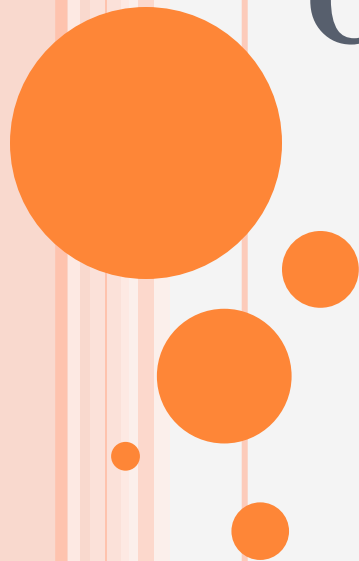
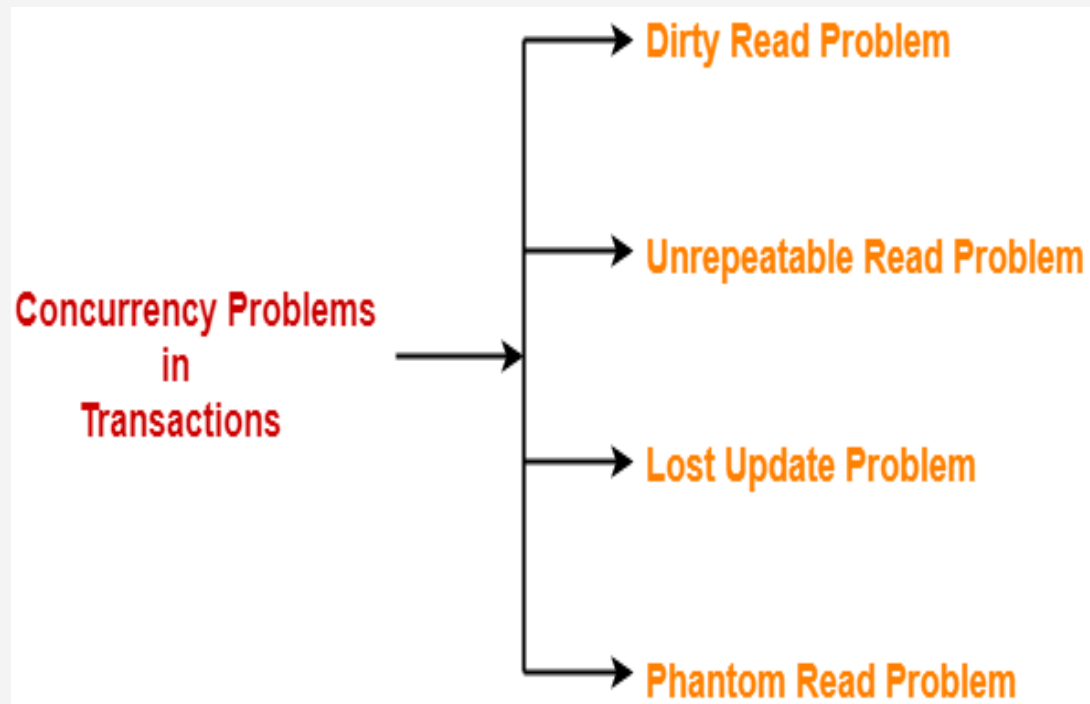


PROBLEMS IN CONCURRENT SCHEDULE



CONCURRENCY PROBLEMS

- When multiple transactions execute concurrently in an uncontrolled or unrestricted manner, then it might lead to several problems.
- Such problems are called as **concurrency problems**.



1. DIRTY READ PROBLEM

T2 reads the dirty value of A written by the uncommitted transaction T1.

T1 fails in later stages and roll backs.

Thus, the value that T2 read now stands to be incorrect.

Therefore, database becomes inconsistent.

Transaction T1	Transaction T2
R(A)	
W(A)	
	R(A) //Dirty Read
	W(A)
	Commit
Failure	



2. UNREPEATABLE READ PROBLEM

T2 gets to read a different value of X in its second reading.

T2 wonders how the value of X got changed because according to it, it is running in isolation.

Transaction T1	Transaction T2
R(X)	
	R(X)
W(X)	
	R(X) //Unrepeated Read

3. LOST UPDATE PROBLEM-



T1 writes the over written value of X in the database.

Thus, update from T1 gets lost.

This problem occurs whenever there is a write-write conflict.

In write-write conflict, there are two writes one by each transaction on the same data item without any read in the middle.

Transaction T1	Transaction T2
R(A)	
W(A)	
	W(A)
	Commit
Commit	

4. PHANTOM READ PROBLEM-

T2 finds that there does not exist any variable X when it tries reading X again.

T2 wonders who deleted the variable X because according to it, it is running in isolation.

Transaction T1	Transaction T2
R(X)	
	R(X)
Delete (X)	
	Read (X)



IDENTIFY THE TYPE OF PROBLEM

Transaction T1	Transaction T2
W(A)	
	R(A)
W (B)	
	R (B)



IDENTIFY THE TYPE OF PROBLEM

- **Serializable**
 $S=T1 \rightarrow T2$
- **Dirty Read**
- **But no WR problem**

Transaction T1	Transaction T2
W(A)	
	R(A)
W (B)	
	R (B)

PRACTICE PROBLEM:

IDENTIFY THE TYPE OF PROBLEM

Transaction T1	Transaction T2
R(A)	
W(A)	
	W(A)
	Commit
Commit	



PRACTICE PROBLEM SOLUTION:

Transaction T1	Transaction T2
R(A)	
W(A)	
	W(A)
	Commit
Commit	
<u>Lost Update Problem</u>	



PRACTICE PROBLEM:

IDENTIFY THE TYPE OF PROBLEM

Transaction T1	Transaction T2
R(X)	
	R(X)
W(X)	
	R(X)



PRACTICE PROBLEM SOLUTION:

Transaction T1	Transaction T2
R(X)	
	R(X)
W(X)	
	R(X) //Unrepeated Read



PRACTICE PROBLEM:

IDENTIFY THE TYPE OF PROBLEM

Transaction T1	Transaction T2
R(A)	
W(A)	
	R(A)
	W(A)
	Commit
Failure	



PRACTICE PROBLEM SOLUTION:

Transaction T1	Transaction T2
R(A)	
W(A)	
	R(A) //Dirty Read
	W(A)
	Commit
Failure	



THANKS!!