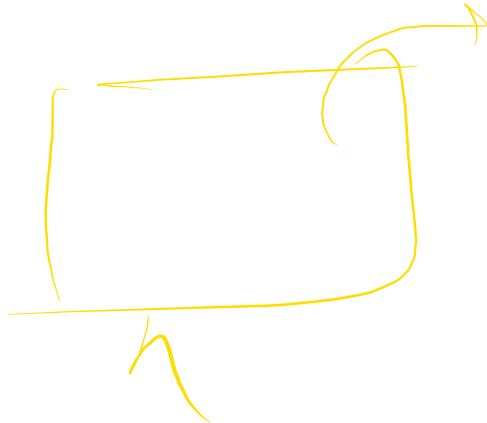


Data storage]



file based storage system :-



D drive

G files

G file hot

FFF

1950's

Challenges ?

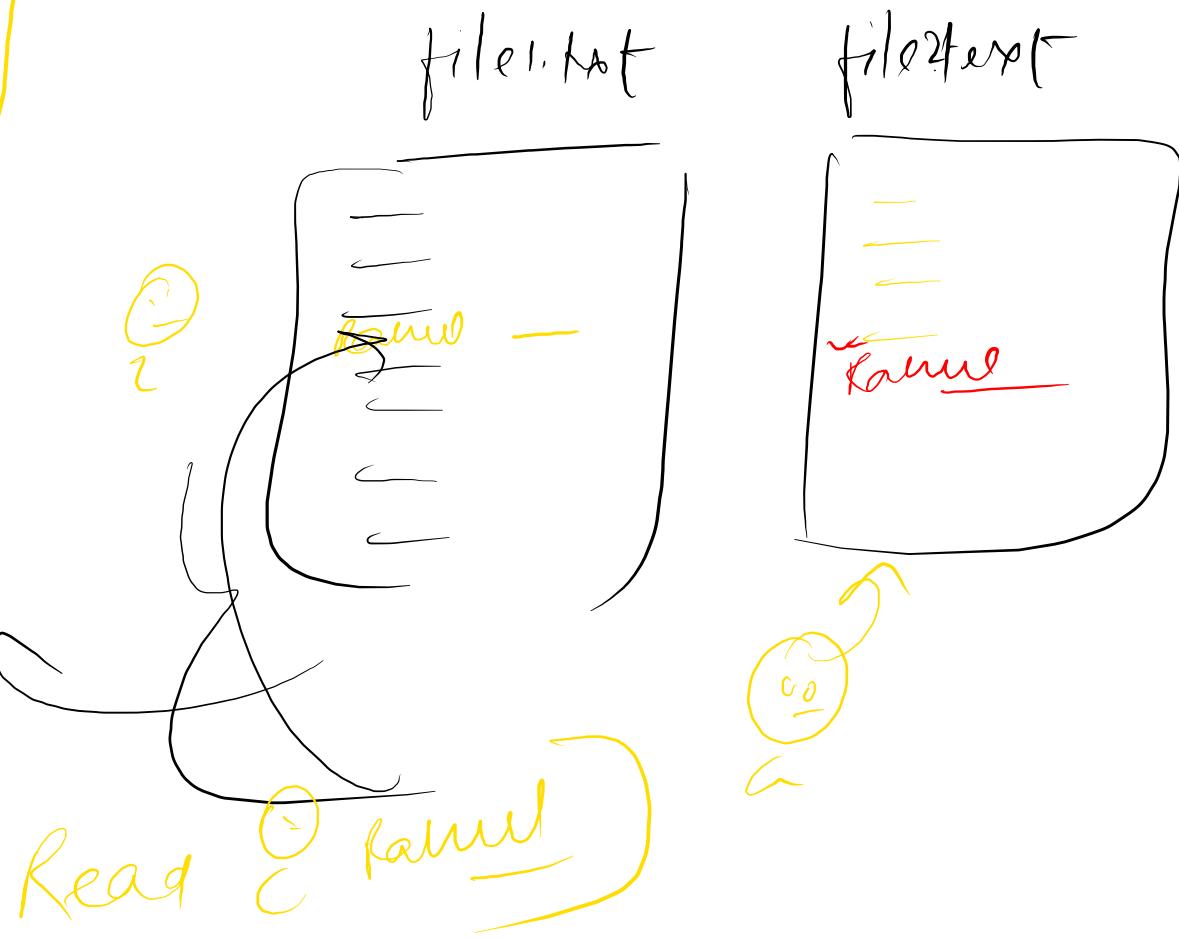
①

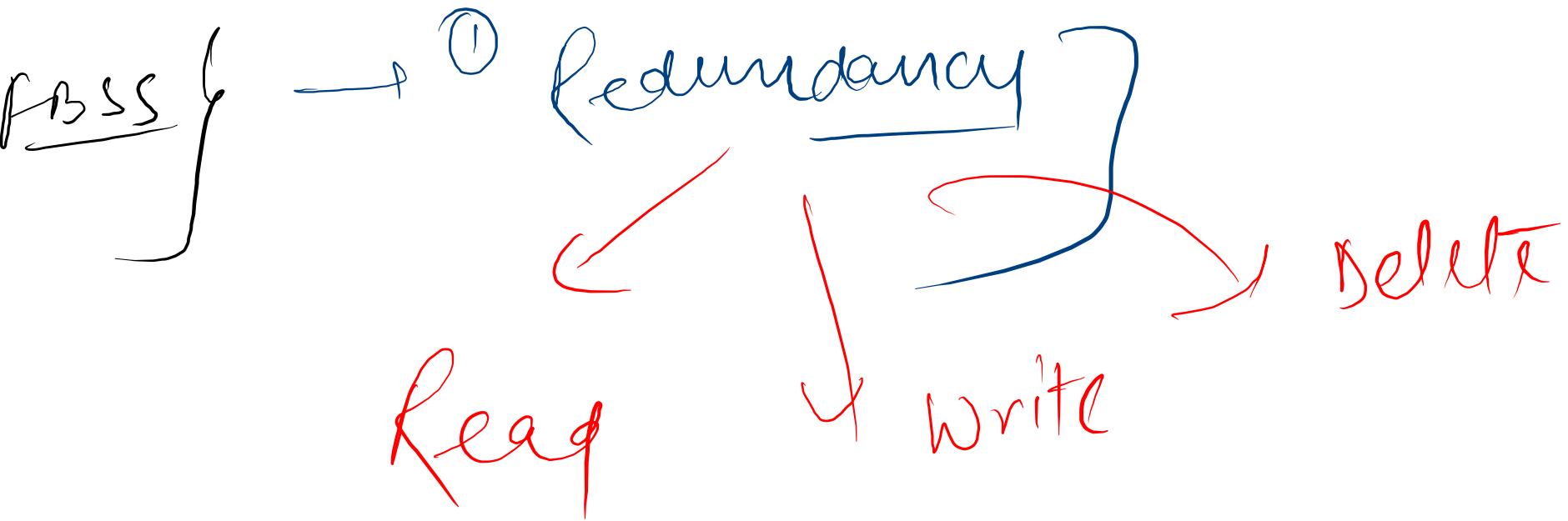
C
R
W
S

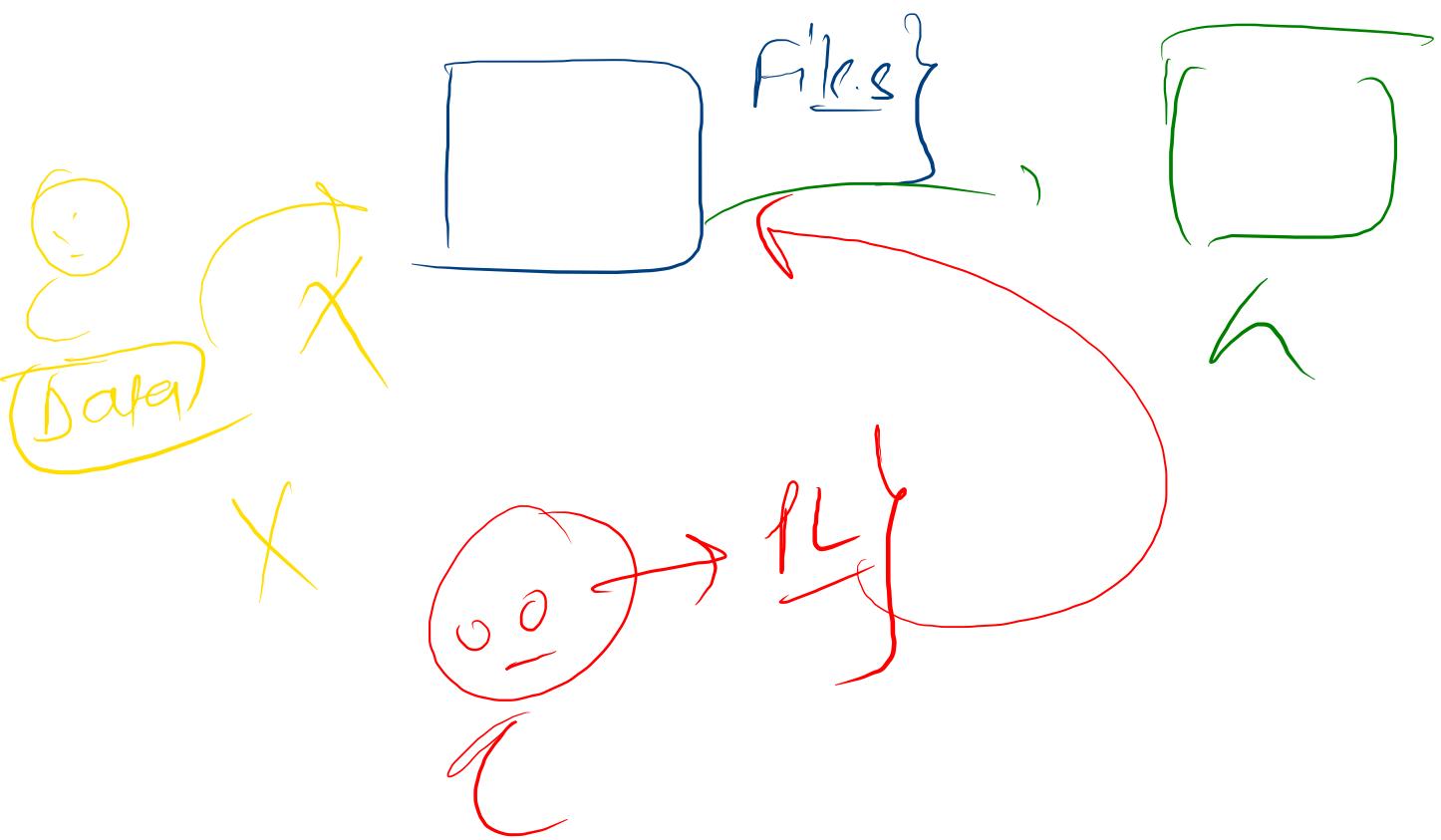
↳ anomaly

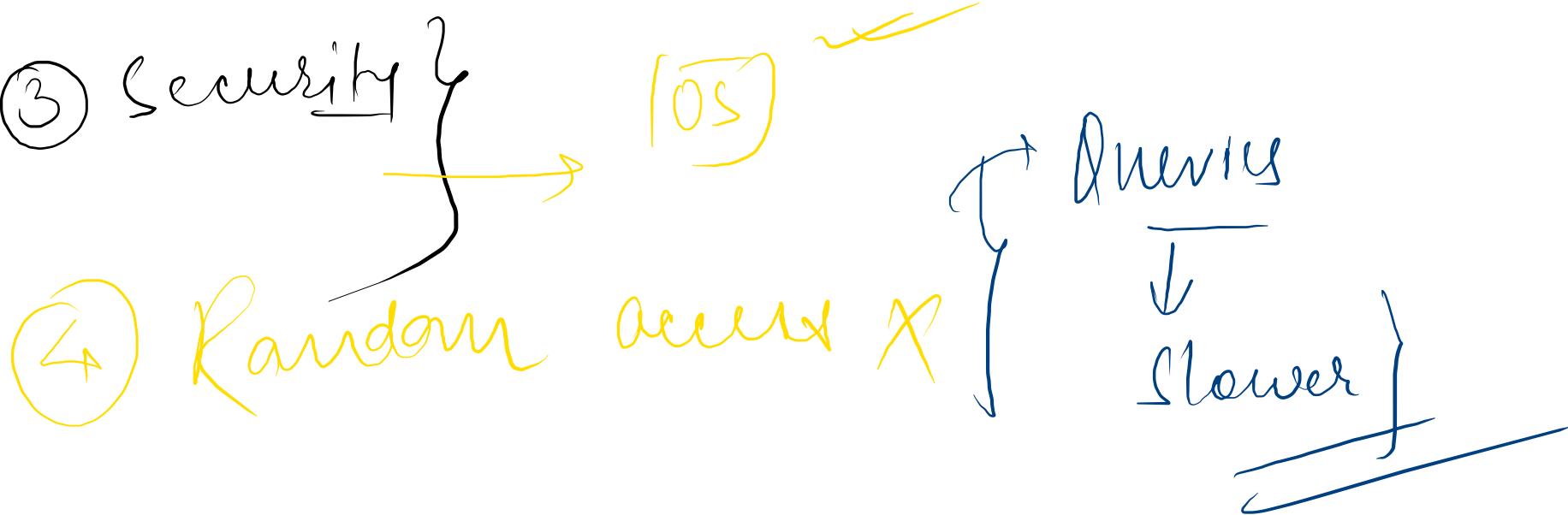
↳ Duplicate Data

↳ Redundancy

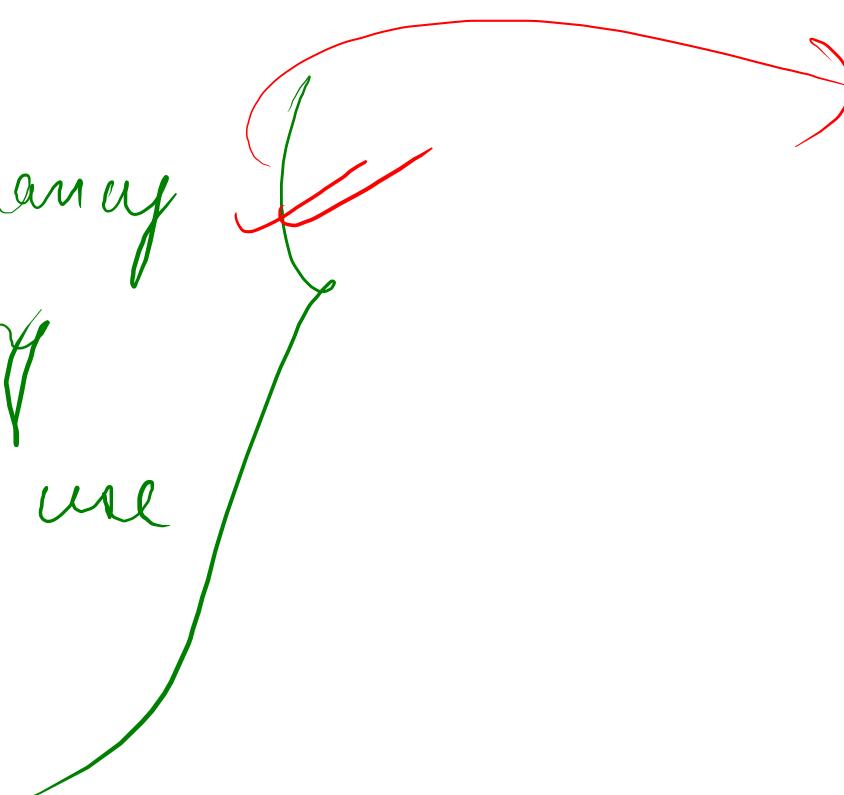






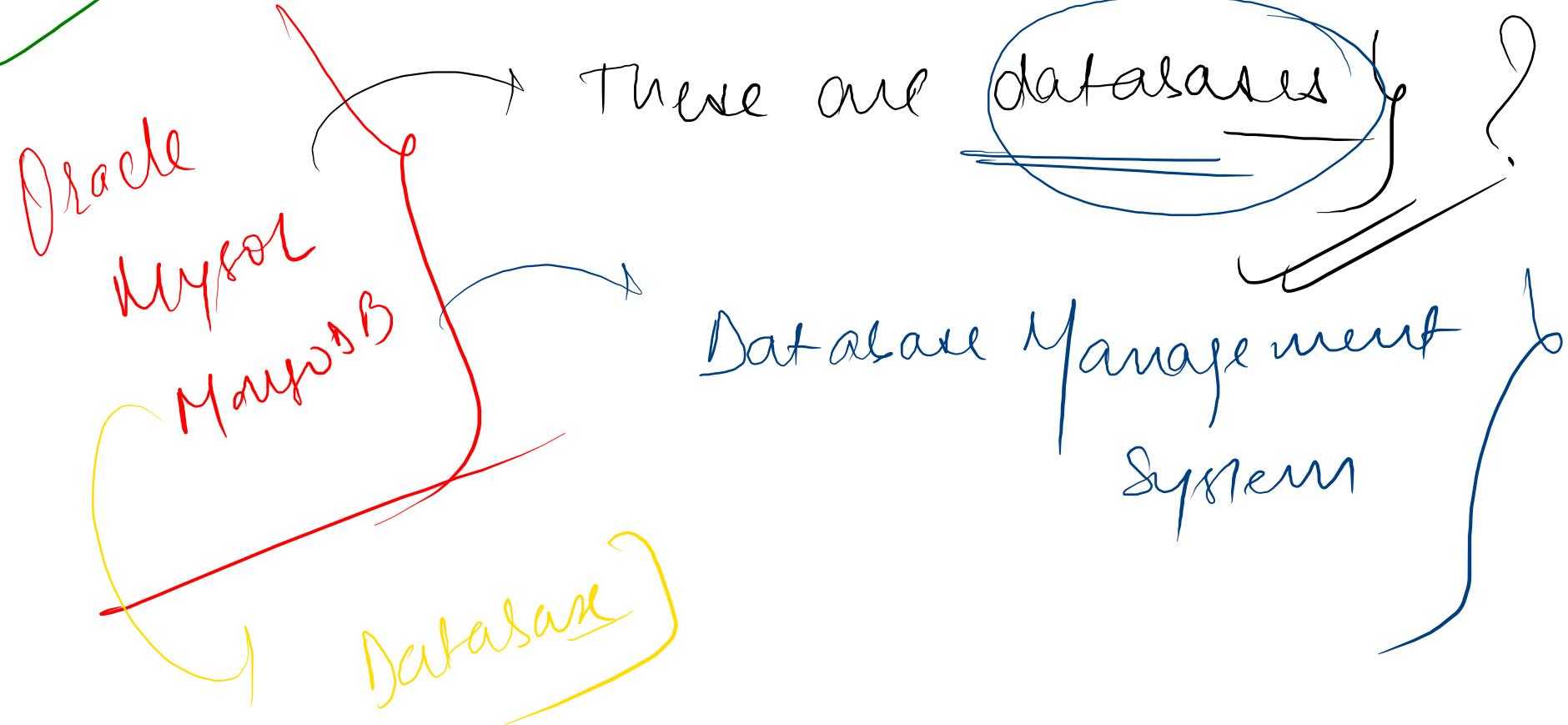


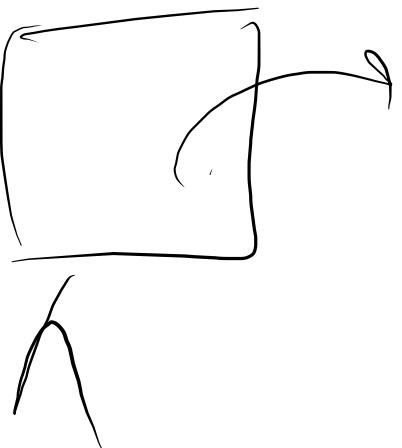
Teeth } Pass }
 |
 G Redundancy
 |
 security
 |
 ease of use



DBMS

Database Management System

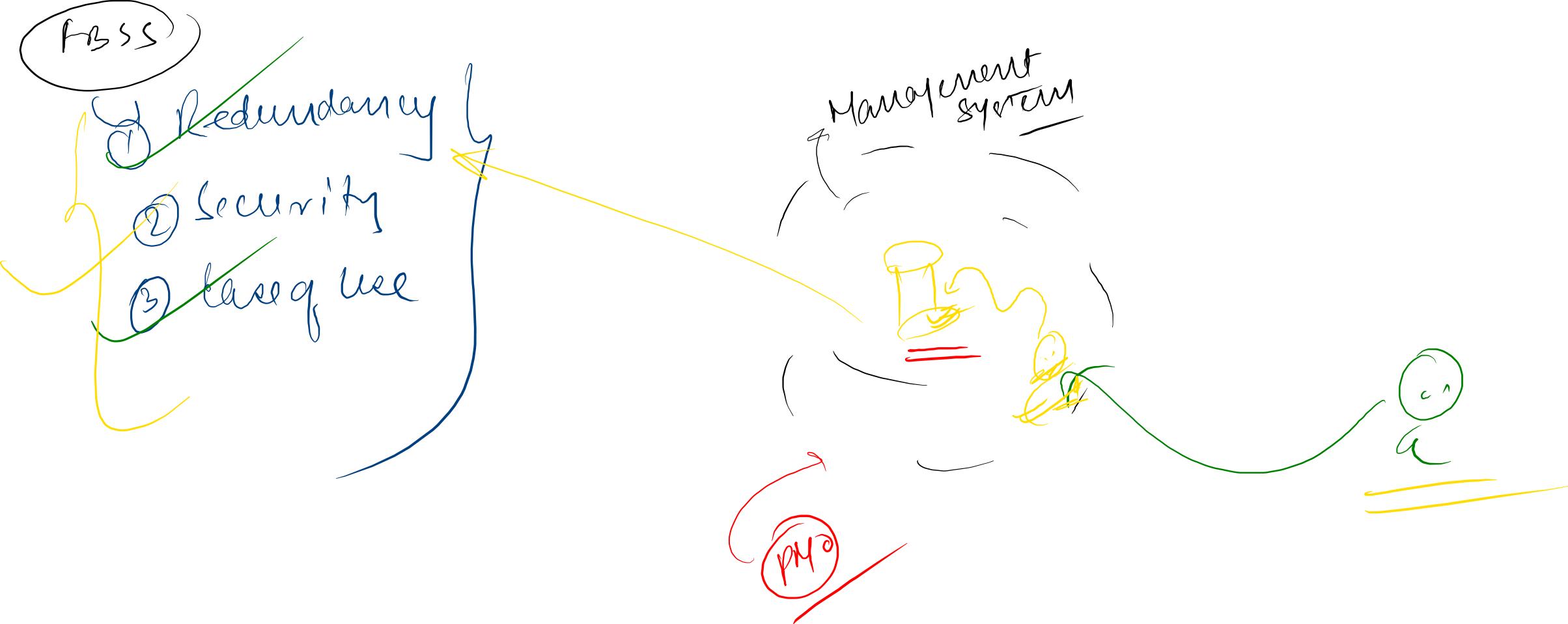




Servers X



ABSS

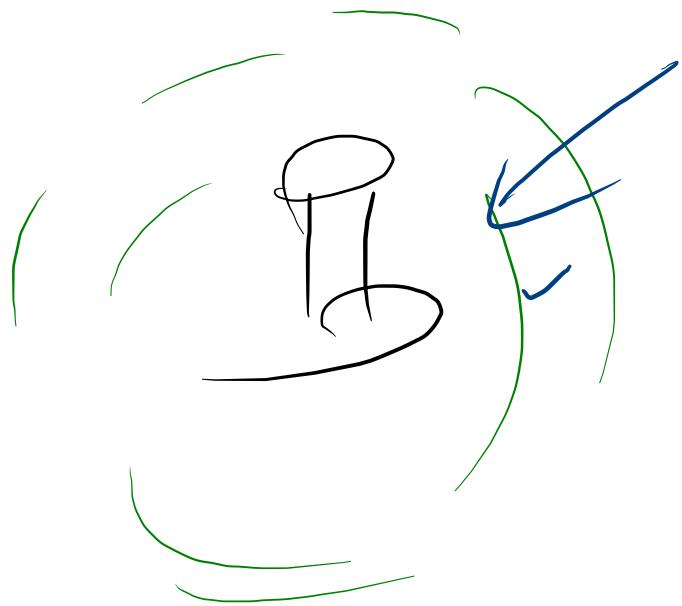




Declarative nature



CRUD



Authenticational /
Authorisational

Security ↑

FBS → DBMS

2000's

2000's

Duh, boy

Bb

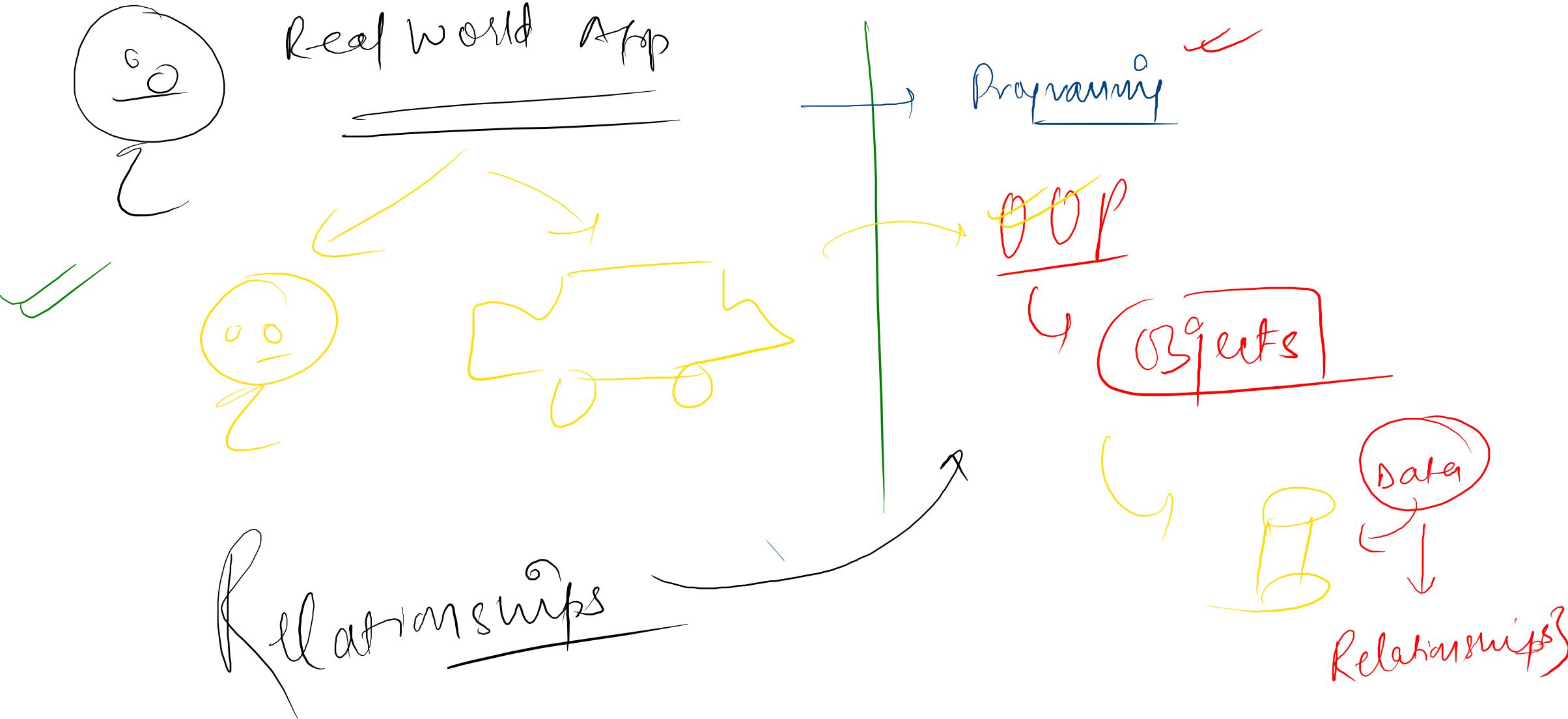
Amazon

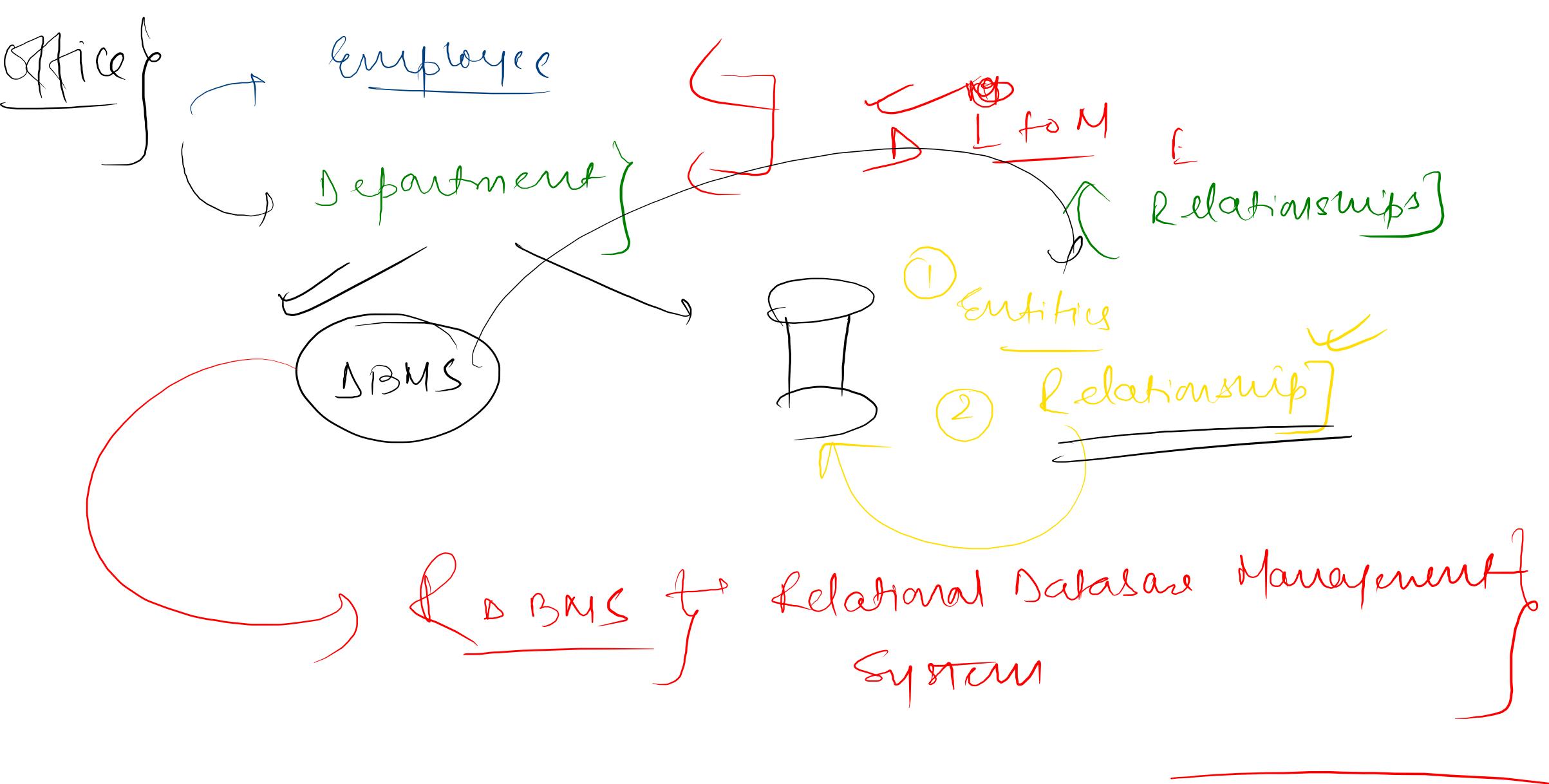
Facebook

Funder

Malice

Funder





RDBMS } → MySQL {
 |
 Oracle }

Day 1

System design

ALD → LLD

↓
Back of envelop calculation

Day 2

Distributed System

↳ Redundancy / Replication

↓
Consistency

CAP
△ usage

Day 3

Architecture

Mashup

→ SOA

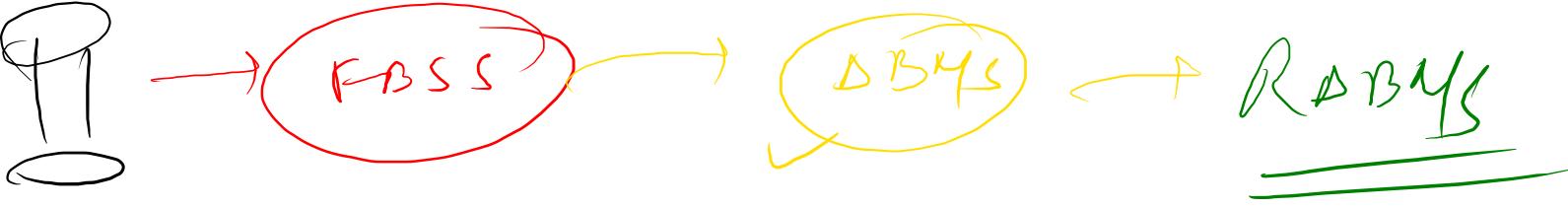
↳ Microservices

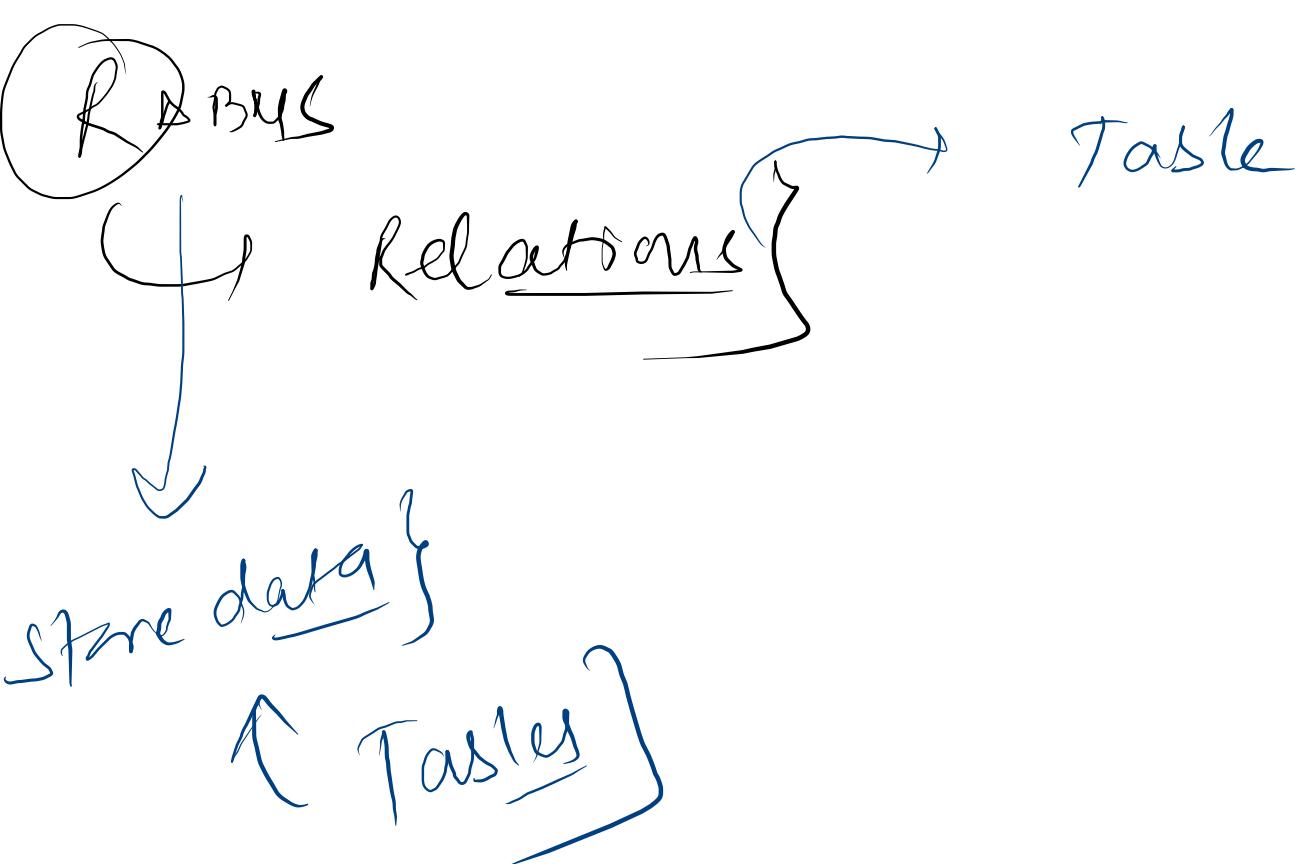
Throughput

Latency

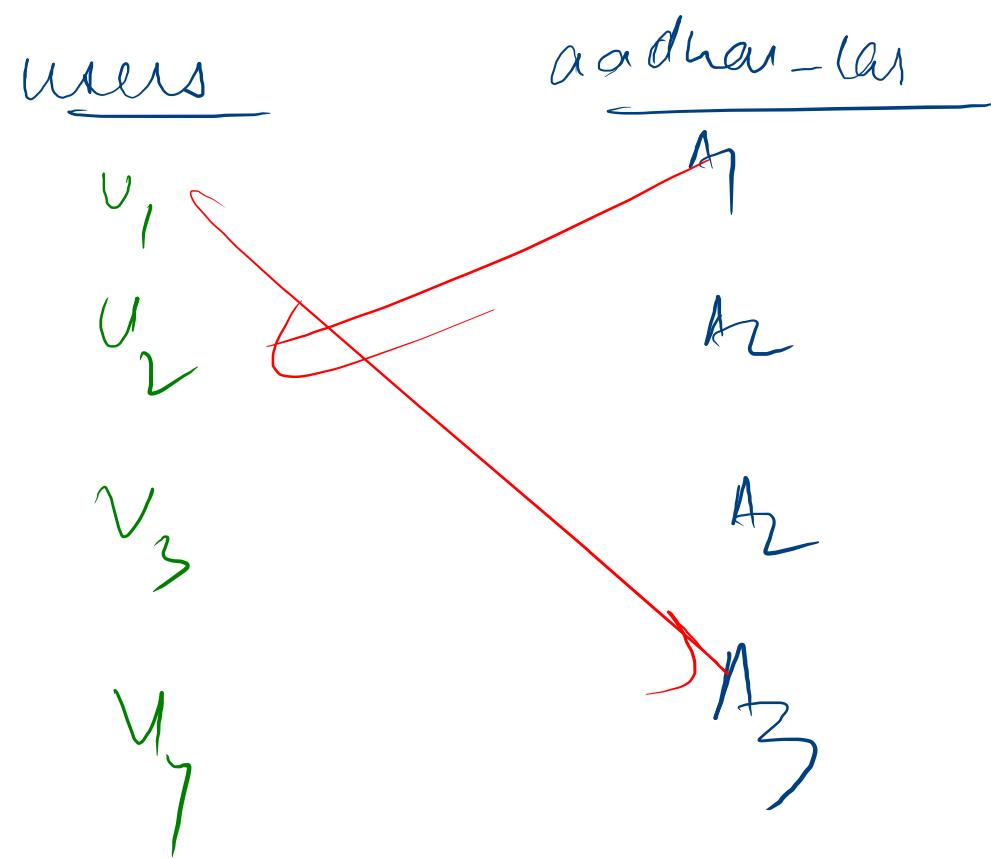
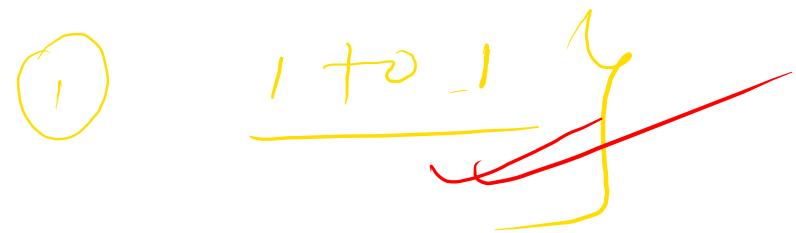
Client
Server

CB → Load Balancing





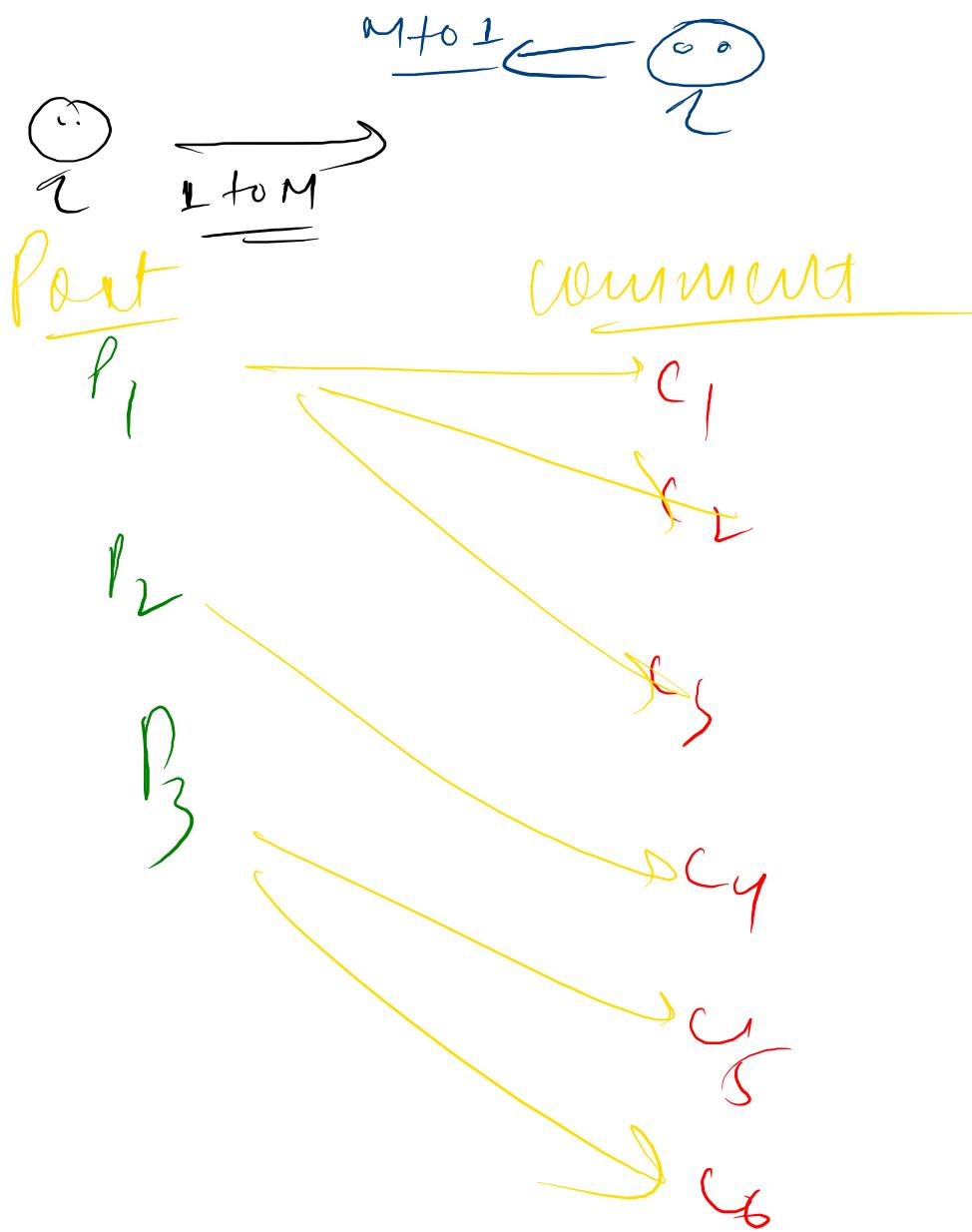
Relationships



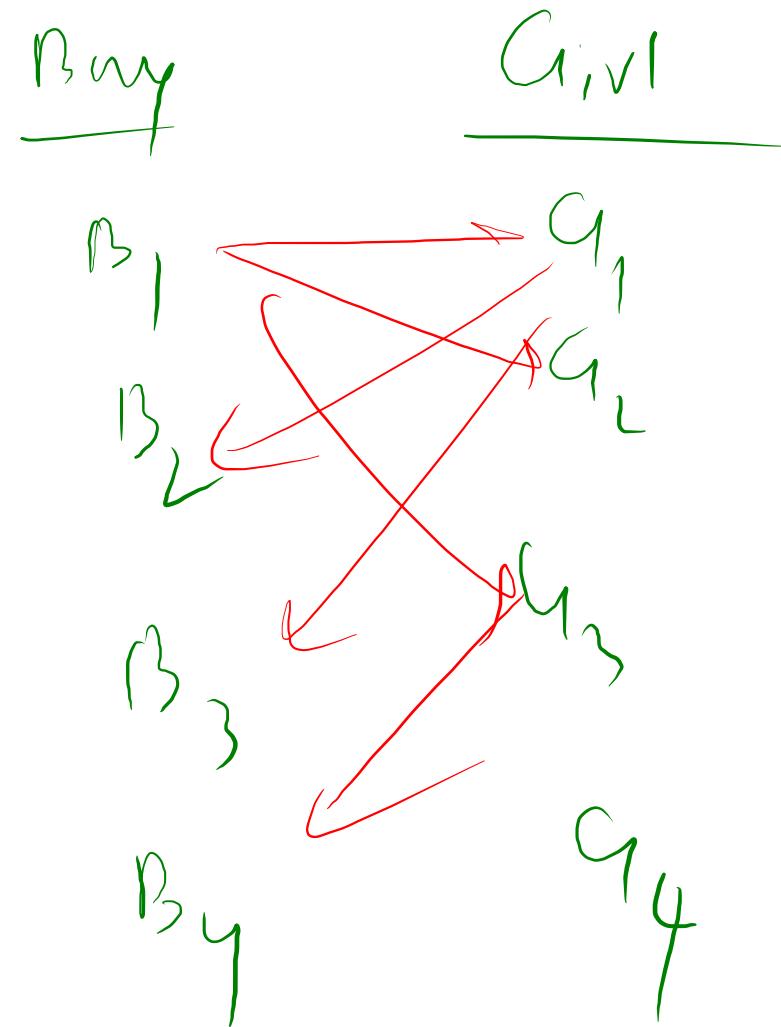
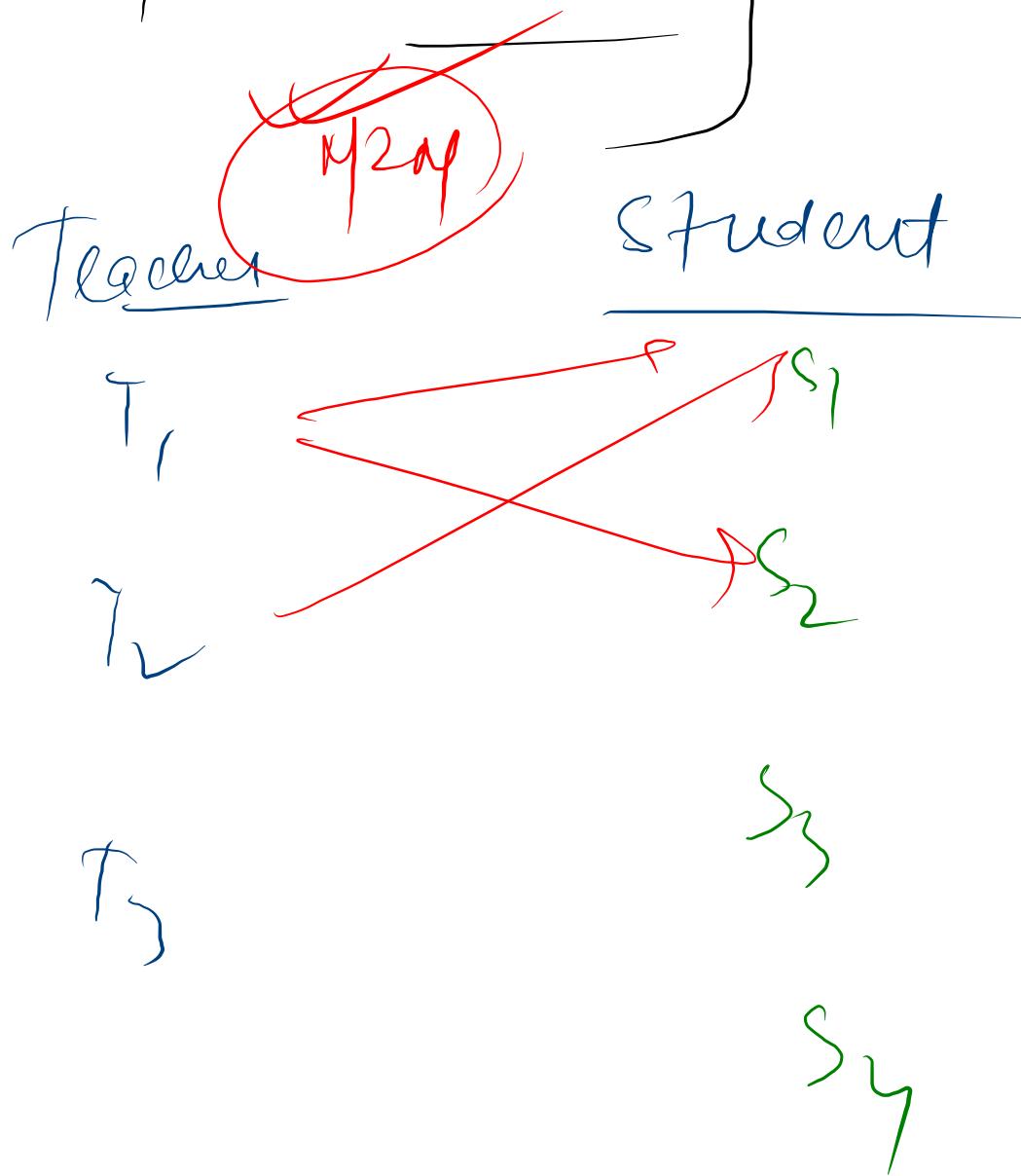
② 1 to Many relationships

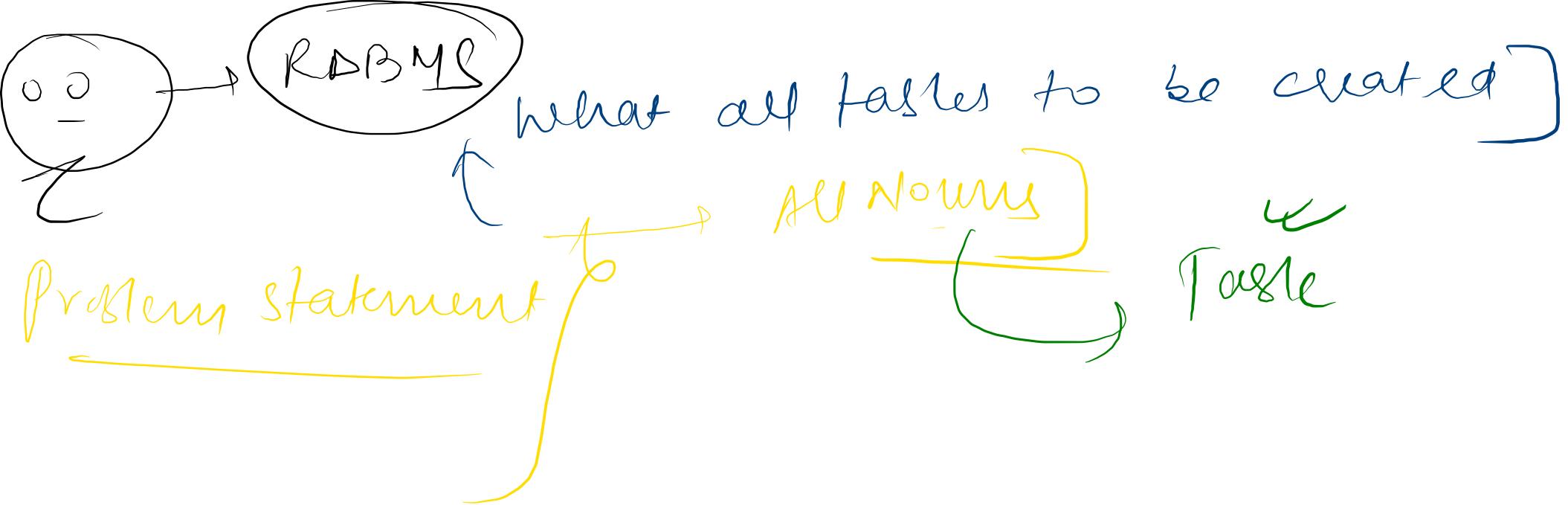
~~mirror images of each other~~

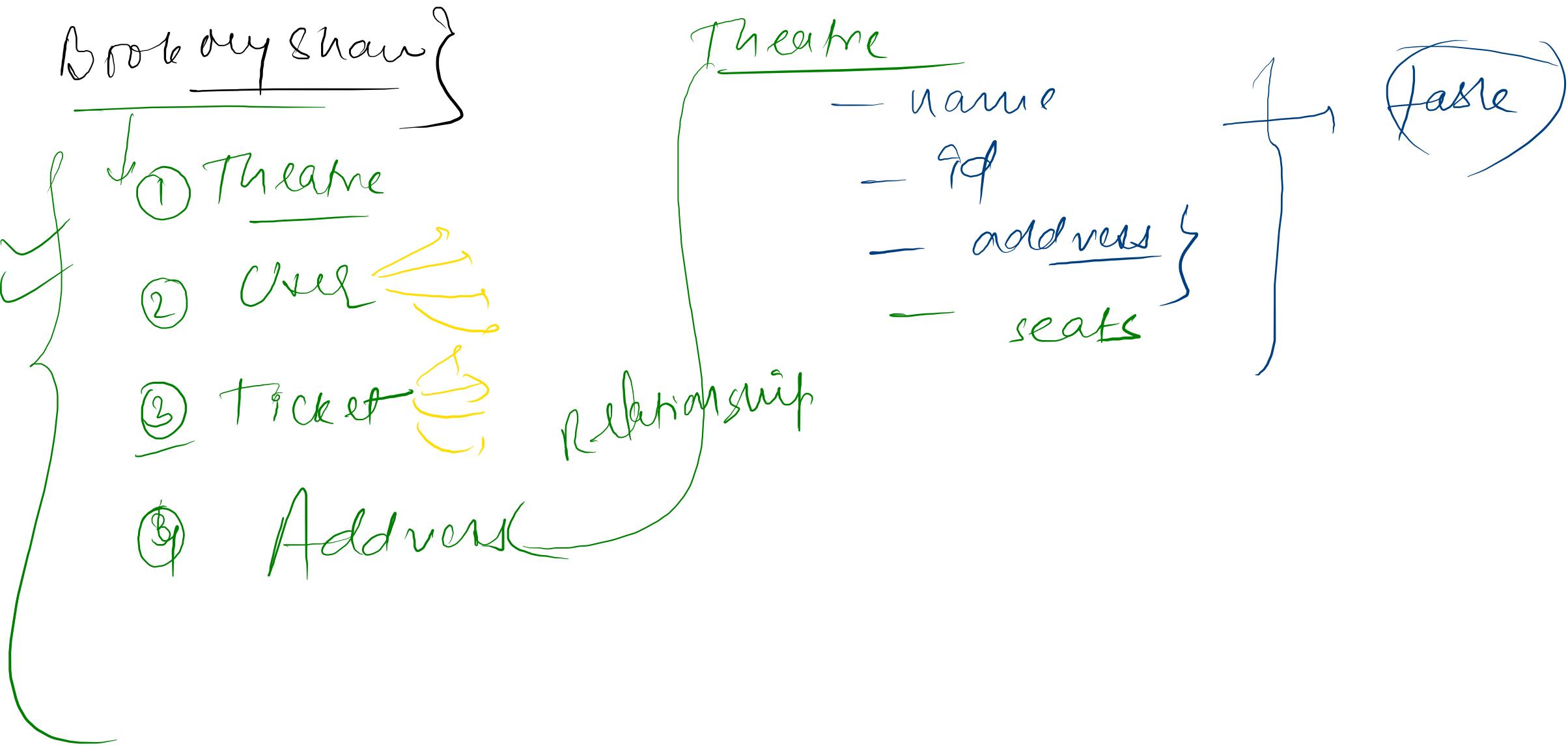
Many to 1 relation

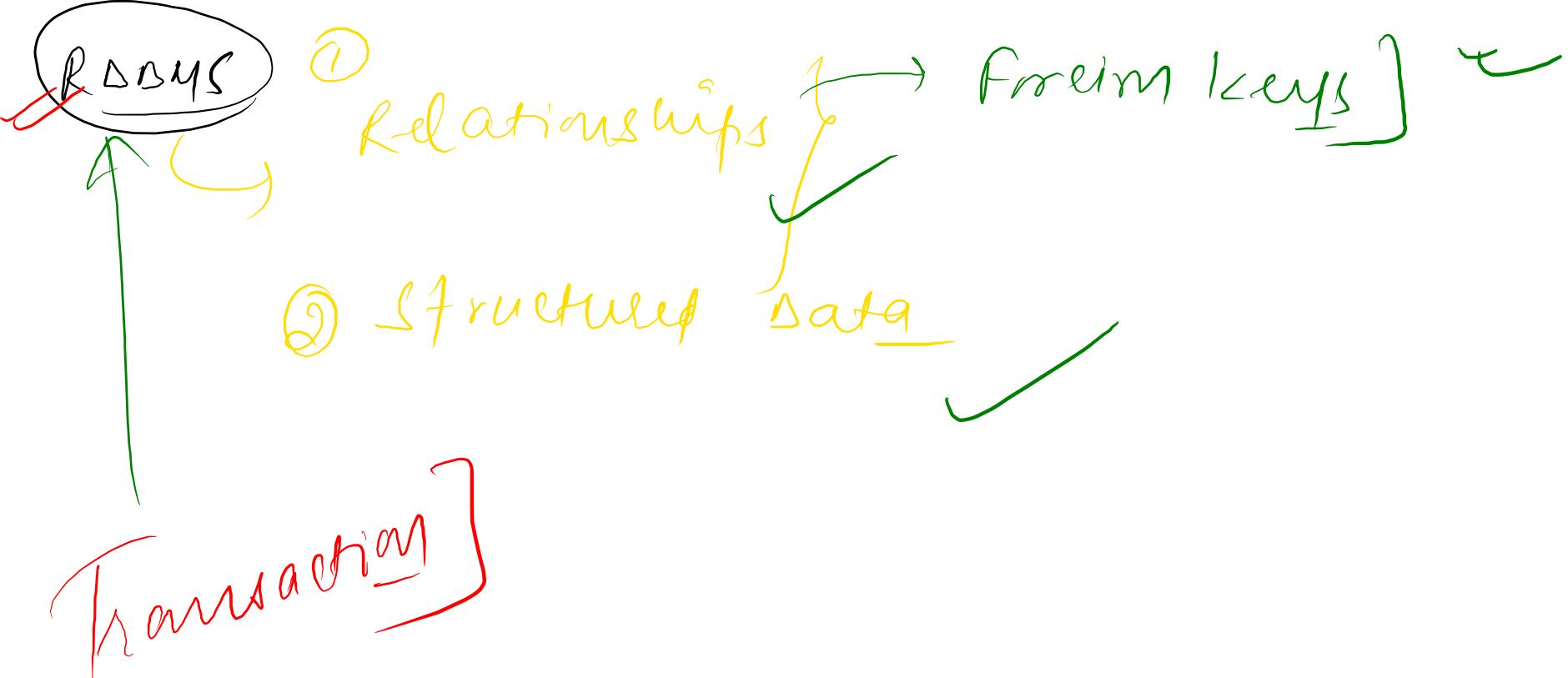


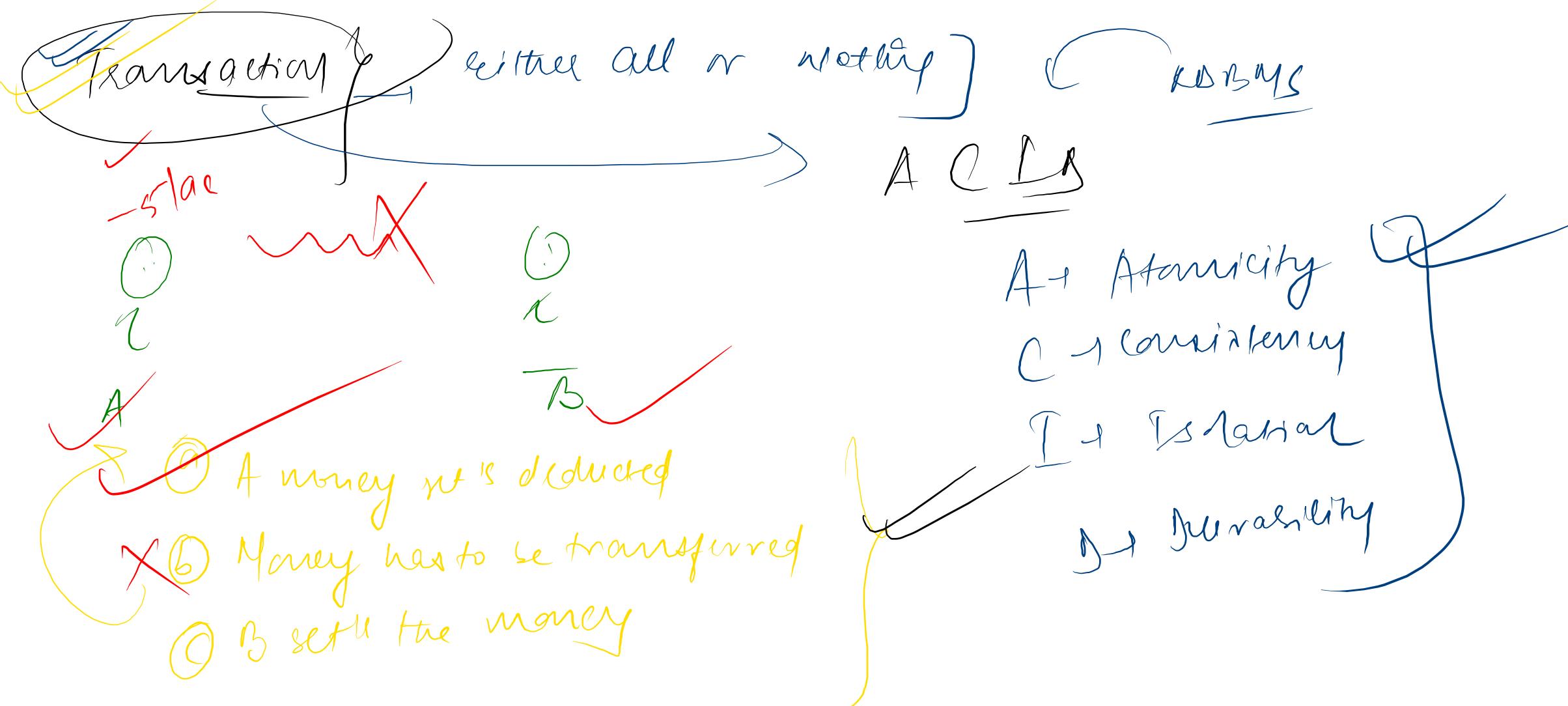
③ M to M relationship $\xrightarrow{\text{Tinder}}$

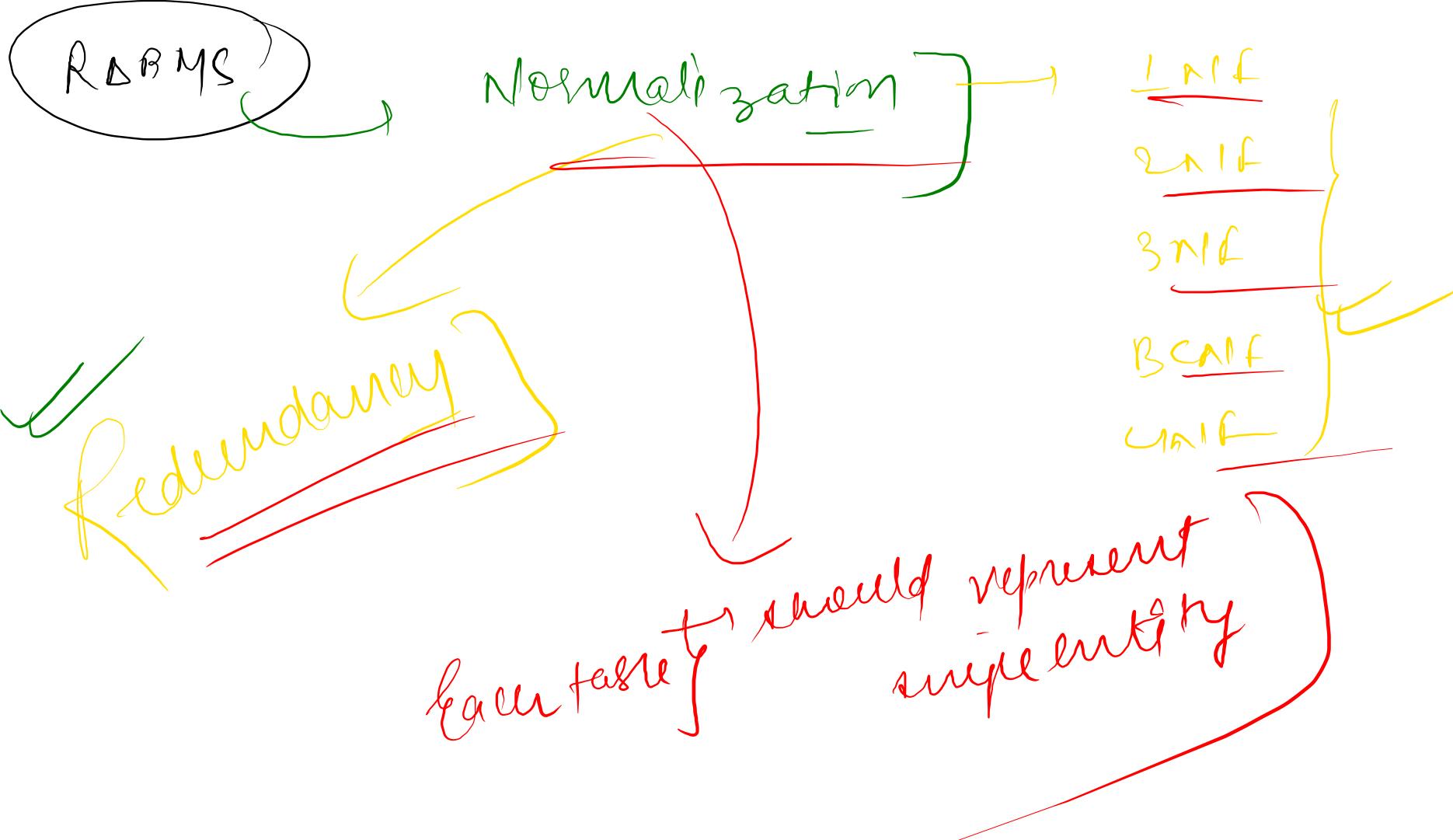


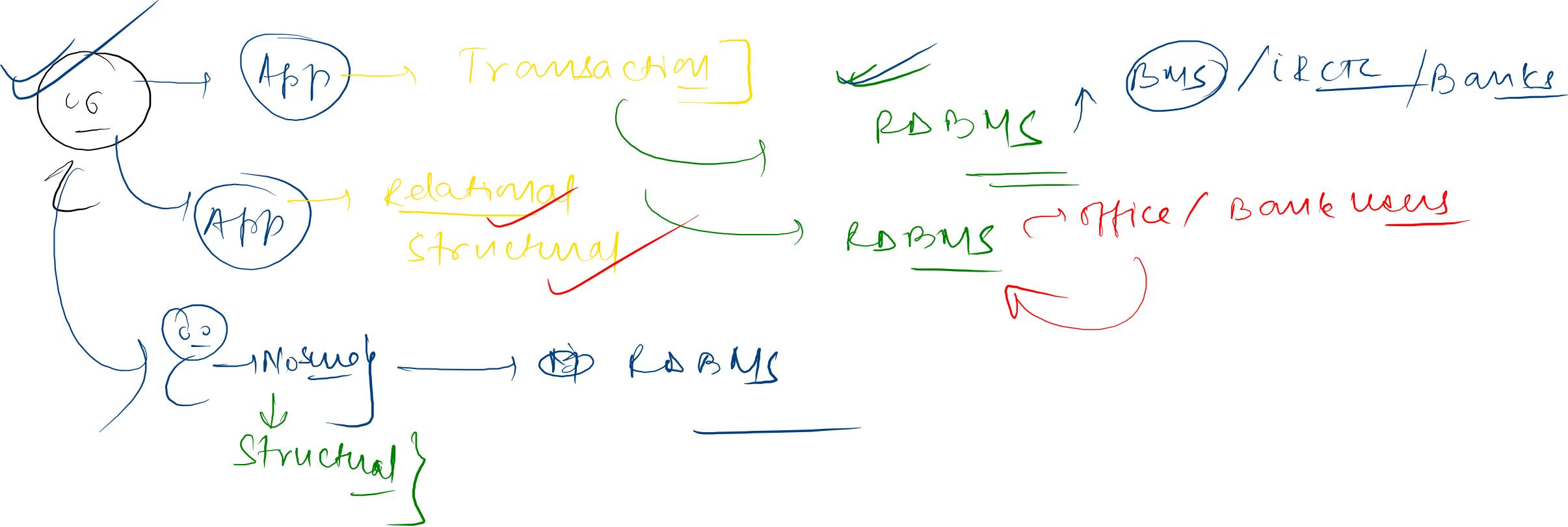


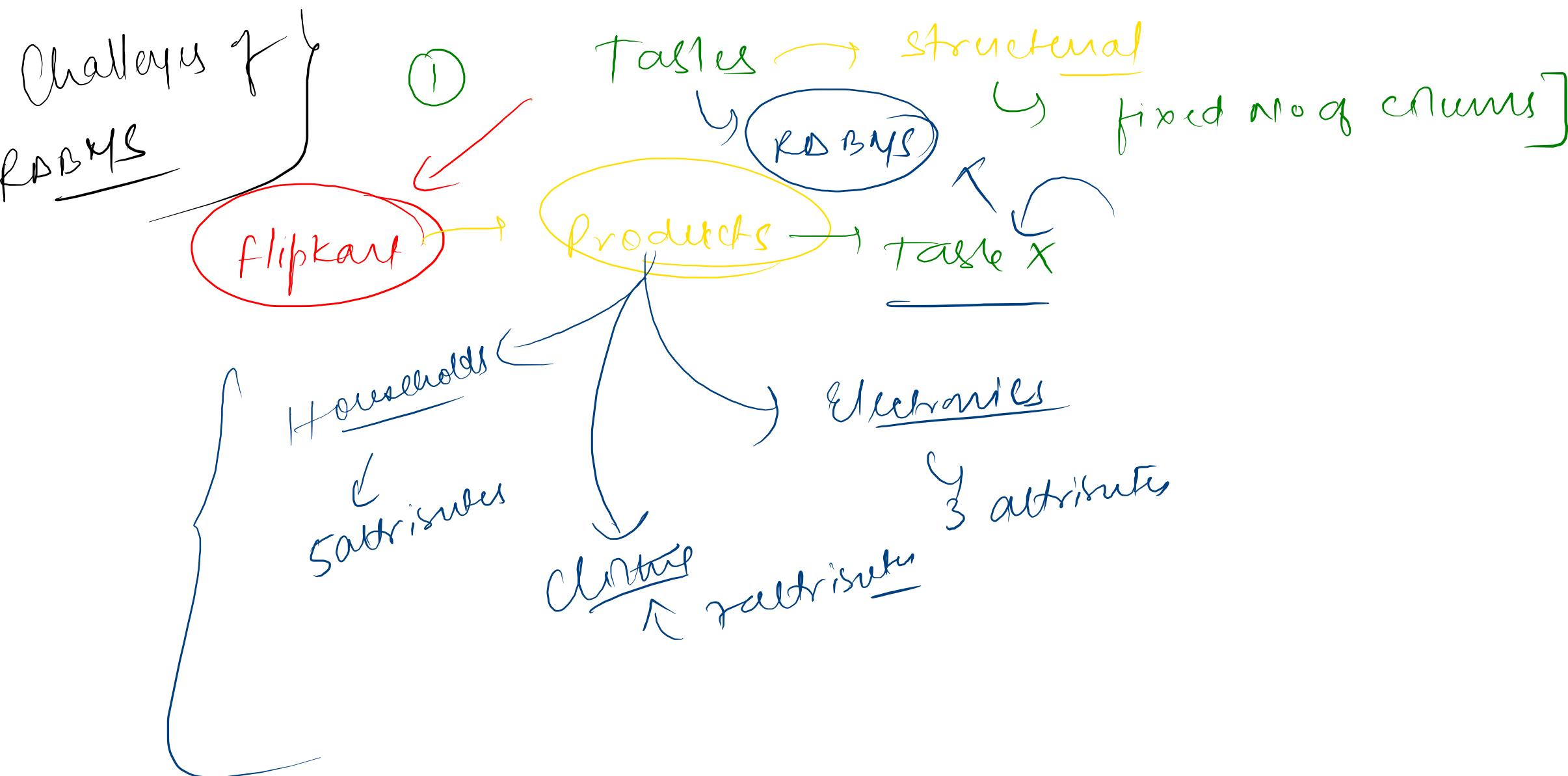






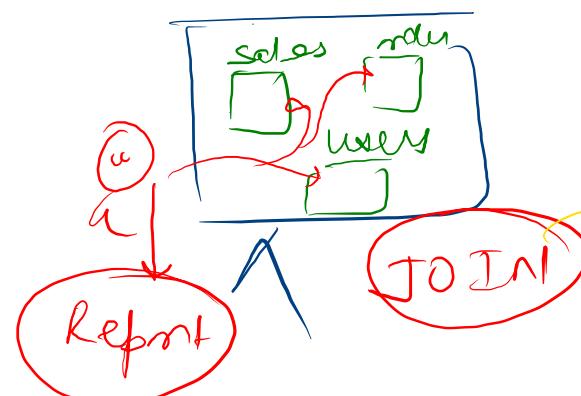






②

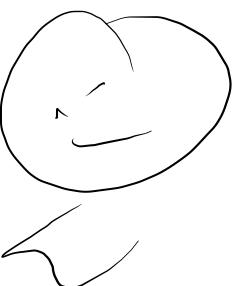
RDBMS



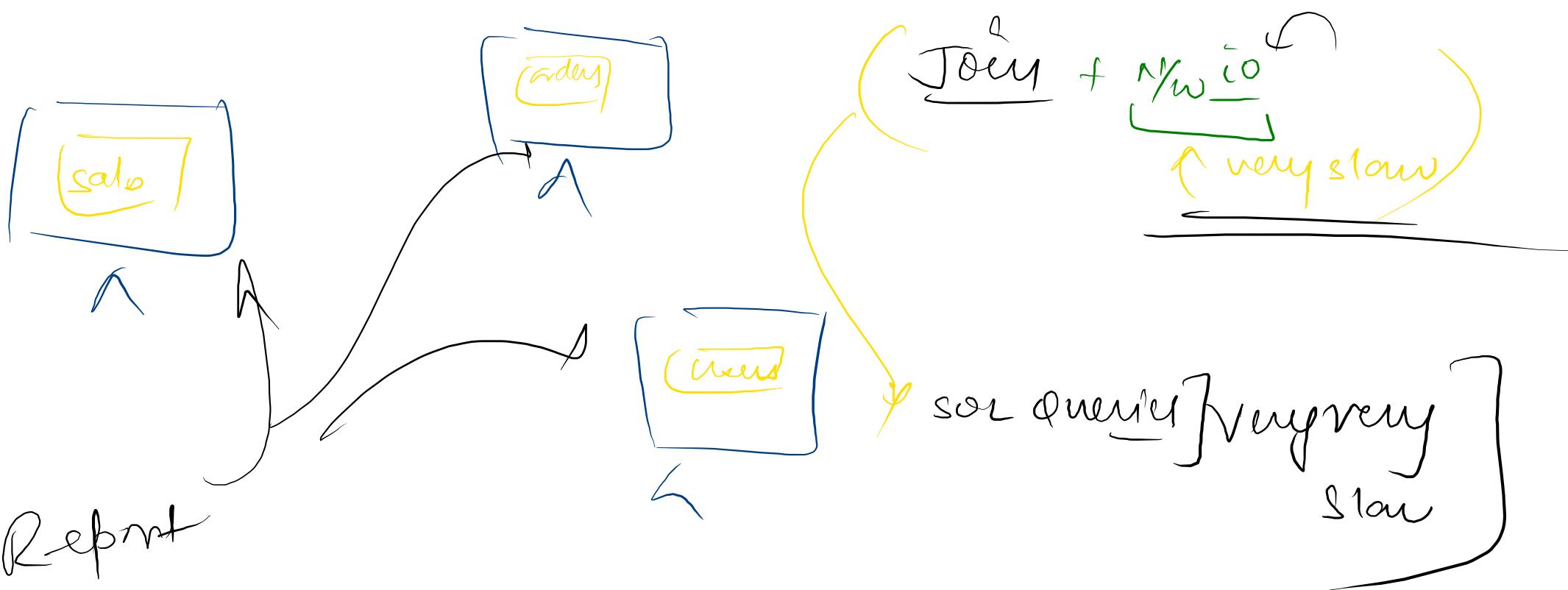
eComm

[expensive operation / time consuming]

→ 24 hours | People 25-30 years
↑ sales / order volume



Report

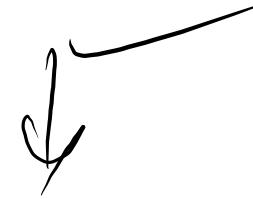


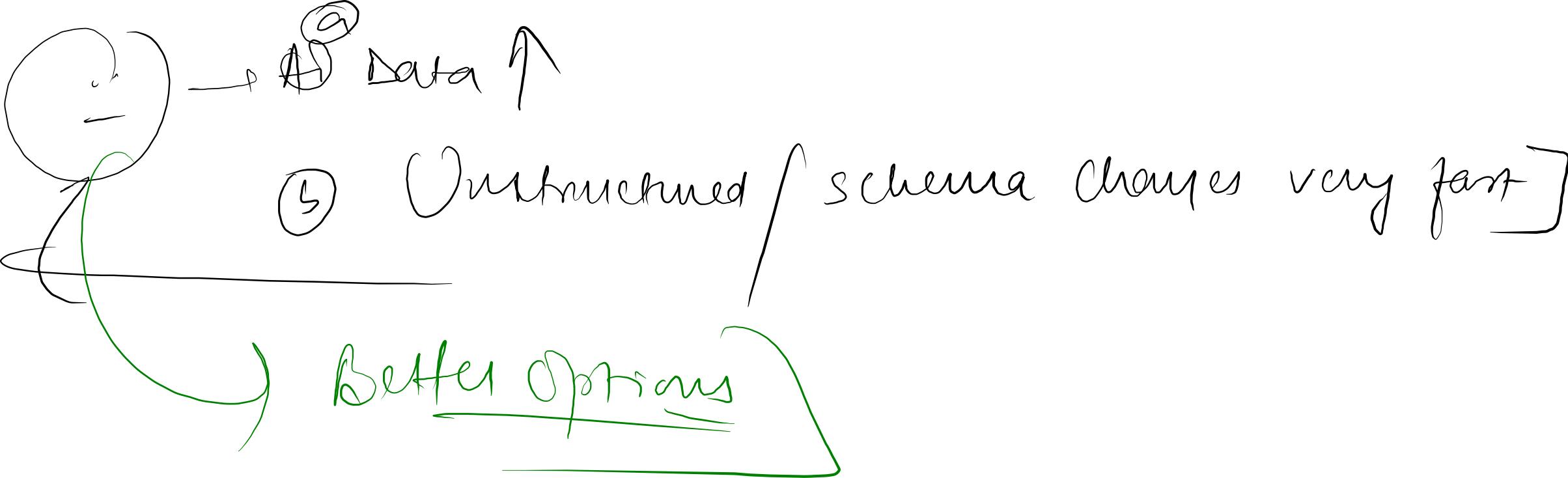
RDBMS

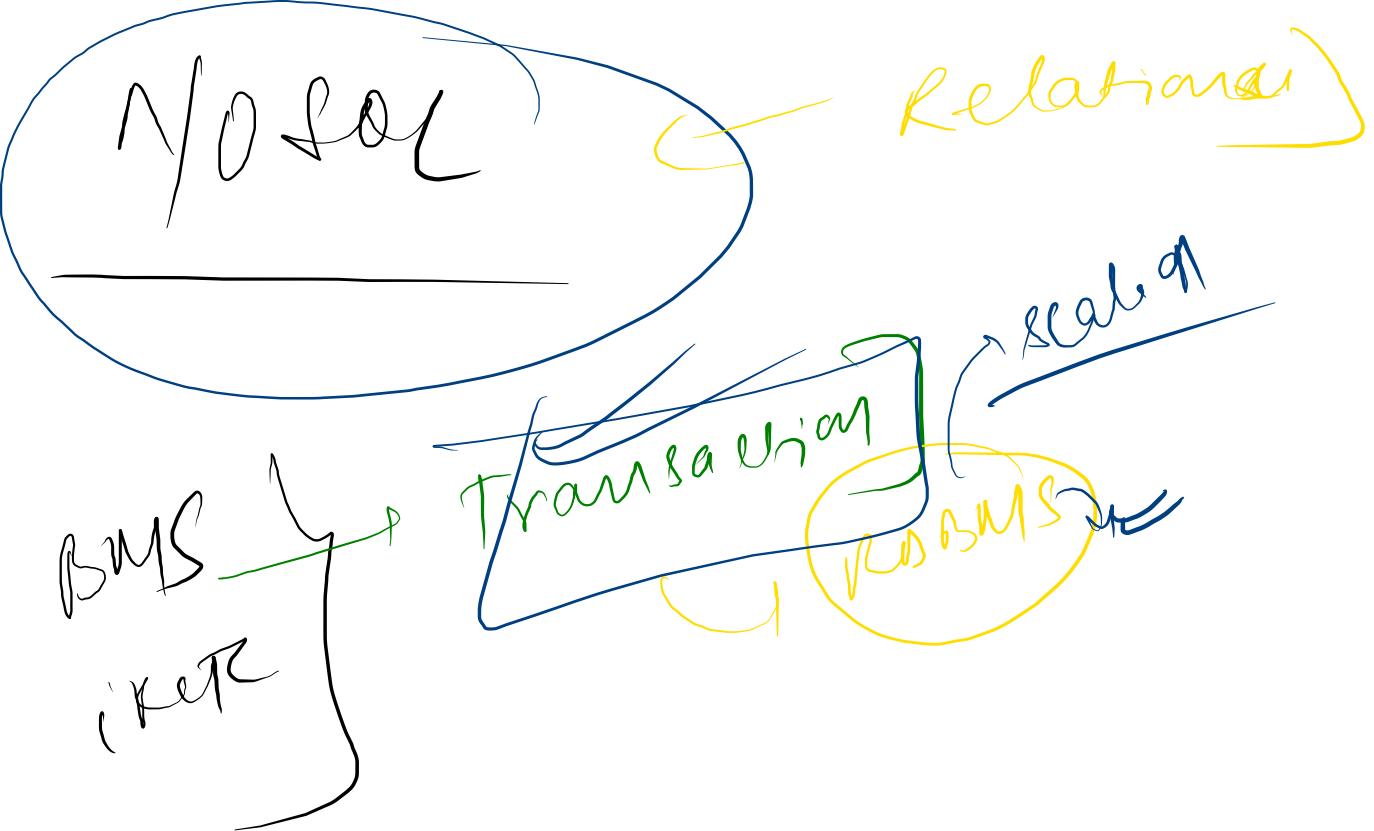
[scale]

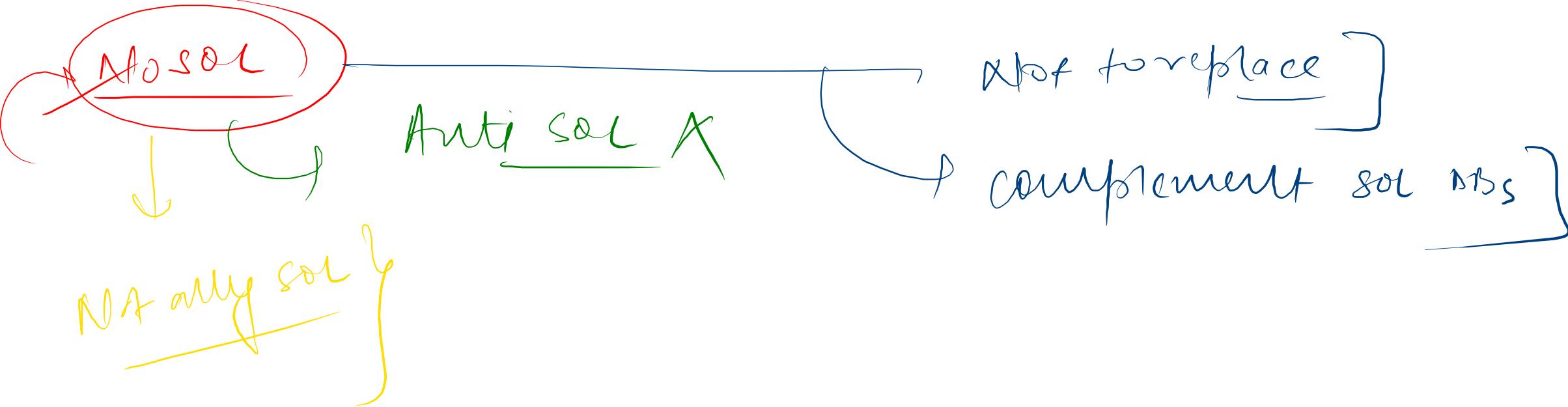


query speed









8:07

8:12 PM

NOOL

DB Optimizations

Breaktime

NOSQL

BASE

RABBIT

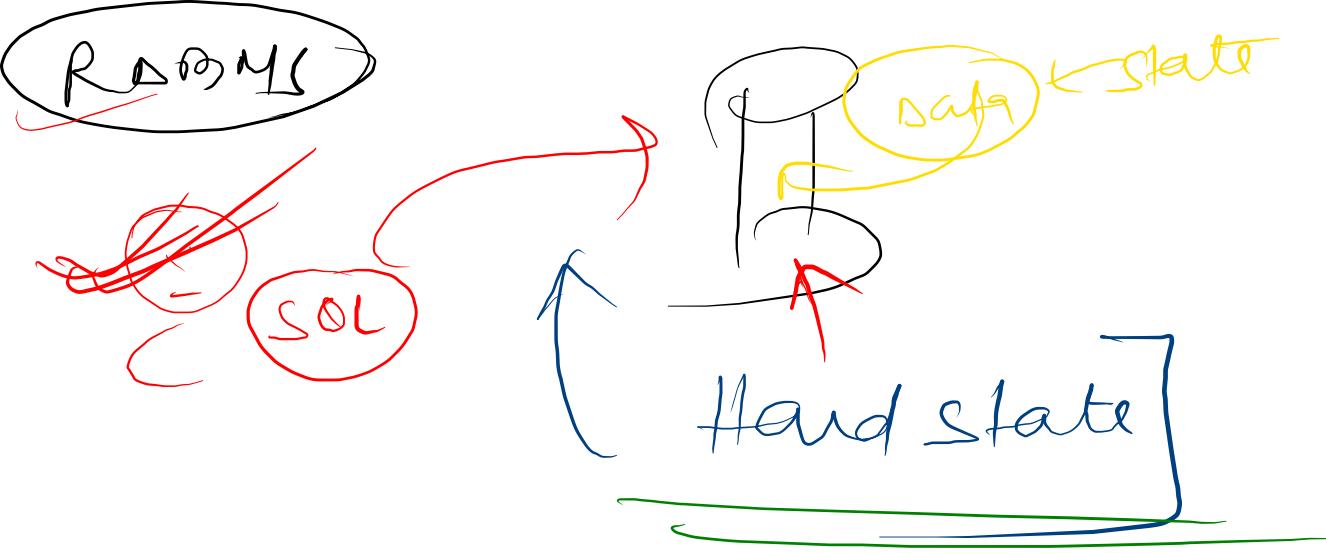
ACID

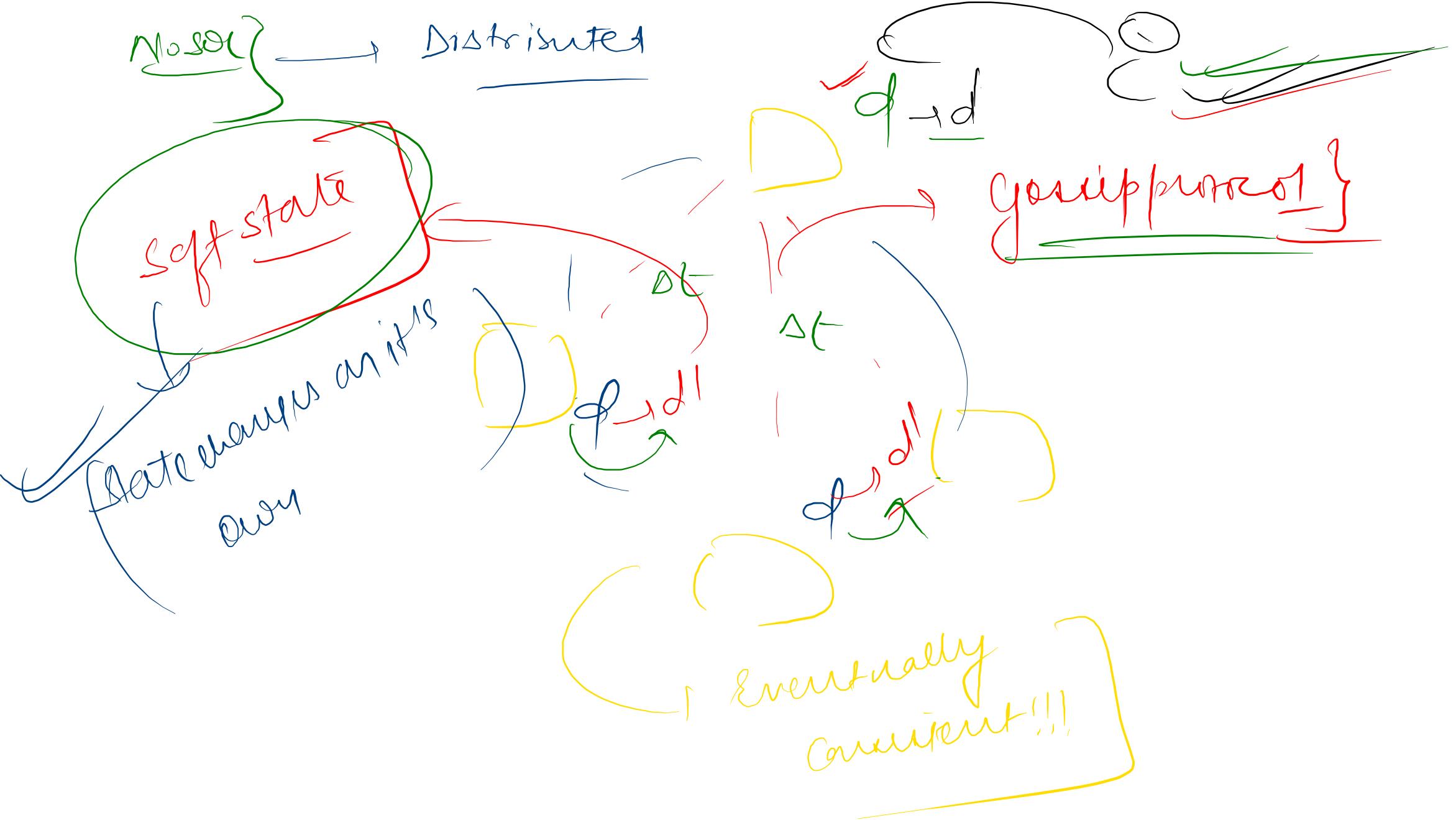
① Basically available

② Soft state

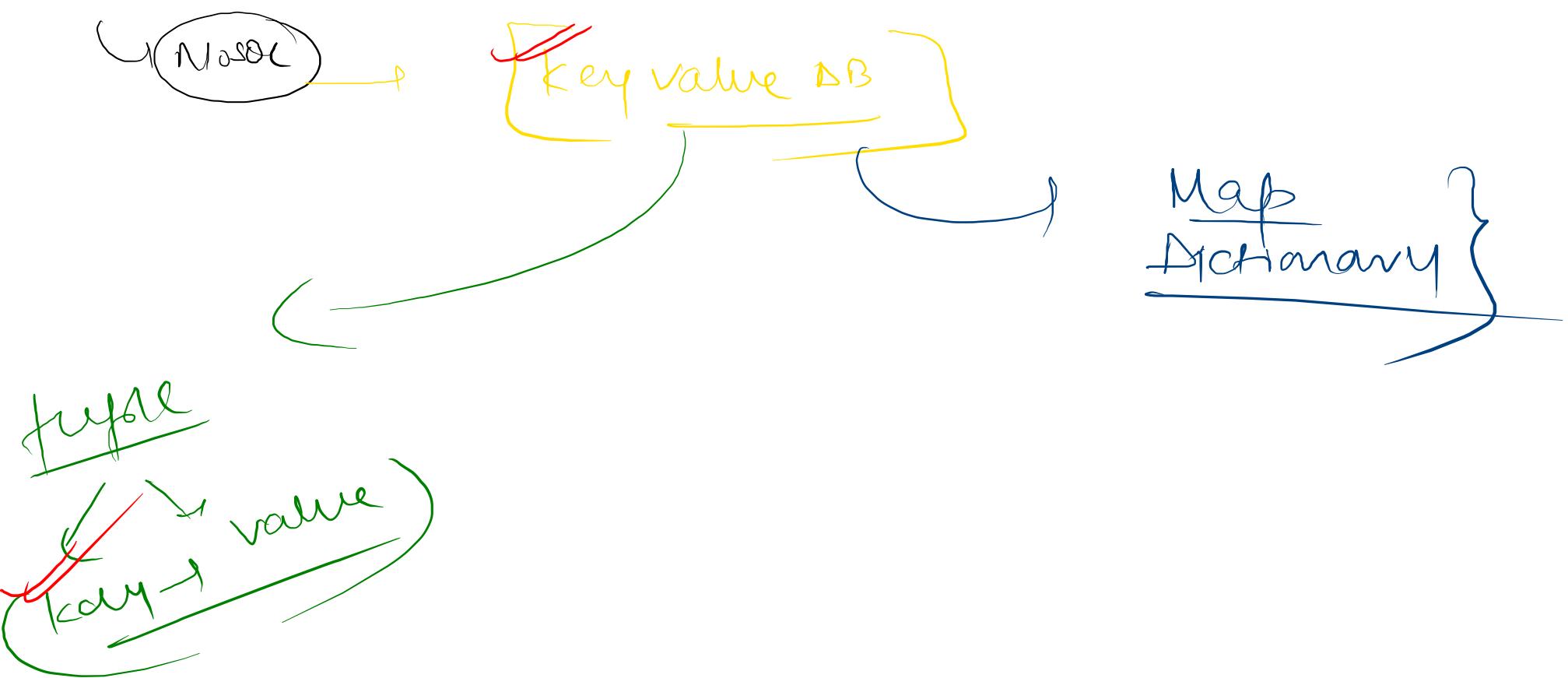
③ Eventually consistent

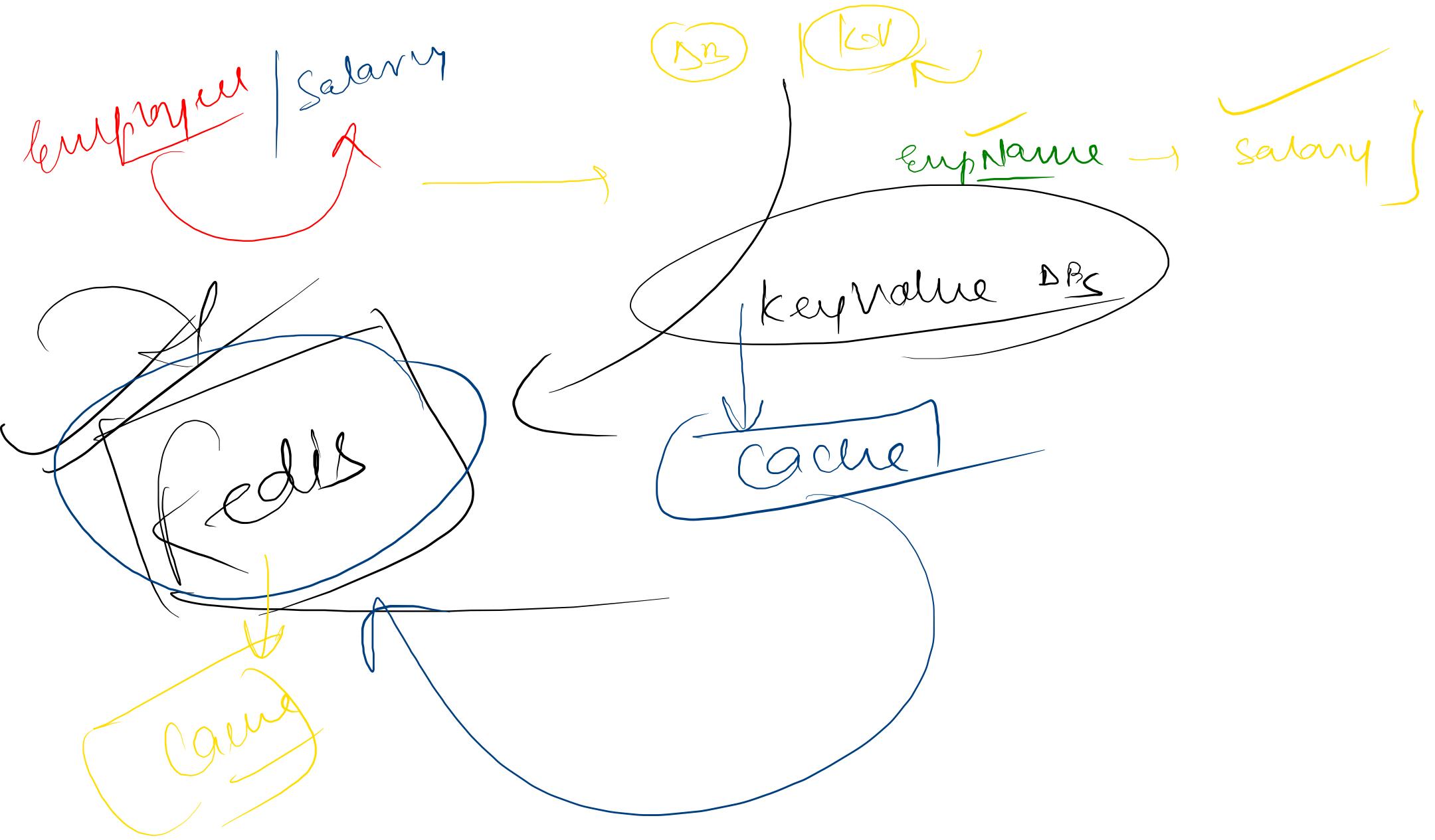
Horizontal
scalable
Distributed system

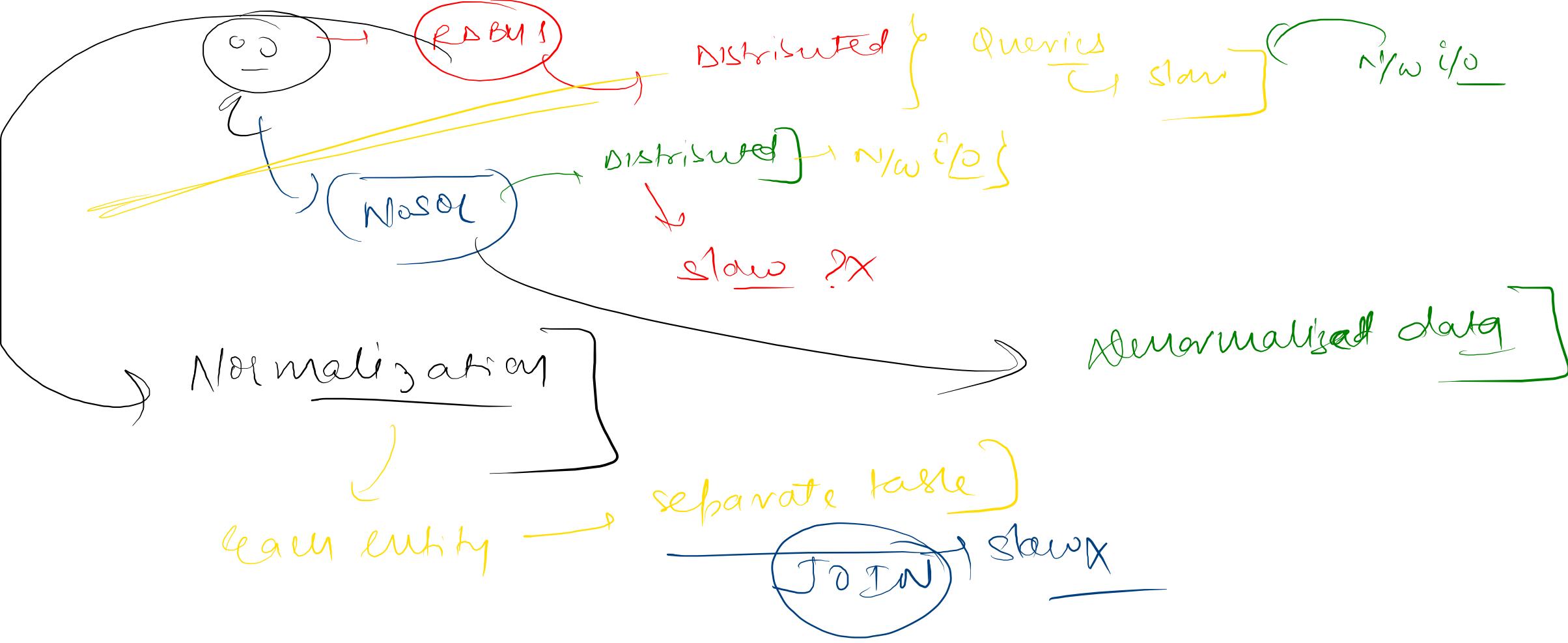




Nasal } $\xrightarrow{\quad}$ BA \rightleftharpoons E \leftarrow
 |
 |



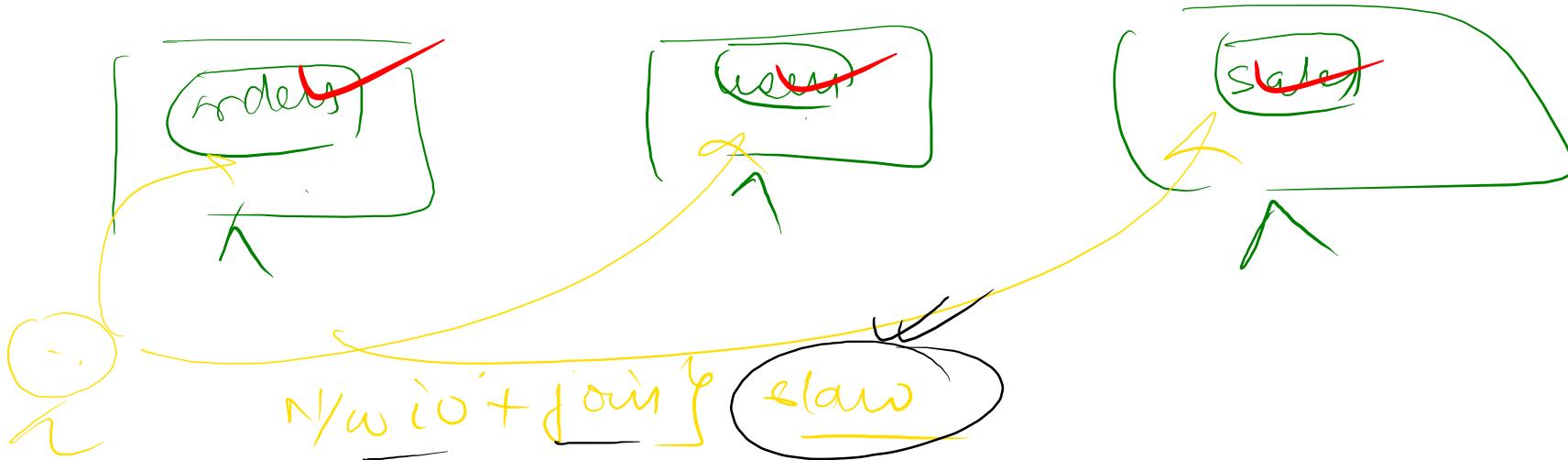




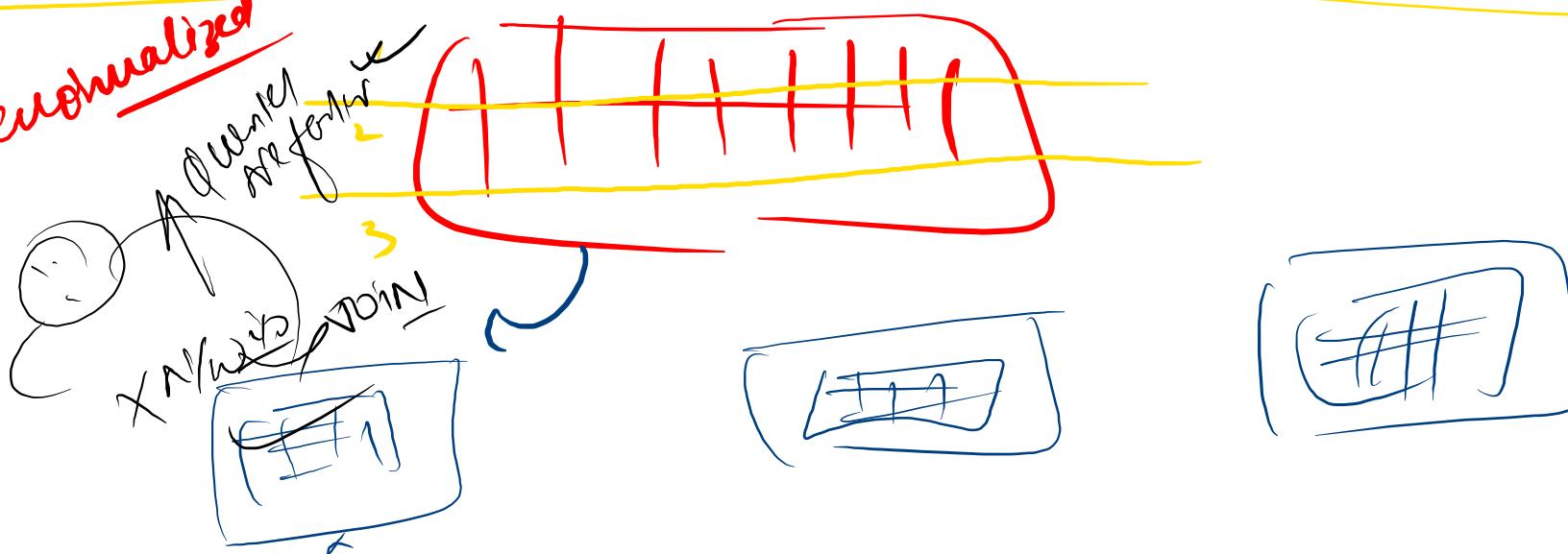
Symbol table has all information

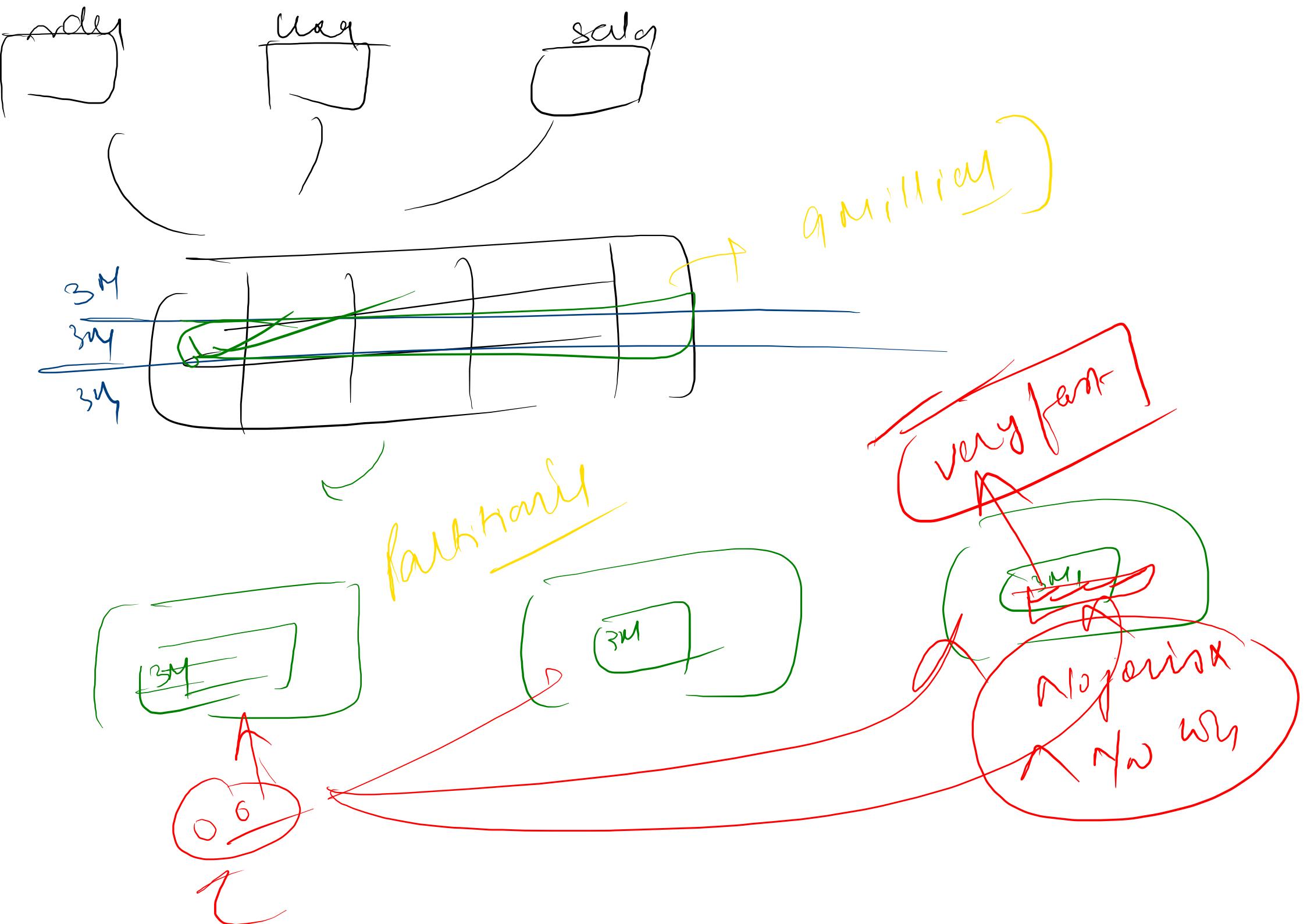


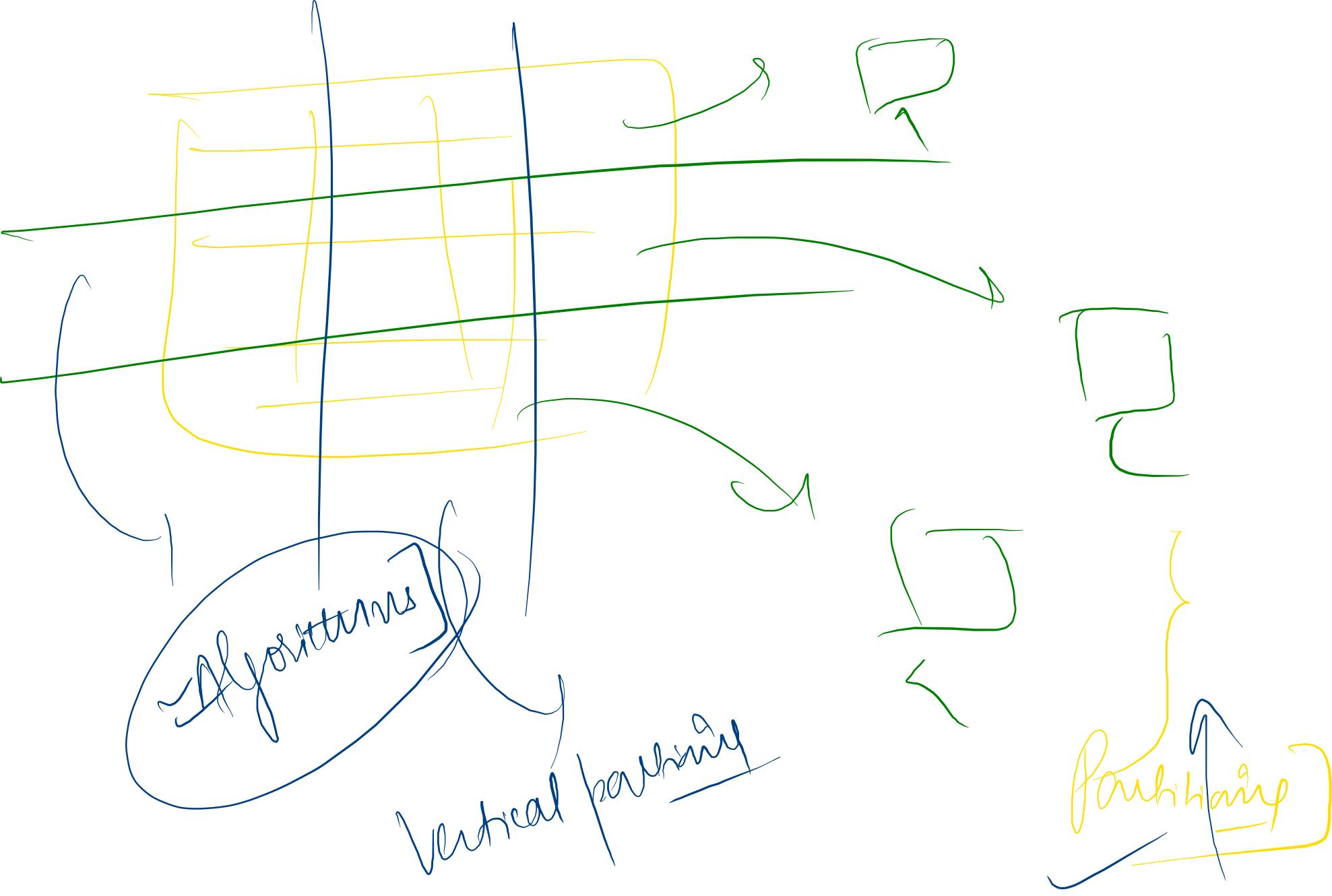
Normalized

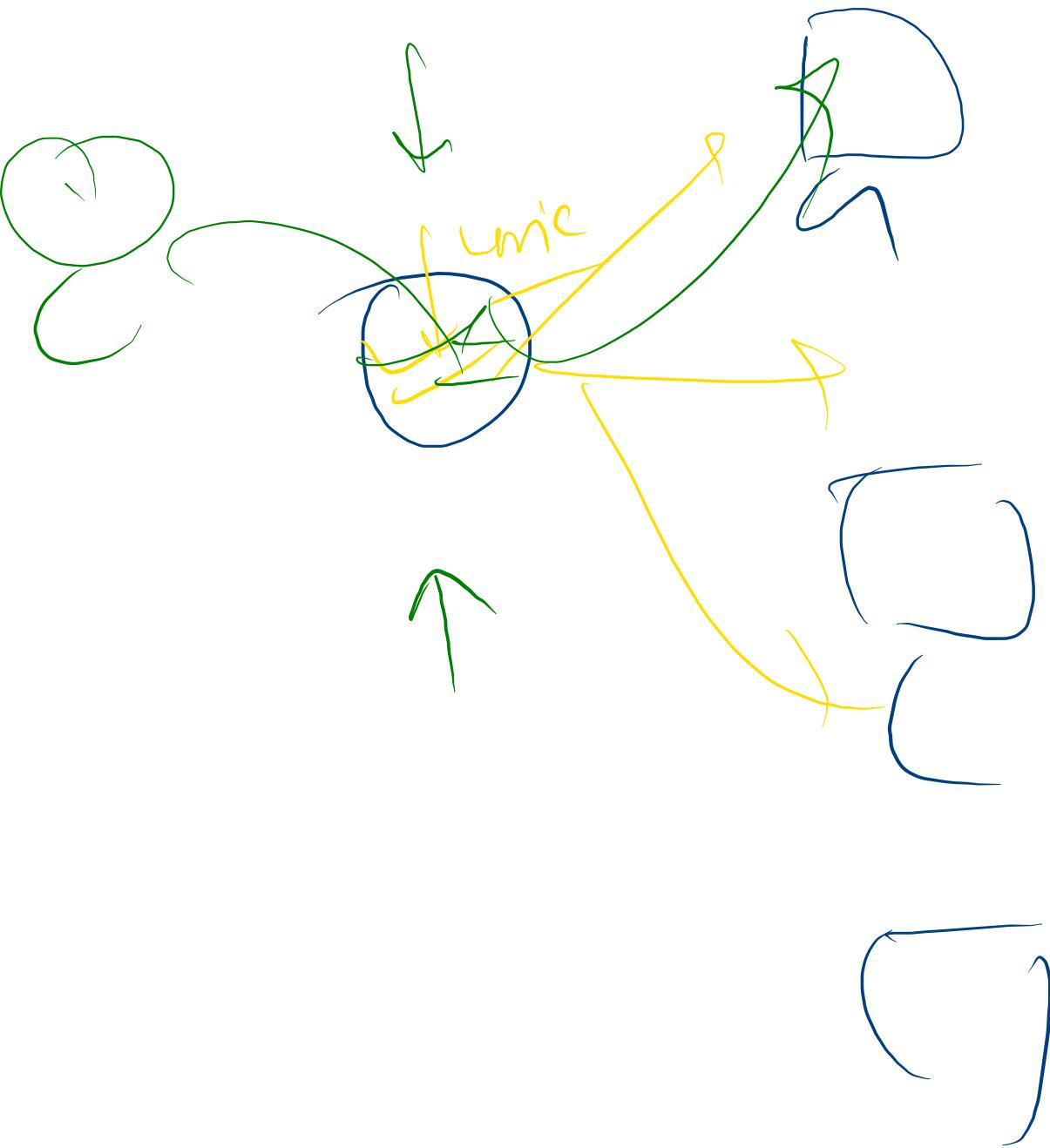


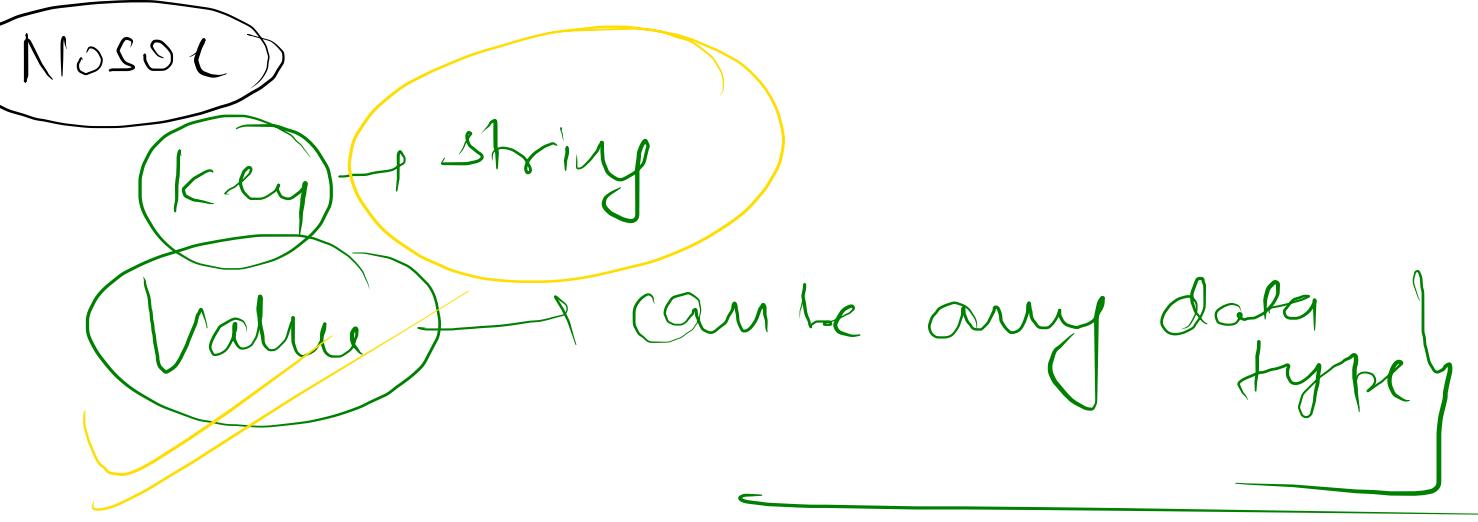
Denormalized

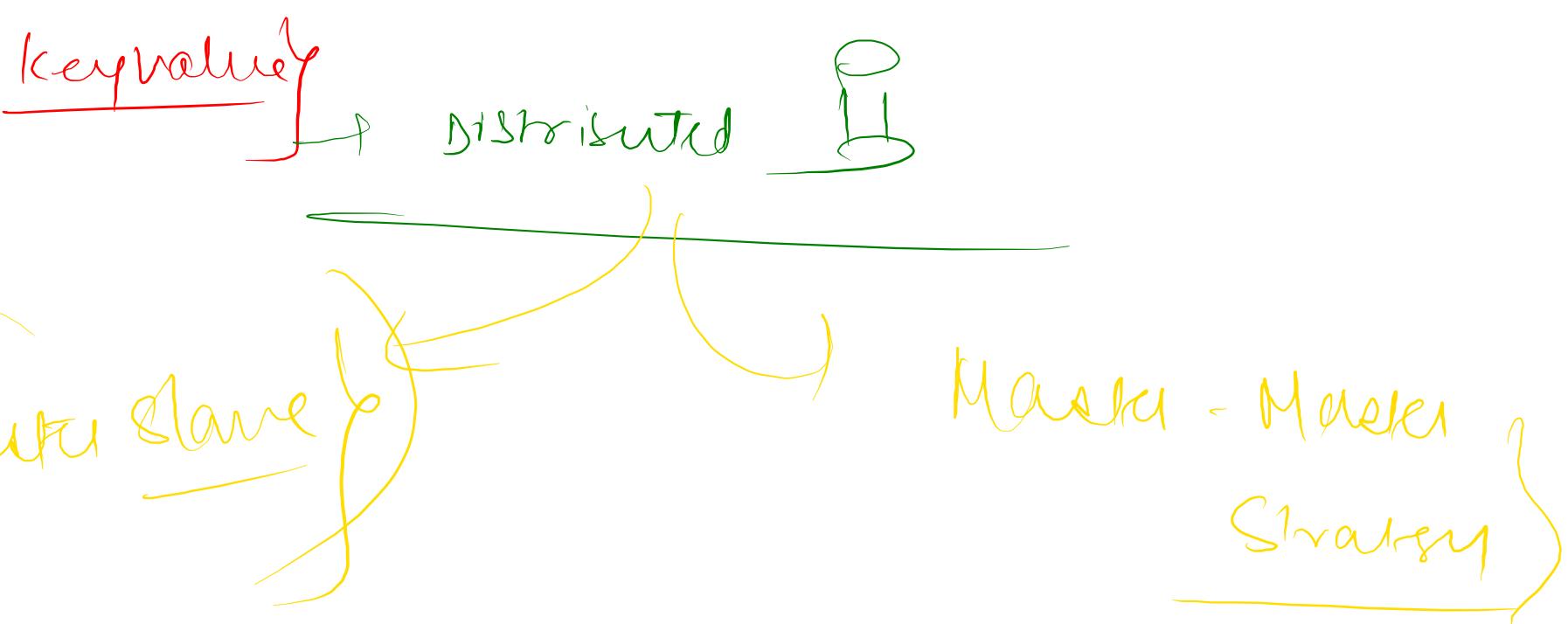




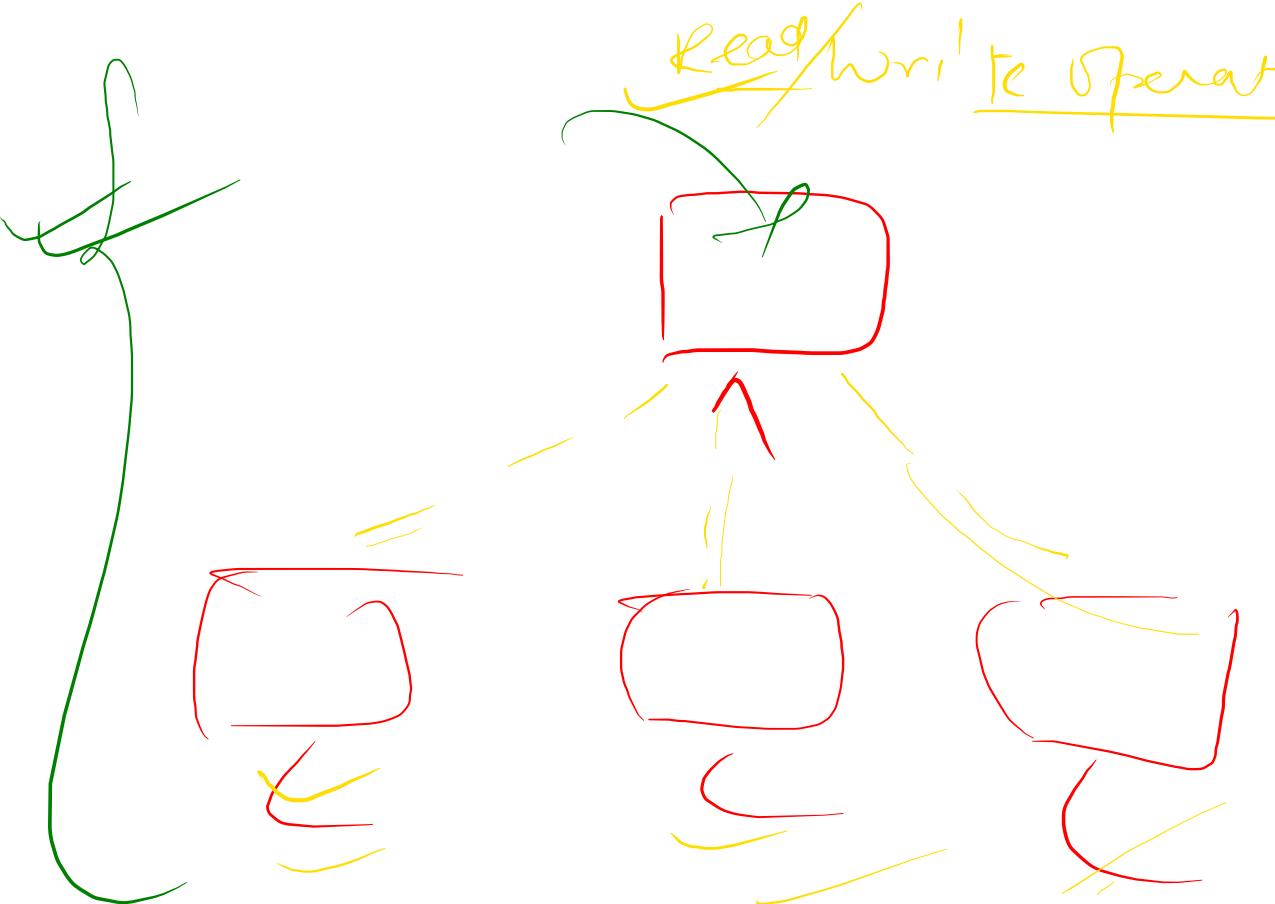








Read/write operation



Master-Master
Strategy



challenge

k-v

①

only support data

U(k,v)

②

Complex queries

queries based on keys

Cache

Million Records

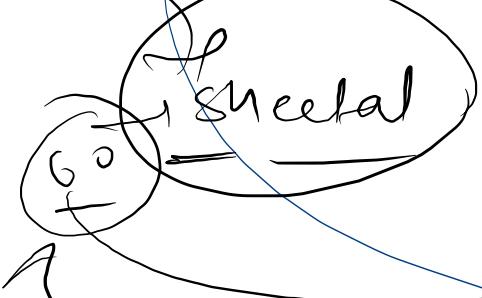
employee |

star salary

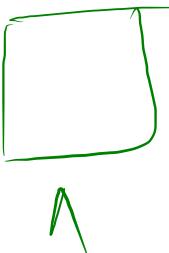
Partition

Alpha

Mam - 70



X



(A-F) ↓

3-3 taken

(G-L) ↓

3-3 taken

(M-Z) ↓

3-3 take

Relational

RDBMS

schema
transaction
less data

structured
data

BASE

NoSQL

keyvalue

ACID