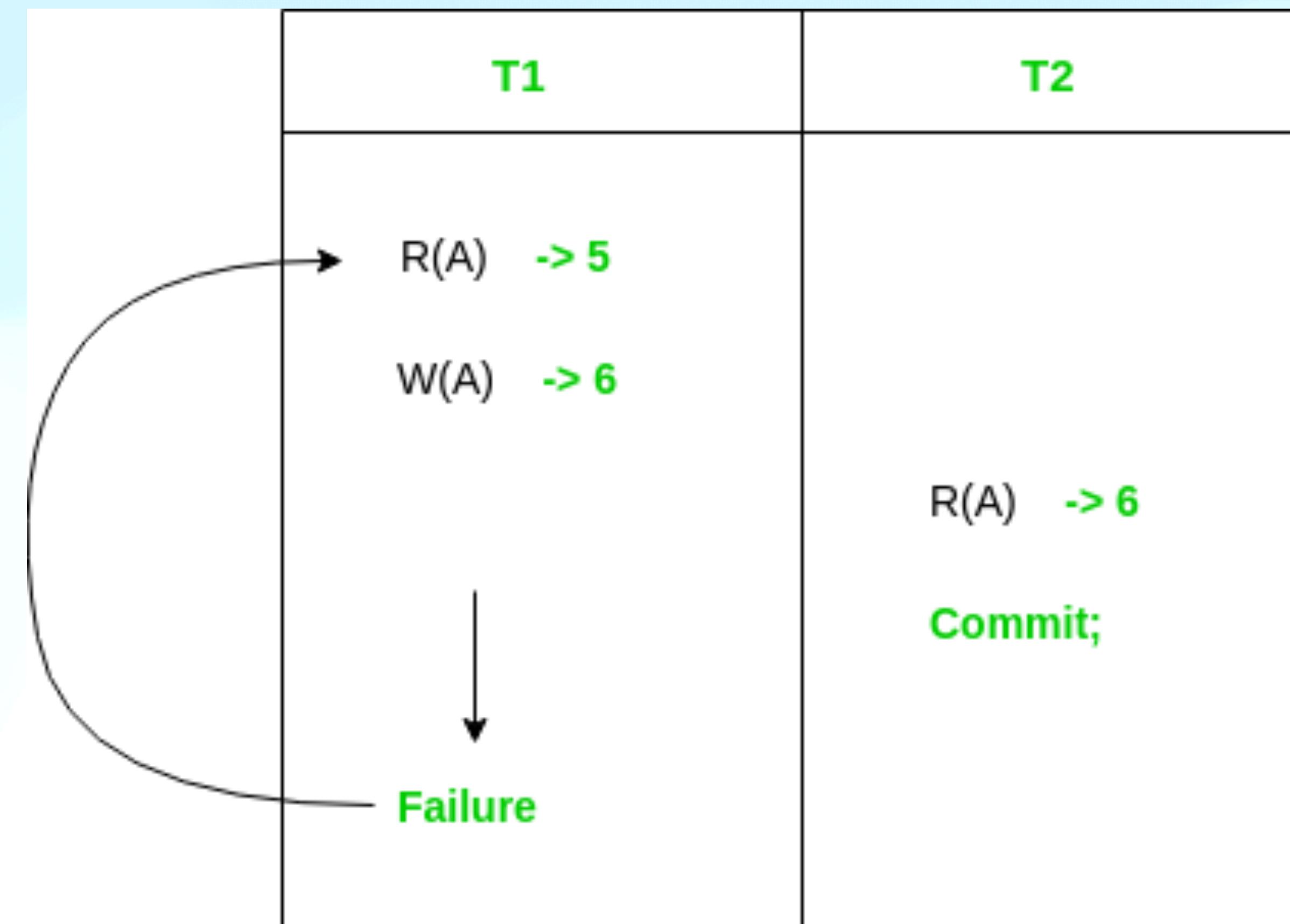
* Conflicting Operation:

- $r_1(X)$ conflicts with $w_2(X)$
- $r_2(X)$ conflicts with $w_1(X)$
- $w_1(X)$ conflicts with $w_2(X)$
- $r_1(X)$ do not conflicts with $r_2(X)$

Schedule Classified on Recoverability:

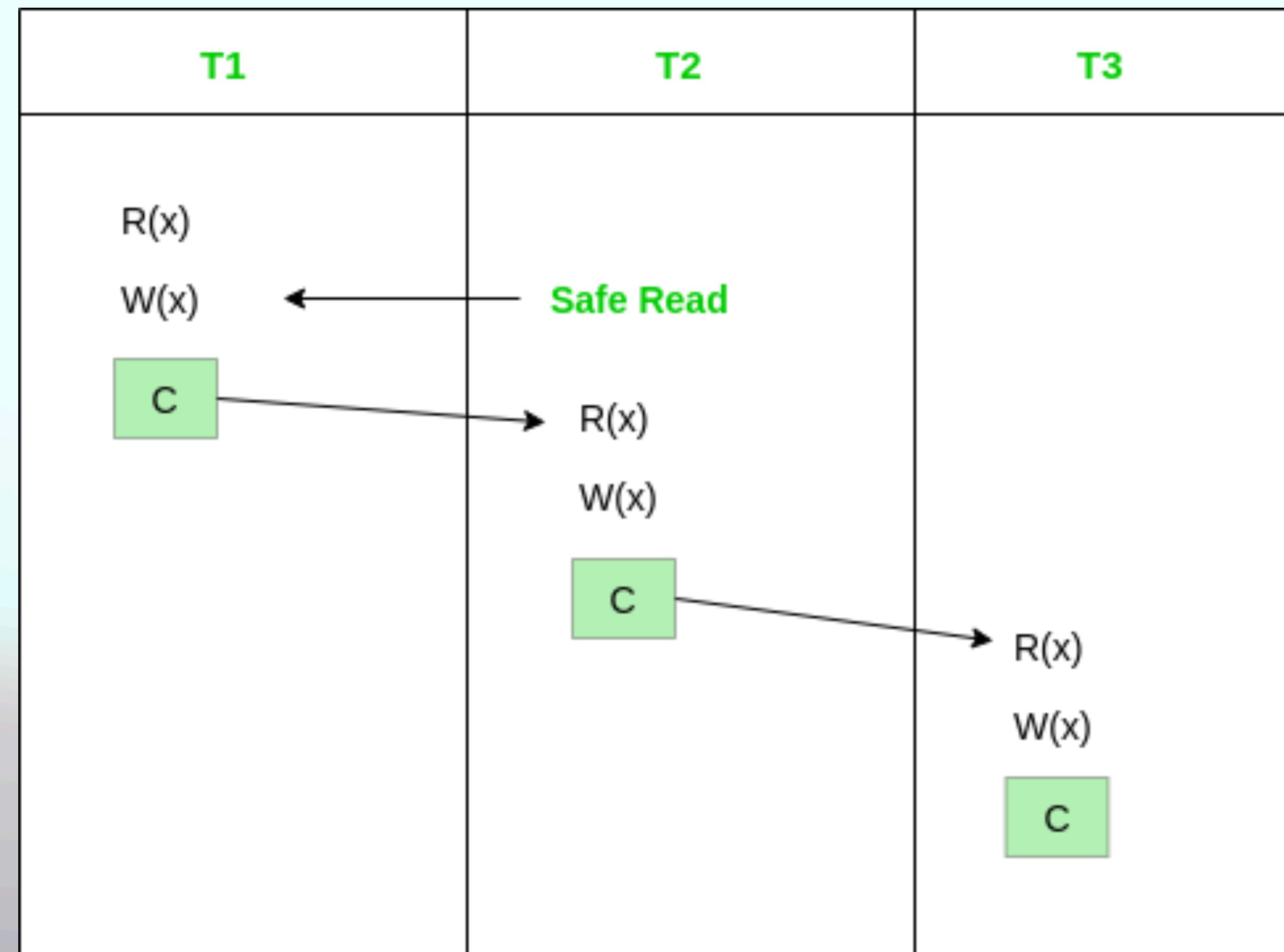
* Recoverable Schedule:

- A schedule is said to be recoverable if it is recoverable as name suggest. Only reads are allowed before write operation on same data.



Cascadeless Schedule:

- When no **read** or **write-write** occurs before execution of transaction then corresponding schedule is called cascadeless schedule.



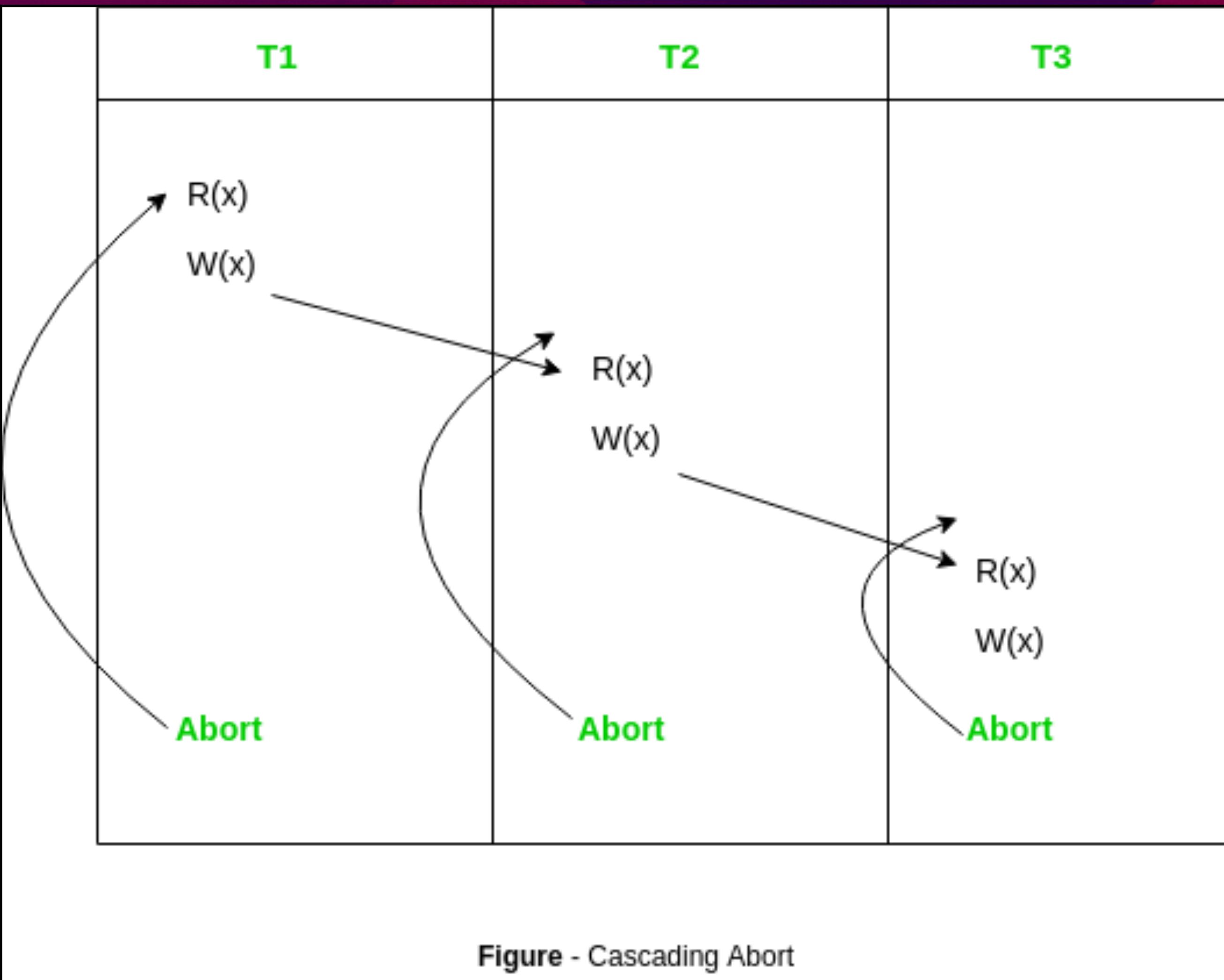
Strict Schedule:

- if schedule contains no **read** or **write** before commit then it is known as strict schedule. Strict schedule is strict in nature.

T1	T2
R(A)	
W(A)	
COMMIT	
	R(A)
	COMMIT

Cascading Abort:

- Cascading Abort can also be rollback. If transaction T1 abort as T2 read data that written by T1 which is not committed. Hence it's cascading rollback.



Thank
You

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