#ASLI ENGINEERING

Relational Databases

SWIPE

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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!

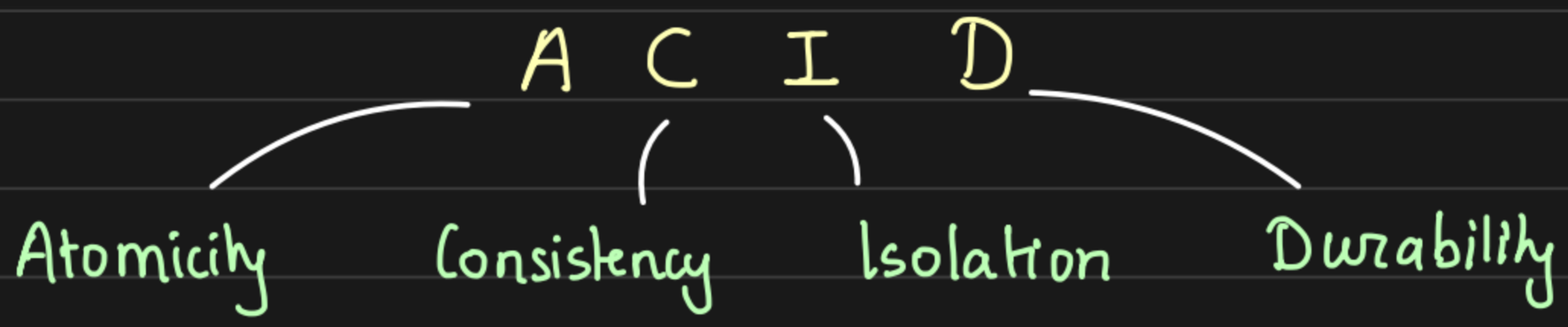
Computers first did "accounting" → ledgers → Rows & Columns

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

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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

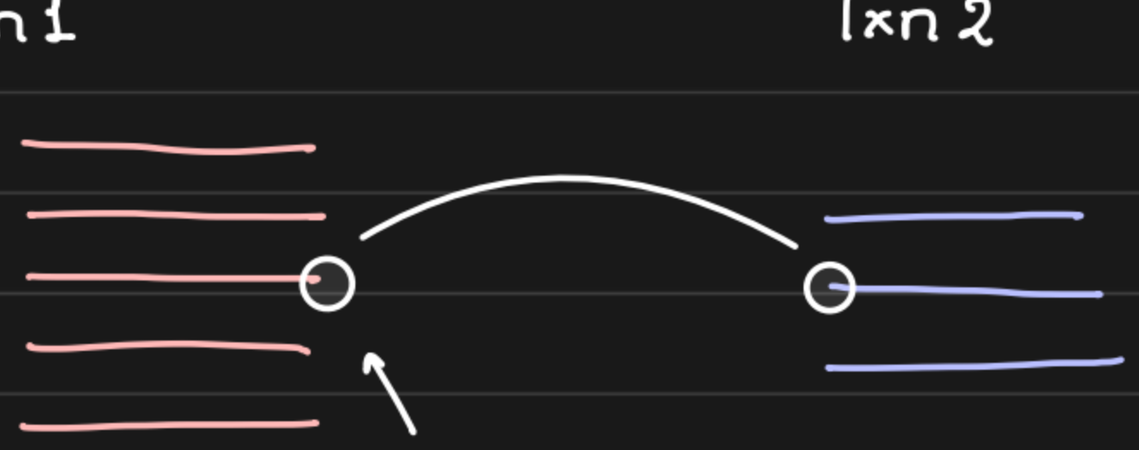
total_posts = total entries in posts table for user!

Durability

when transaction commits, the changes outlives outage.

Isolation

When multiple transactions are executing parallely,
the isolation level determines how much changes
of one transaction are visible to other



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 etc. → define relationship

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