Q: $\{A \rightarrow C \quad AC \rightarrow D \quad E \rightarrow H \quad E \rightarrow A \quad E \rightarrow D\}$

Sol.
① $A \rightarrow C$, $AC \rightarrow D \quad E \rightarrow H \quad E \rightarrow A \quad E \rightarrow D$

② $A \rightarrow C \quad AC \rightarrow D \quad E \rightarrow H \quad E \rightarrow A$

③ $A^+ = \{A\ C\ D\} \qquad C^+ = \{C\}$

A closure contains C then C is extraneous
and it can be removed $\quad \{A \rightarrow D\}$

$A \rightarrow C \quad E \rightarrow H \quad E \rightarrow A \quad \underline{\underline{A \rightarrow D}}$

Q: Minimize $\{A \rightarrow C \quad AC \rightarrow D \quad E \rightarrow H \quad E \rightarrow A \quad E \rightarrow AD\}$

Sol.
① $A \rightarrow C \quad AC \rightarrow D \quad E \rightarrow H \quad E \rightarrow A \quad \cancel{E \rightarrow A} \quad E \rightarrow D$

② ① $\underline{A \rightarrow C} \checkmark$ 　　② $\underline{AC \rightarrow D} \checkmark$
　　$A^+ = \{A\ B\}$ 　　　　　$AC^+ = \{A C\}$

③ $\underline{E \rightarrow H} \checkmark$ 　　④ $\underline{E \rightarrow A} \checkmark$
　$E^+ = \{E\ A\ D,\mathcal{C}\}$ 　　$E^+ = \{E\ H\ D\}$

⑤ $\underline{E \rightarrow D} \times$
　$E^+ = \{E\ A\ H\ CD\}$

$A \rightarrow C \quad AC \rightarrow D \quad E \rightarrow H \quad E \rightarrow A$

③ $AC \rightarrow D$

$A^+ = \{A\ C\}$ 　A closure contains C then
$C^+ = \{C\}$ 　C is extraneous and it
　$\{A \rightarrow D\}$ 　can be removed

$A \rightarrow C \quad \cancel{E \rightarrow H} \quad \underline{\underline{E \rightarrow A}} \quad A \rightarrow D$

$A \rightarrow C$ $A \rightarrow D$ $E \rightarrow HA$

Assignment:

Q1. Minimize $\{AB \rightarrow C, D \rightarrow E, AB \rightarrow E, E \rightarrow C\}$

Transaction Processing Concepts:

Transaction is a unit of program execution that access and possibile updates of various data items.

example: Account transaction of ₹50

read_from_account (A)

$A := A - 50$

write_to_account (A)

read_from_account (B)

$B := B + 50$

write_to_account (B)

- Read
- Write
- Arithemetic op.

failures

- failure hardware
- Software failure
- Network failure
- Sytem Crashes
- Multiple user failure transaction failure

Desirable properties of Transaction:

ACID Properties

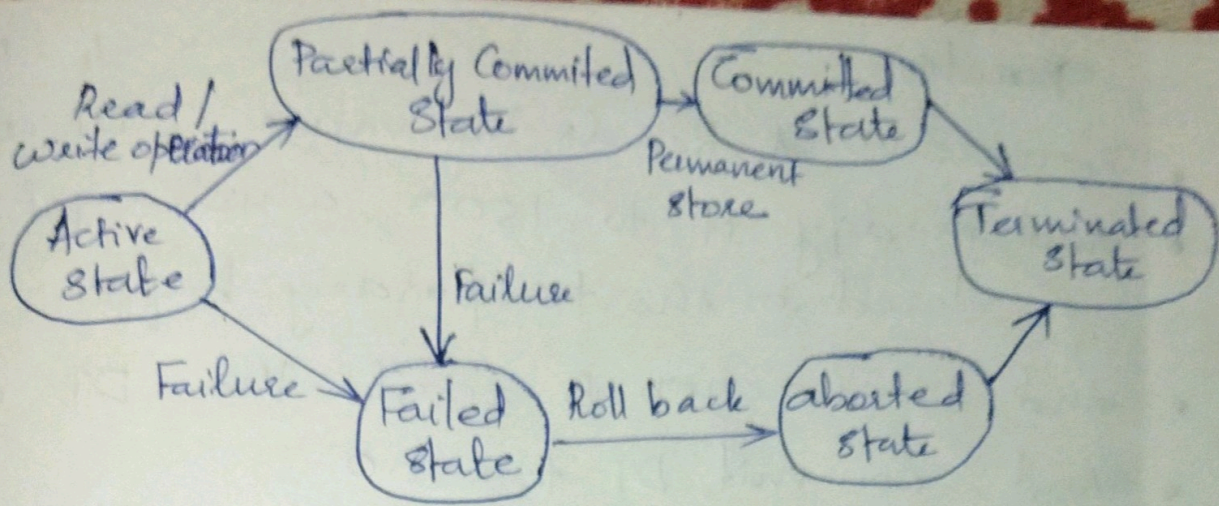- Atomicty
- Consistency
- Isolation
- Durability

- Atomicity: The entire transaction takes place at once or does not happen at all. partial transaction is not possible.

- Consistency: Before and after transaction the database the data must be consistent.

- Isolation: Multiple transaction occures independently without interfeeance

- Dureability: The changes of a successful transaction occures even if the system failure occures.

Transaction Model / Transaction State:

5 states of Transaction state:

1. Active state
2. Partially committed state
3. Failed State
4. Aborted State
5. committed State

Concurrency Control Mechanism:

It is the procedure of managering simutaniously there atomicity, consistency, isolation and Durability.

Concurrency Control problems:

Dirty Deed Problem:

In dirty deed problem occurs when a transaction reads the data that has been updated by another transaction that is still uncommitted

eg:

DT=1000

Time	A	B
T_1	Read (DT)	—
T_2	DT = DT + 500	—
T_3	WRITE (DT)	—
T_4	—	Read (DT)
T_5	—	Commit
T_6	Roll back	—

Reactio

- Transaction A Reads the value of DT as 1000
- And modify it to 1500 which get stored in the temporary buffer.

- And transaction B reads the DT as 1500
- And commit DT to 1500
- And value OT changes permanantly get changed to DB

- And server error occurs at A and it wants to roll back to its initial value that is 1000
- And thus the Dirty deed problem occurs