

## Agenda :-

Transactions

ACID properties

commit & Rollback

Isolation levels

- Read uncommitted<sup>a</sup>

- Read committed

- Repeatable reads

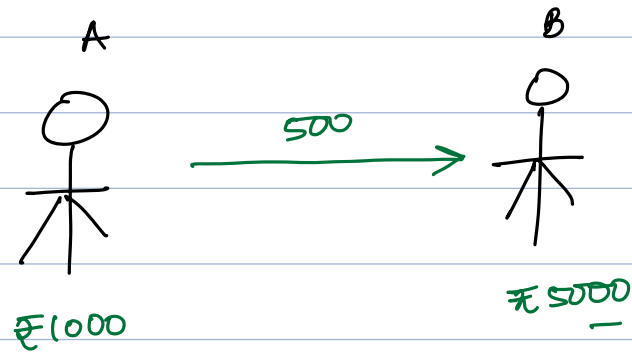
- Serializable

Dirty Reads

Phantom Reads

Deadlock.

contest will  
be shifted to  
next weekend<sup>o</sup>.



check/get Balance of A

↓  
balance  $\geq 500$

↓  
reduce balance of A       $A - 500$

↓  
update balance of B       $B + \underline{500}$

transfer Money ( from, to, Amount ) £

—  
—  
—

↳

check/get Balance of A

→ Read/Select

↓  
balance  $\geq 500$

↓  
reduce balance of A

$A - 500$

→ update/write

↓  
update balance of B

$B + 500$

temp = B → Read

temp = temp + 500

B = temp → write

A → B

a = 1000, b = 5000, amt = 500

C → B

c = 15000, b = 5000,  
c = 10,000

x ← read A

x = 1000

if (x ≥ amount)

A = 500

A = 1000 - 500

y = 5000 (B)

y = y + 500

→ 5500

B = 5500

↑

B = 15500

↑

x ← read C

x = 15000

if (x ≥ amount)

C = 5000

c = 15000 - 10000

y = 5000 (B)

y = 5000 + 10,000

→ 15000

B = 15000

↑

- 1) Inconsistent / Illogical state
- 2) complete operation might not take place

Transaction :- a set of db op<sup>n</sup> logically grouped together to perform certain task

↓  
expectations

ACID properties.

A : Atomicity  
C : Consistency  
I : Isolation  
D : Durability

Atomicity

smallest indivisible unit

broken further

should appear atomic/indivisible to the end user.

All or Nothing

A transaction should  
never end in an  
intermediate state.

Consistency  $\rightarrow$  slow ↓

- correctness
- Exactness
- Accuracy
- logically correct

Holstar  
1.6 cr people  $\rightarrow$  1.61

A  
 $x = 1.6 \text{ cr}$   
 $x + 1\%$   
1,60,00,001

B  
 $x = 1.6 \text{ cr}$   
 $x + 1\%$   
1,60,00,001

## Isolation



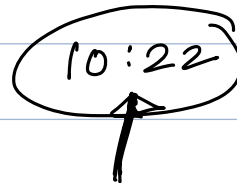
one transaction should not  
affect the other transaction =  
running at the same time  
& running on some  
data

## Durability

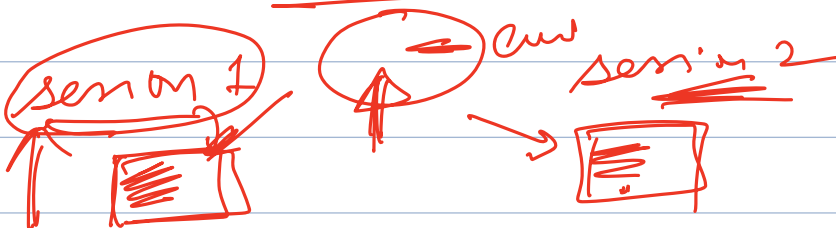


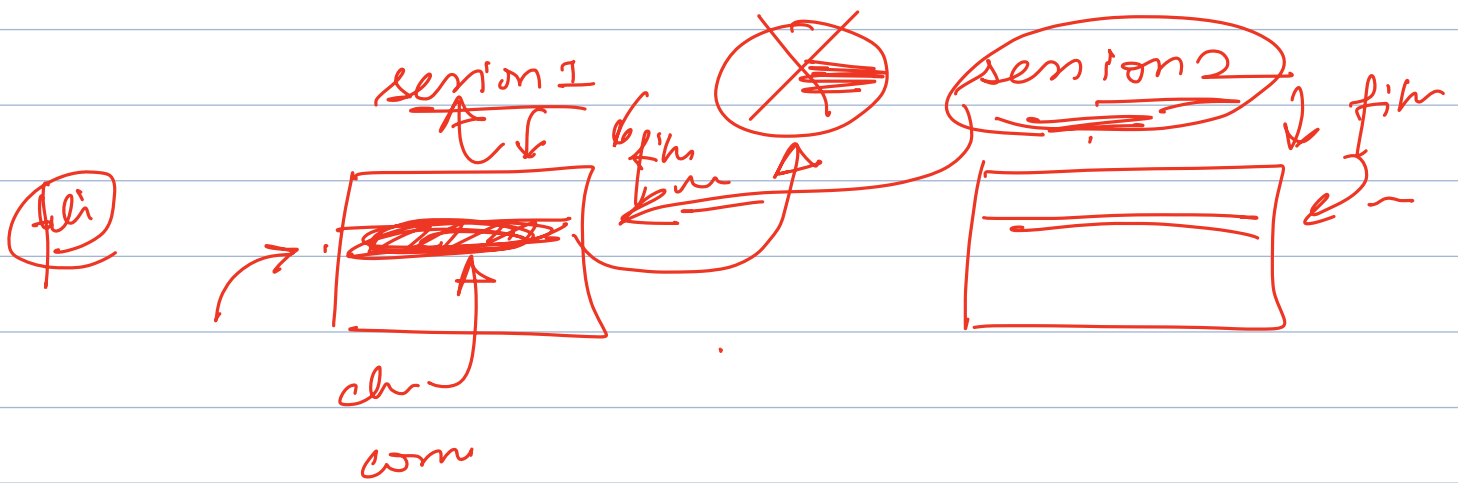
Once a trans<sup>n</sup> has completed, it  
should persist

10 min Break



session manager X





autocommit = true;

query → committed



## Isolation levels ::

### Read uncommitted

session 1



changes  
uncommitted

session 2



Read 2

original

S1 read committed

