IIITD

Amazon SDE 2

DBMS 1

→ what?

→ why?

→ Examples

→ Details

→ ER diagram

DBMS 2

→ Normalization

DBMS 3

→ Transactions

locks

DBMS 4

→ queries

Relational Databases (SQL)

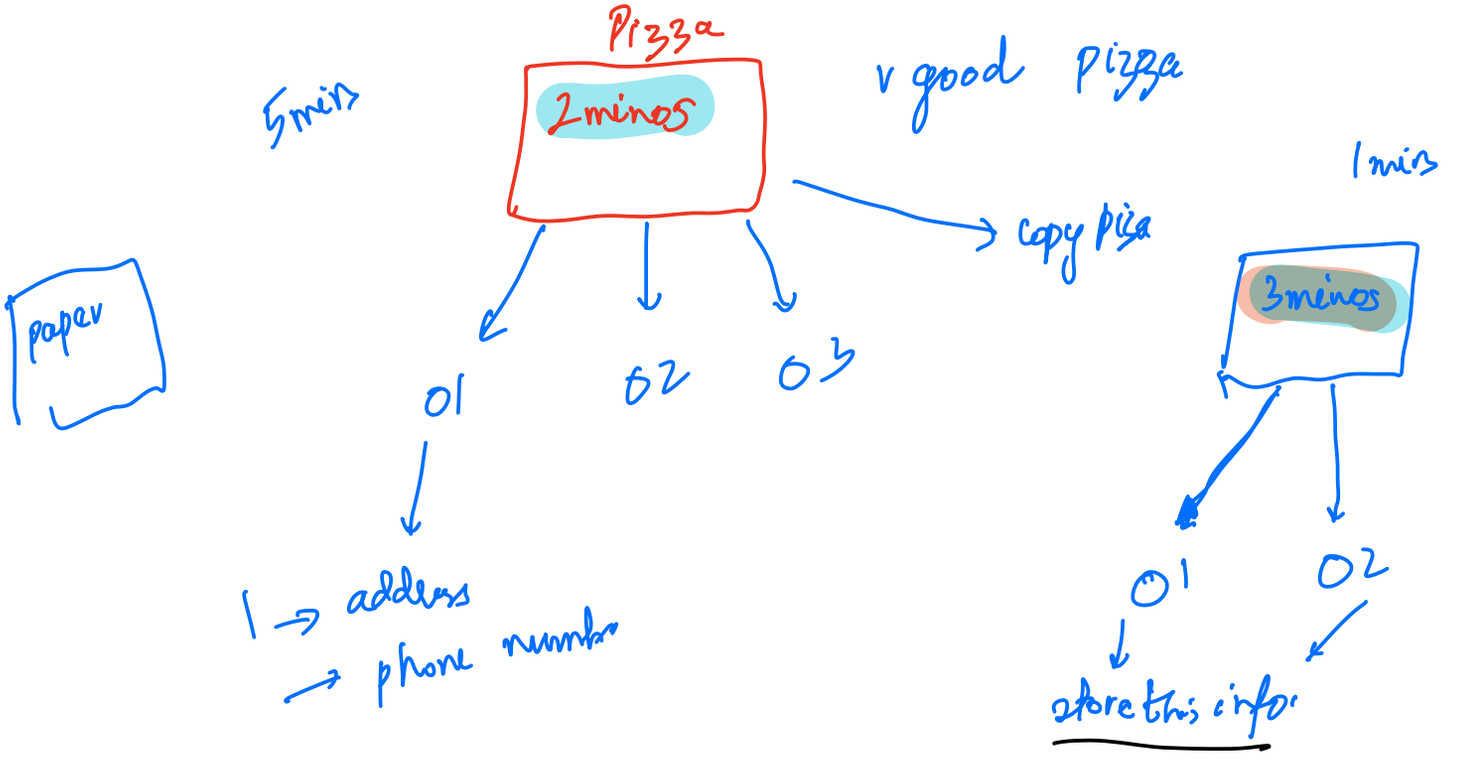
No-SQL (project) (HLD)

What is DBMS?

MySQL ⟶ ? Database?

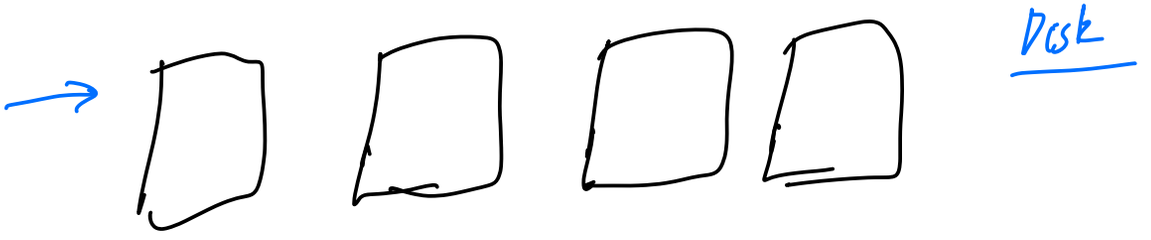
Database Management systems

Why?



Files (1960s) text, json

→ login in a page



DBMS (SQL) ← data

Extremely fast

RAM, Disk

Advantages

→ It helps in putting, deleting, updating and retrieving data

C R U D

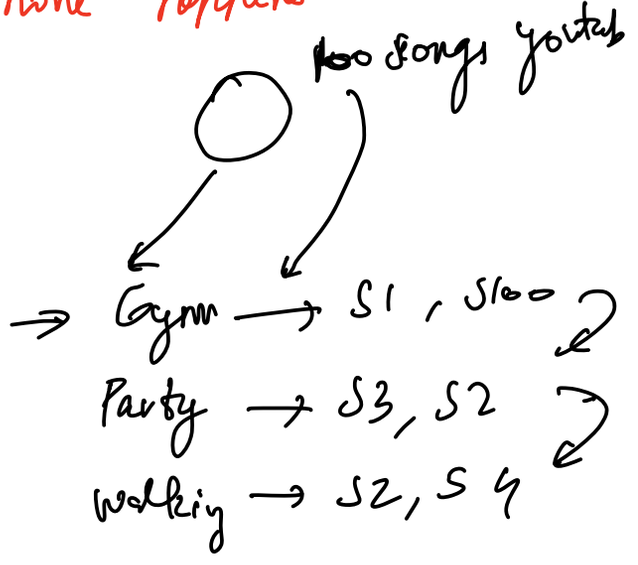
- C → Create
- R → retrieve
- U → update
- D → delete

→ security

→ atomicity → either all operations or none happens

→ consistency

⋮



Keywords related to DBMS

→ Entity: Core properties of the data or identities of the or the nouns of the data

UBER → cabs, rider, drivers, payments, bookings

SCALER → learners, instructors, course

→ attributes → data that entities store

drivers

→ driverid

→ name

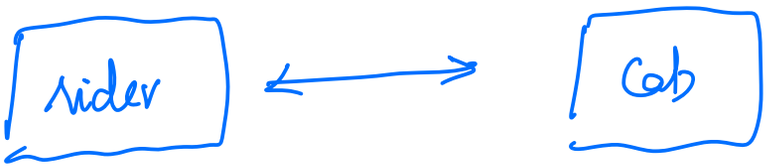
→ mob no.

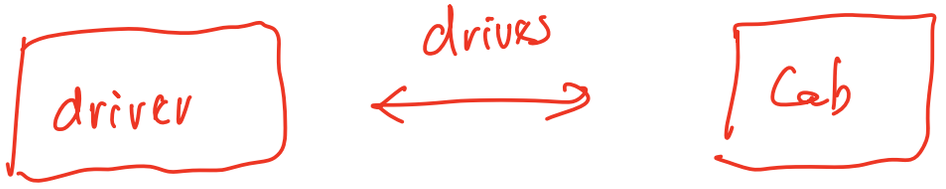
→ Rating

Cab

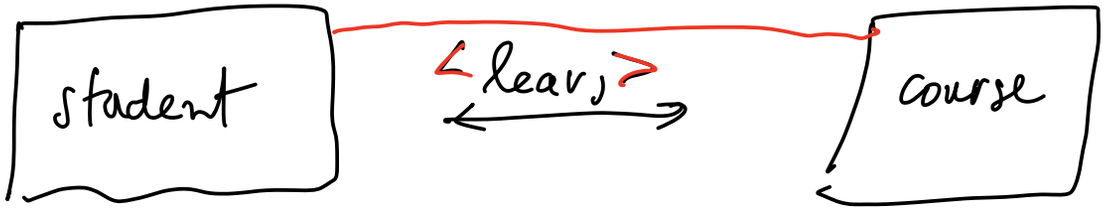
→ Car no.

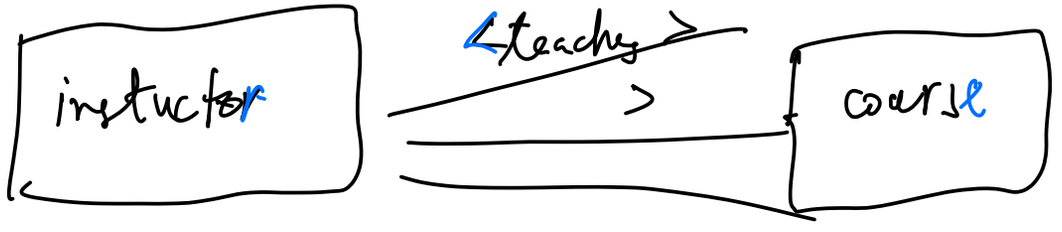
relationships : The relation held b/w two entities




driver
drives
Cab

A → B → C


student
learns
course


instructor
teaches
course

Attributes

→ Simple : stand alone attributes

phone number , RollNo. ,
employeId , emailId

→ composite attribute : when more than 1 simple attribute is used

Full name

→ Derived attributes : DOB → age

rating →

→ Multivalued attributes: phone No., email address

How is data stored?

Student

Roll No	Name	contactNo	dob
23	Sanyv	100	1996
24	Sanjiv	101	1996

Row of data

Record

tuple

(Name, dob) composite

Keys! (Identifiers)

Super key : set of attributes that accurately define a row

name : Ashish Kumar college: BPIT

branch : ECE ;; 25

(Super key) : Name, phone number ←

Name, dob ←

Name, dob, phone number

phone No.

Roll No.

Roll, dob

which is also SK

Candidate key : smallest subset of super keys is called candidate key

Name , phone No. , dob — (multiple attributes)

↓

→ phone No ←

Roll, Name

↓

→ Roll No

Yes ! K1 K2

{ (A1, A2), (A2, A3) }

E phoneNo, RollNo)

Primary key : One chosen value out of all candidate keys

1 chosen values (multiple attributes)

Break!

10:22 – 10:32

Fname Lname ------

Parikh Pruth

Parikh Rens

Purohit Singh

PK

(Fname, Lname) Candidate

Composite key: any key made of more than 1 attribute

Foreign keys

Student

Name	phNo	(department Id)
Parish	600	1
Sanju	601	2

DepartmId	Departmt
1	Bio
2	Eng

→ foreign key for student

→ FK should be CK

→ foreign key does not have to be primary

→ foreign key can be made of more than 1 attribut

Cardinality (numbers)

UBER

One - One :

one driver ⟷ 1 cab

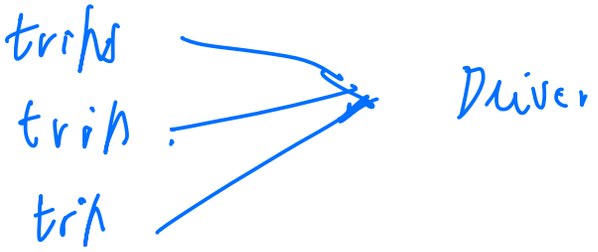
one driver ⟷ 1 booking

One - Many :

1 driver ⟷ trips

1 rider ⟷ trips, trips, trips

Many - One :



Many - Many:

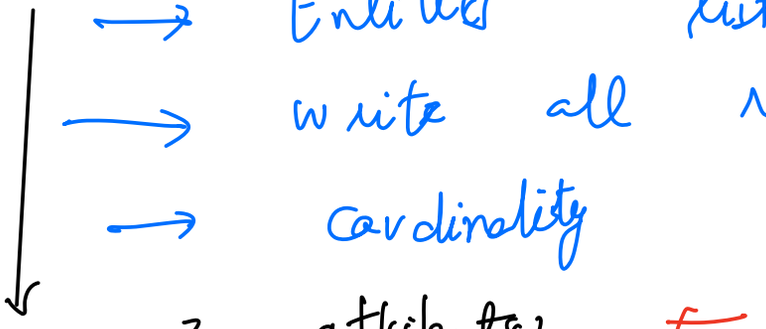
Riders = Drivers

Many - Many

Normalization

ER Diagram

(Entity Relation Diagram)



→ Entities list all the entities

→ write all relationships

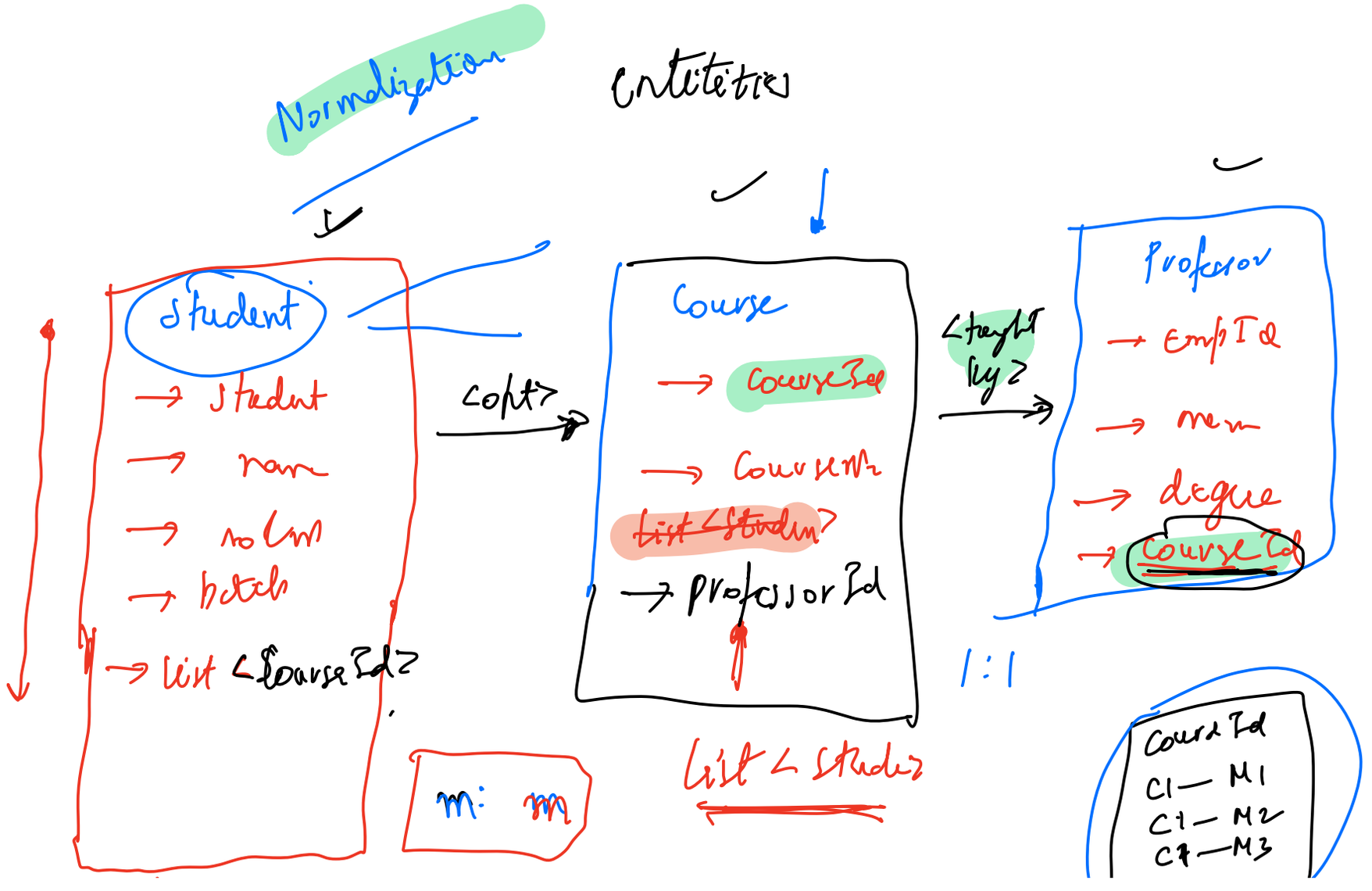
→ cardinality

→ attributes

Rectangle →

Ellipse →

Design ER diagram for a university where



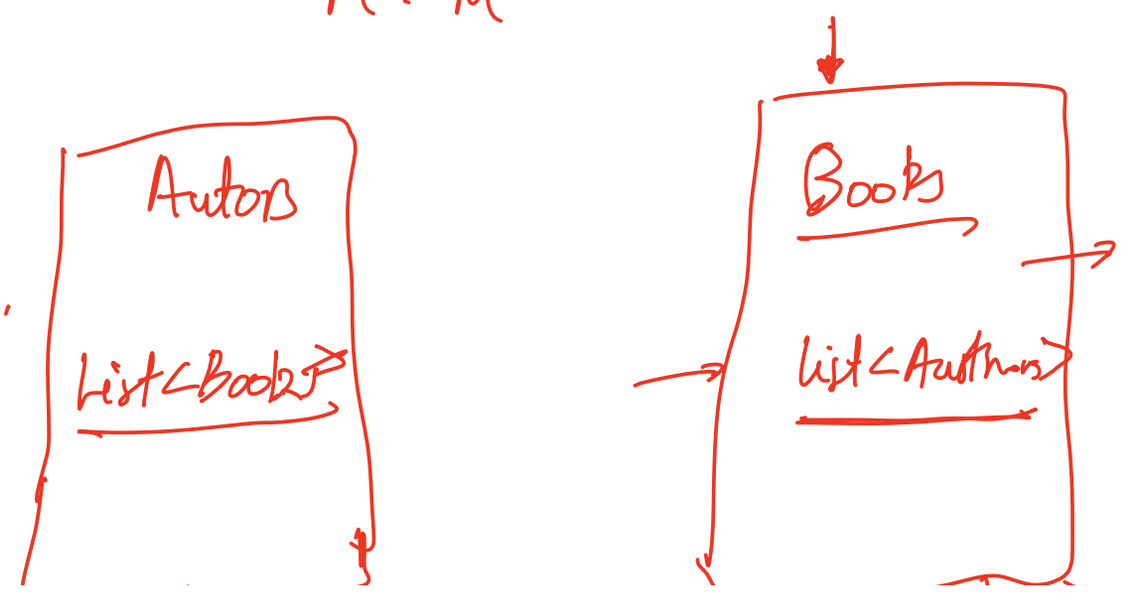
t
Course ?

HW

→ Functial dependencies
(Normalization)

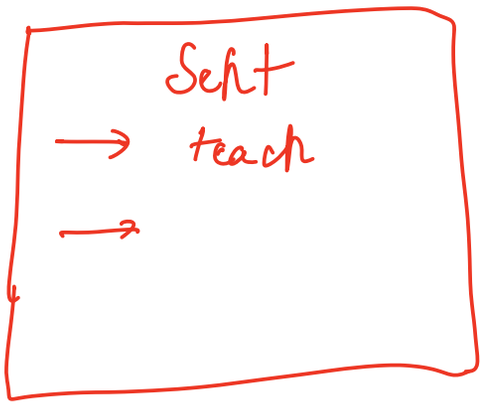
Done!

M : M



Name
BookId


B1
B2
B3
B4
A1
A2
A3


Self
teach


B1
B2