



#ASLI ENGINEERING

Relational Databases

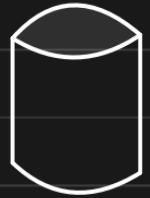


BY

ARPIT BHAYANI

Relational Databases

Databases are most critical component of any system. They make or break a system.



Data is stored & represented in rows and columns

History of relational databases → Computers, Internet, Blockchain

Everything "revolutionary" starts with Financial Applications!

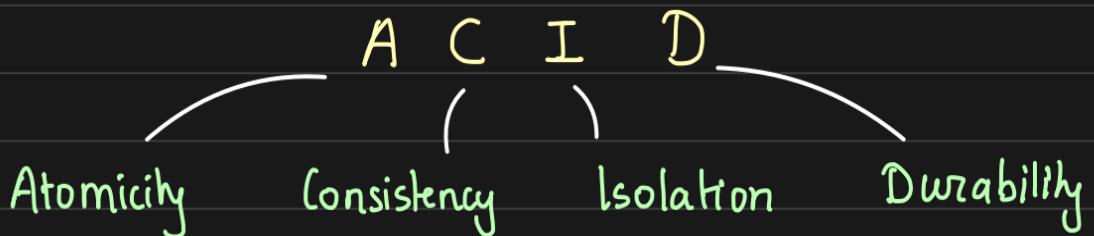
Computers first did "accounting" → ledgers → Rows & Columns

Databases were developed to support accounting

Hence, key properties were

- 1. Data consistency
- 2. Data durability
- 3. Data integrity
- 4. Constraints
- 5. Everything in one place

Because of these reasons, relational databases provides "Transactions"!



Atomicity All statements within a transaction takes effect or none

eg: start transaction

publish a post
and increase
total posts count }
insert into posts values (....);
update stats set total-posts = total-posts + 1
where user-id = 100;
Commit

Consistency

data will never go incorrect, no matter what
constraints, cascades, triggers

eg: foreign key checks do not allow you to delete
parent if child exists ↗

* can be tuned

You have the necessary tools

to ensure that your data never goes inconsistent

total-posts = total entries in posts table for user!

Durability

when transaction commits, the changes survives outage.

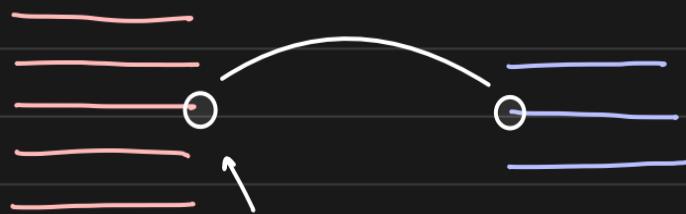
Isolation

When multiple transactions are executing parallelly,

The isolation level determines how much changes

of one transaction are visible to other

Txn 1



Txn 2

should changes done at
this line in Txn 1 be visible to Txn 2
before Txn 1 commits?

Remember

You pick relational databases for relations and acid.

Exercise

1. Setup a SQL database (MySQL or PostgreSQL)

2. Create a schema for a social network

users, posts, profile, photos, following ↗ define
etc. relationship

3. insert data in (users & profile) in one transaction