Agenda.

→ SQL (VS) NoSQL Databases.

→ NOSQL.

```
  ┌── ─
  ├──→ ─
  ├──→ ─
  └──→ ─
```
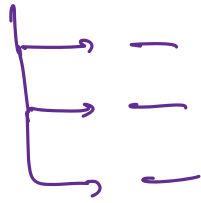
⇒ SQL (VS) NOSQL.

| SQL	NOSQL
⇒ Imagined to be vertically scaled.	⇒ Horizontal Scaling.
⇒ We can still horizontally scale SQL DBs, but ACID properties might get compromised in that case.	⇒ SHARDING KEY. ↳ Should be defined to make sure that the most frequently accessed query becomes intra shard.
⇒ ACID.	⇒ BASE.
	⇒ Usually follows BASE basically Available & Eventually Consistent

⇒ Fixed Schema.

⇒ Normalization.
  ↳ No redundancy.

↳ Usual practice but
  NOT the only practice.

⇒ No fixed schema.

⇒ Denormalization.
  ↳ Copy the data someodue
    inorder to optimise
    the inter shard
    query.
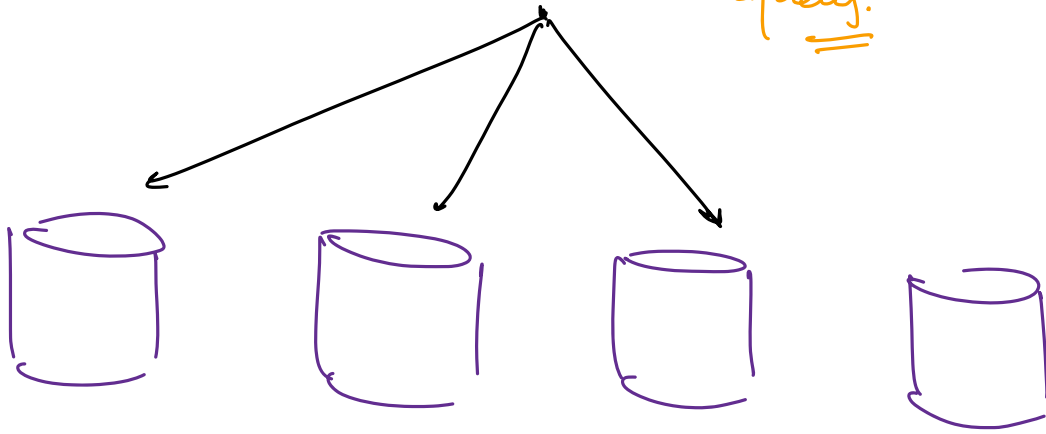
⇒ SQL Databases were imagined to be single m/c
  or Vertically scaled Systems to provide strong
  ACID guaranters 4 idea of Normalization

⇒ But if our data is distributed across multiple
  machines then some of our queries might
  become inter-shard queries, To optimise these
  queries we might have to add redeundant
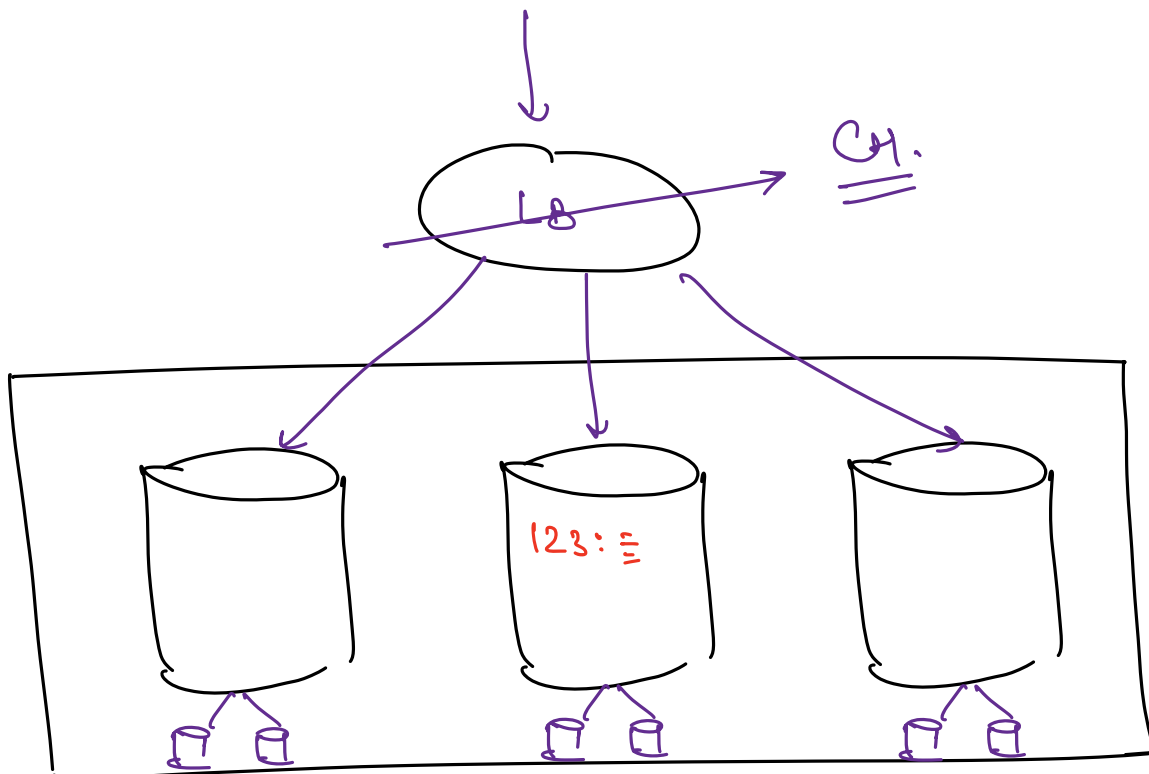 data at multiple machine. ⇒ DeNormalization

S₁   S₂   S₃

Master

Slave
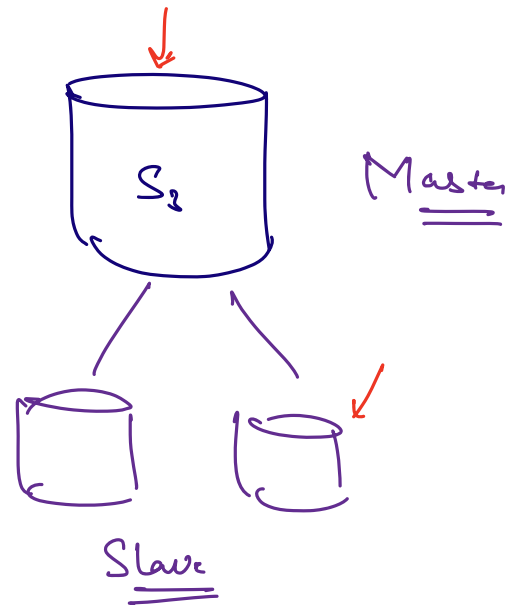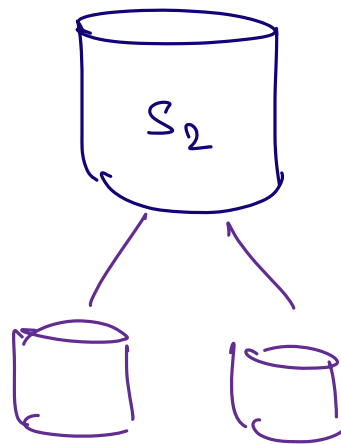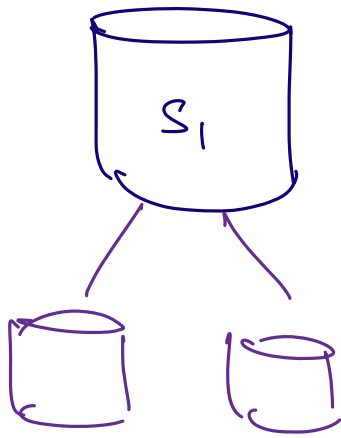
NoSQL.

→ Key - Value

→ Document

→ Column family.

→ Graph

Key - Value.

(Cache)

↳ REDIS. | MEMCACHED.

↳ AWS DynamoDB.

→ No fixed Schema

⟨ 100, ("shani", "shani@gmail.com", HLD, ...) ⟩

⟨ 123, ("Siddhesh", -------) ⟩ 丫

CH.

LB

123: ☰

⇒ (Caching) : Most general usecase 丫

K-V DB's.

⟹ Point Access.

Amazon's Product DB.
↳ filtering
↳ No fixed Schema.

Document based DB's
↳ Mongo DB / Elastic Search
↳ Enhanced Version of K-V pair DB.

{

doc-id :   {

← Key

JSON
XML

"id" : "1234",
"title" : "iphone 16 pro",
"price": "140000",
"category" : { "id" : "100".
                        "value" : "Mobile"
                  }

3

}

⇒ **Index** on Category | title | Price.

⇒ Elastic Search. : Search in log files.

        ↳ Inverted Index.

Class.

⇒ Trade Off.

⇒ Document based DB's are intelligent version of K-V pair DBs. It allows us to create indexes on the selected fields of the Document, which is going to optimise our Certain type of queries.