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Assignment - 4

Q) Explain ACID properties of transcation with suitable example

soln
→ Eg:- Transcation to transfer money from account A to B.

1. Start transcation
2. Read (A)
3. A: = A + 1000
4. Write (A)
5. Read (B)
6. B:= B + 1000
7. Write (B)
8. Commit

→ Properties

1. Atomicity :- If the transcation fails after step 4 but before step 8 the updates on A should not be reflected in database

2. Consistency :- The sum of A & B should not be changed by transaction.

3. Isolation :- If another transaction is going to access the partially updated database betn 4 & 7 it will be an inconsisent

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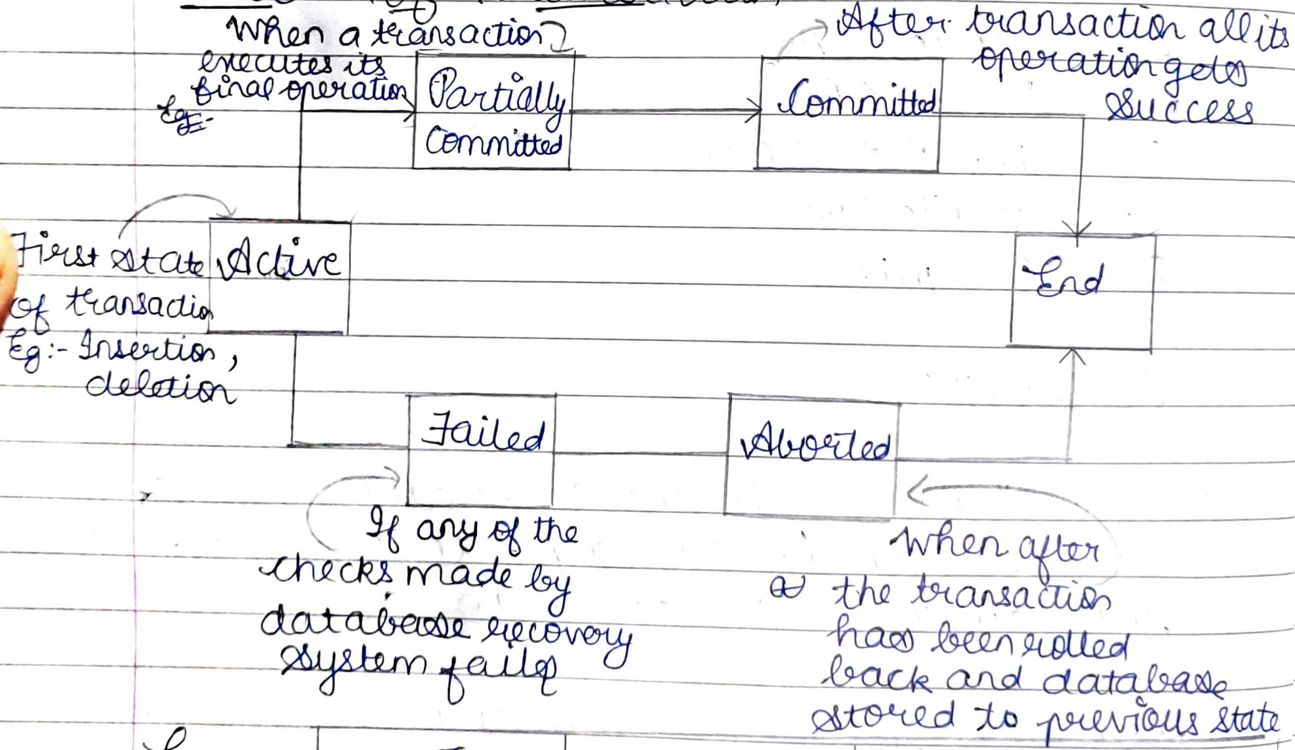
4) Durability : Once the money has been transferred from A & B the effect of the transaction must persist

2. Define Transaction Explain various state of transaction with suitable example.

=) A transaction can be defined as a group of tasks that form a single logic unit.

State of transaction


When a transaction executes its final operation
Eg:-
Partially Committed
Committed
After transaction all its operation gets success
First state of transaction
Eg:- Insertion, deletion
Active
End
Failed
Aborted
If any of the checks made by database recovery system fails
When after the transaction has been rolled back and database stored to previous state

Eg:-	T_1	T_2	
Read(A)	Read(A)		Assume A=100
	A+50		A=150
	Write(A)		
		Read(A)	A=150
		A=A+100	A=250
	RollBack		A=100(restore back)
		Write(A)	

4) Differentiate between conflict serializability and view serializability.

=)

	View serializability	Conflict serializability
1.	Two schedules are said to be view equivalent if the order of initial read, final write and update operations is the same in both the schedule. If a schedule is view equivalent to its serial schedule then its called view serialization	If T_1 & T_2 are two transcations and I_1 & I_2 are the instructions in T_1 & T_2 respectively. Then these two transcation are called conflict serializability
2.	If the schedule is conflict serializable then it is also view serializability	If the schedule is view serializable then is may or maynot be conflict serializability
3.	View serializability is difficult to achieve	It is easy to achieve by reordering the operations

6 Explain Deadlock with suitable example :

=) Deadlock is a situation in which when two or more transcations have got a lock and waiting for another locks currently held by one of the other transactions.

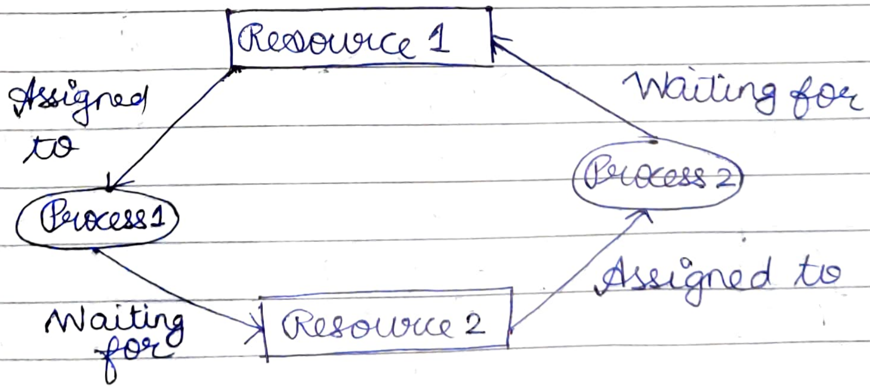
	T_1	T_2
1.	lock-X(B)	
2.	Read(B)	
3.	B=B-50	
4.	Write(B)	
5.		lock-S(A)
6.		read(A)
7.		lock-S(B)
8.	lock-X(A)	

Execution :-

(1.) T_1 holds an Exclusive lock over B, and T_2 holds a shared lock over A.

(2.) In statement 7, T_2 request for lock on B which waits for T_1 to release lock

(3.) In statement 8, T_1 request lock on A, which waits for T_2 to release lock.



6 Write short note on Log based recovery.

- When transaction Ti starts, it registers itself by writing a record <Ti start> to

The log

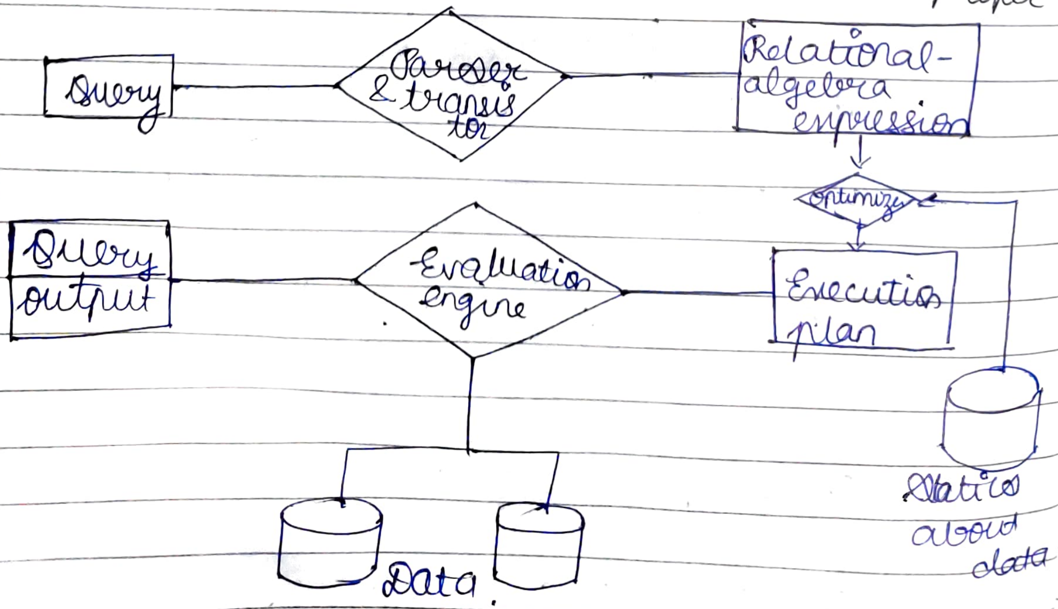
- Before T_i executes write (X), a log record $< T_i, X, V_1, V_2 >$ is written, where V_1 is the value of x before the write (the old value), and V_2 is the value to be written to X (new value)

- When T_i finishes it last statement, The log record $< T_i$ commit$>$ is written

- Undo of a log record $< T_i, X, V_1, V_2 >$ writes the old value V_1 to X.

- Redo of a log record $< T_i, X, V_1, V_2)$ writes the new value V_2 to X.

7. Explain query processing state OR Discuss various steps of query processing with proper



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Q: Explain Heuristics in optimization

=) Heuristics is a rule that leads to least cost in most of cases.

* **Steps**

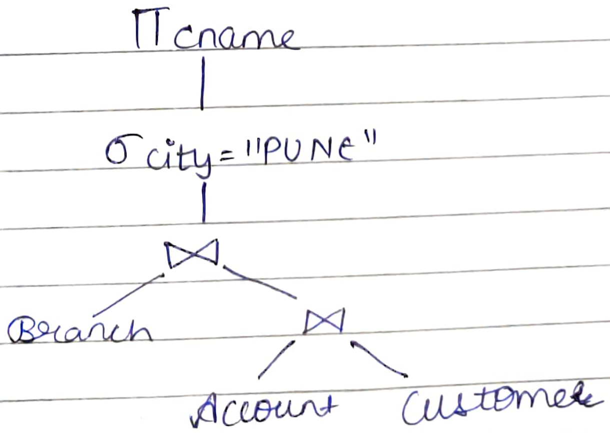
1. Scanner & parser generate initial query representation

2. Representation is optimized according to heuristic rules.

3. Query execution plan is developed.

Eg :-

$\sigma_{city = "PUNE"} (\Pi_{cname}\ Branch) \infty\ Account \infty$ customer



Πcname
σ city = "PUNE"
⋈
Branch
⋈
Account
Customer