

DMS

Unit 1: Intro

data :- any fact or figure about an entity

Information :- Raw data } Based on process.

info's info

Database :- Structured collection of data with ease of data management

DBMS :- Software managing databases with features

6 efficient

data access + * client vs file

data abstraction + DBMS > File System

data

data objects

data integrity +

No data

atomicity, consistency +

No data

concurrency +

No data

No conflict of scale

in one commit order

View of

DB data

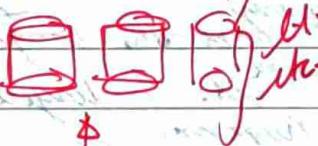
abstraction

upward
downward
other

Physical level schema

relations

DB Administration

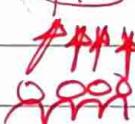


Logical level / Conceptual level

entity-relationship



pinnacle of data abstraction



User - interest areas

Data independence :- capacity to change schema of one level without interfering with higher level (modularity)

Physical data analysis.

modify :- internal schema

not interfering :- conceptual schema

modify index, query, filter etc.

Logical data analysis.

conceptual schema

external schema / copy + 1 - entities, etc.

Instance of database :- snapshot of db contains live data
 President current value & transaction
 (current info stored)

db schema :- overall design of db



obj, rel, i.e. blueprint

Data processing ways

OLAP

Online Analytical
Processing

OLTP

Online Transaction
Processing

~ SSD

~ RAM

~ Historical data

~ Current data

Primary
key.

Complex data

daily data from.

DB design

Non-normalized

normalized schema for query optimization.

Query
complexity

join query done
computation

single standard query

data
red.

longer for historical only.

smaller trans.

Response
time

Slow

fast RT. for high

↓
Opport

CRUD operation (Create, Read, update, delete)

insert
update
delete

Types of dbBusiness oriented.

- ① commercial db log. of trans & cust. data
CRM sys. like salesforce

- ② multimedia db media

Adobe experience manager
Yt

- ③ production db logic prog. logics to derive info from db
(more complex)
db using logic (a query longer)
only query long
rule based process

- ④ Temporal db keep change of data over time, historical
more market
pharmacy

- ⑤ GIS (Geographical Info. Sys.)

mapping proj.
eg map

- # DAM (Digital Asset Management) to good controller of data
or storage of all of this

- ⑥ Schema definition

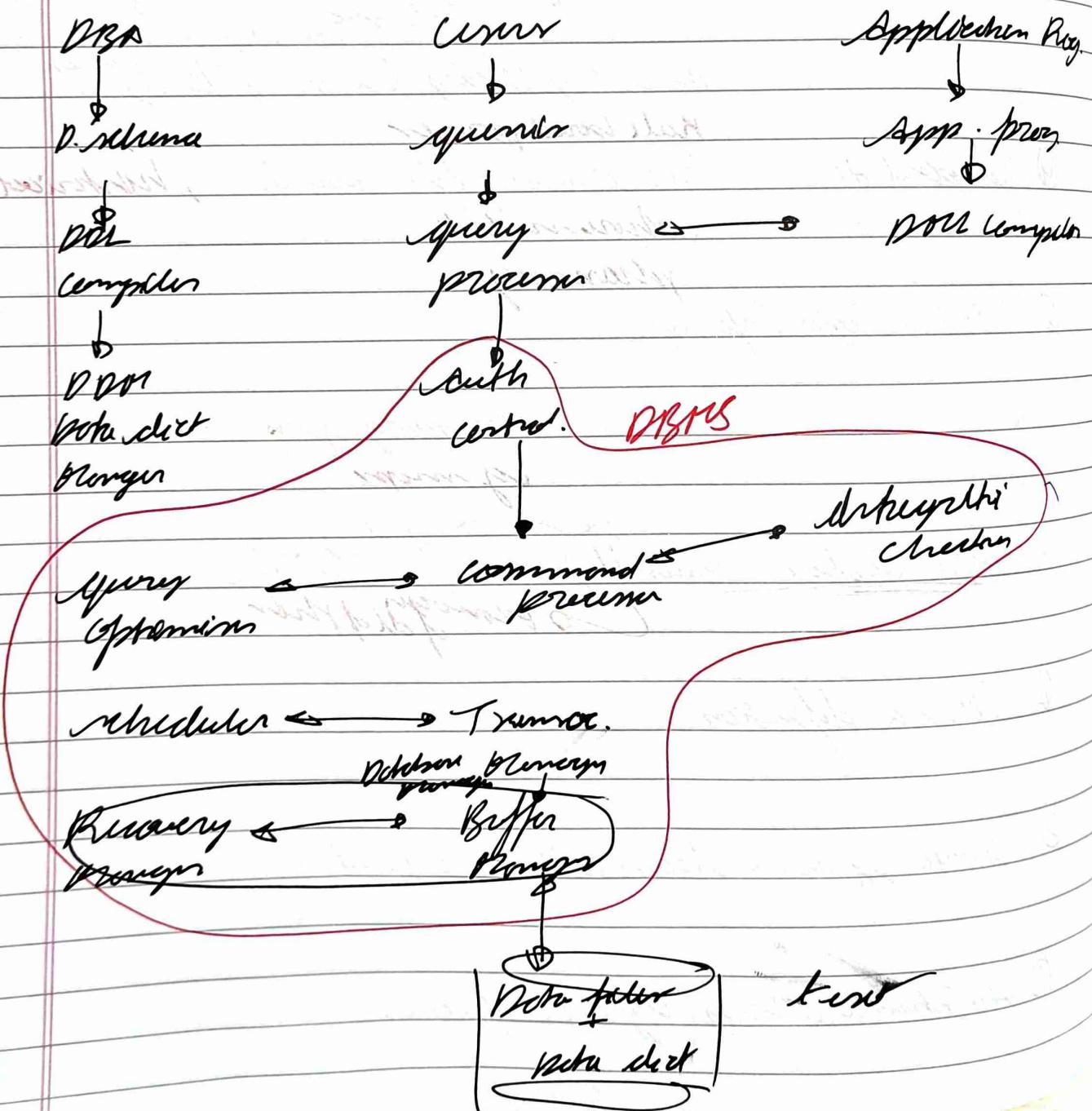
- ⑦ Storage struc. & detailed definition

- ⑧ Schema vs Phy. org. modification

④ Gravitating of auth. for Data Access

⑤ Integrity constraint Specification

DDBS
Architecture



1. *execute user queries*

Query Processor

DQL → SQL statements
DCL
Compiler

DML → executable
DML interpreter

Embedded DML Pre-compiler → procedure calls

Query optimizer → efficient plans

2. *DB control System*
Storage
Manager

Auth.

Manager

Transaction management

Manager

Integrity manager
Manager

File manager files
clr

3. Disk
Storage

data files actual data

data dictionary Rsys

Buffer manager cache

Indices for quick retrieval.

Draws
components

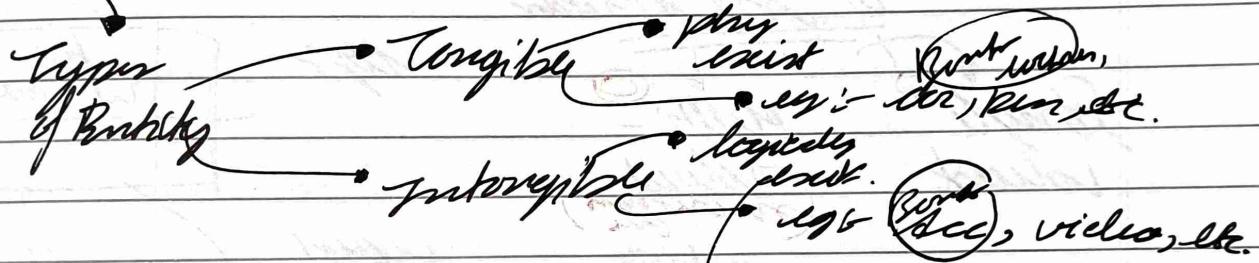
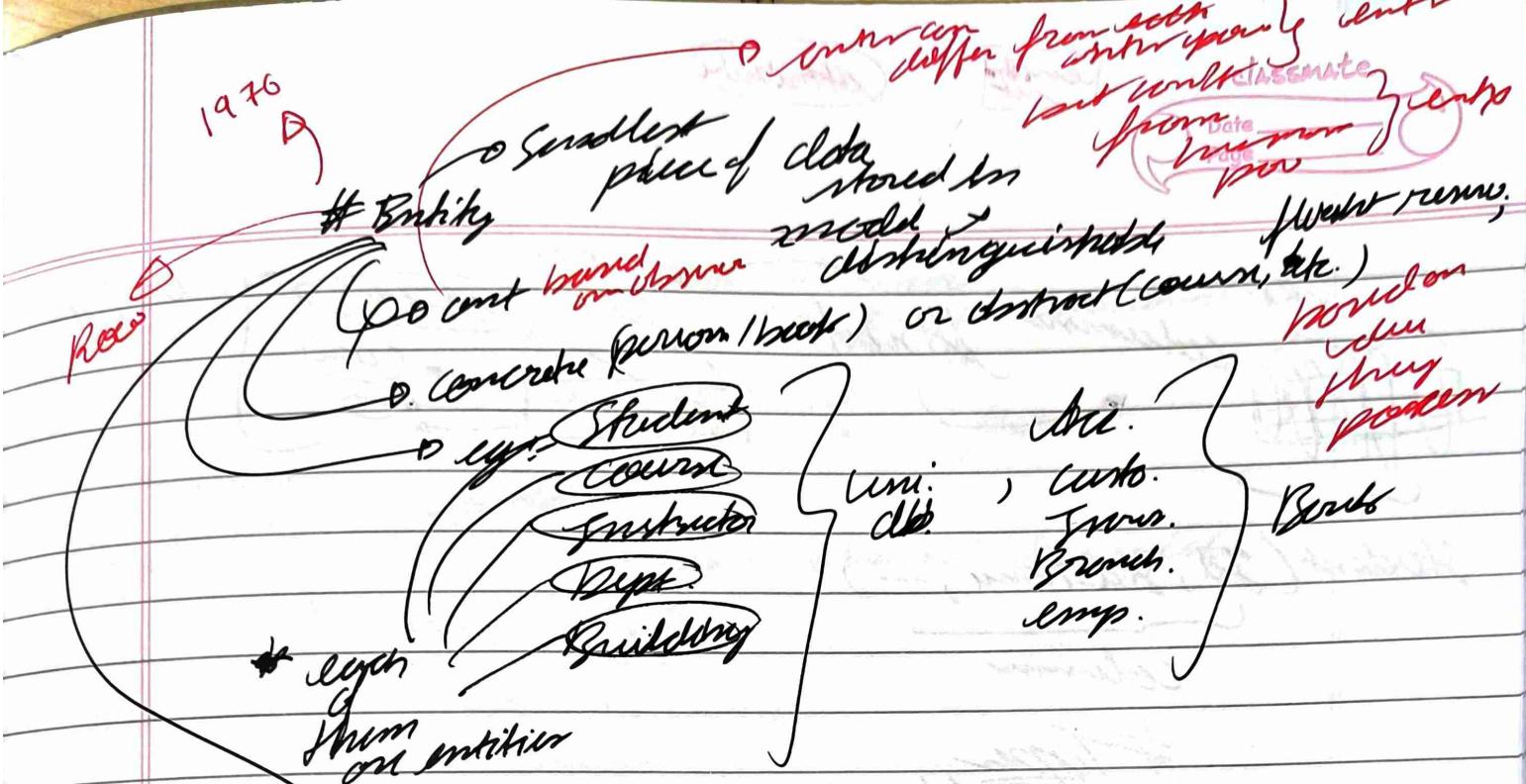
Inherited
need
Copy
Conceptual
need
Copy

Referred
need
Copy

BR Diagram
proj.
CP for
from
textbook
sample
programme

My

1976



* each row is an entity → can't be represented in TERD

ERD to understand Entity Schema

Entity Set

* Rel. / Table = collection of entities (Row)

entity set

RRD

Rel. Model

Table = Rel
= Entity

each row is an entity

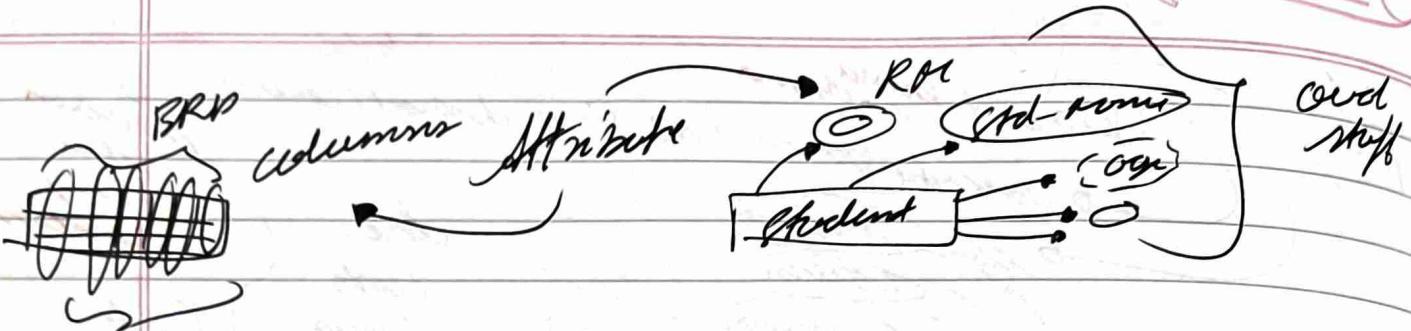
table

Attribute
Column

prop. / char. of entities

to columns

(pervision)



Student (Id, Std-Name, ...)

columns

Types of Attributes

String
valued

multi-valued
(more than one)

* -
* addition no,
dob, etc.

* multi-valued
var. Ext. name (jagged)

, colors
, emails

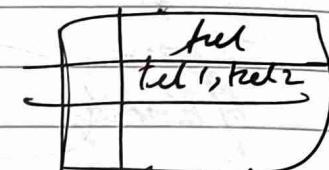
, address, etc.

* (3 RDB price)

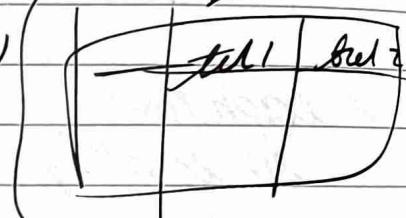
* Sep. table

of each
multivalued
attribute,
say today's moa
is part of main
table or put in
new table

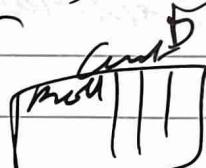
1) :



B



2) :



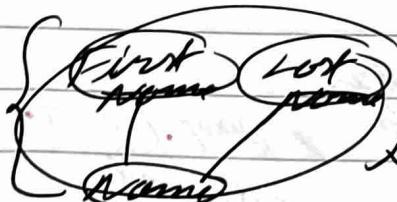
D

Sample → age, etc.

can't divided further

Composite → ERD

divided further



in a Rel. model.

reported by
a reporte column.

↳ Stored

(data)

↳ ~~current date - data~~

Main data collected
values from db permanently
stored in db.

e.g.: data, etc.

↳ date - of birth

↳ derived

↳ derived

e.g.: age (can be derived from data)

RRB { age }

↳ ~~derived~~

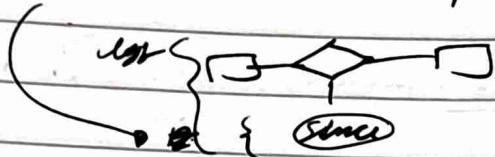
→ Description attribute

(attribute)

here null =
not applicable

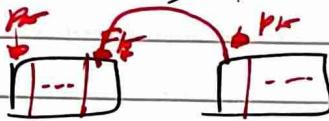
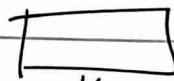
exp

Dom. → for entities
attribute → for p/s



Rel. Association b/w 2 or more semantically intergrated

ERD

Rel.
tableplay
with
paraph

Rel. const-rols components

Nomy
Amiqui

Beyus

standard
cons. (ord. ratio,)
(policy)

Day of Rel. / Rel. nt

○ no of □ with □

* Unary (Self Rel.) *A member in a team*

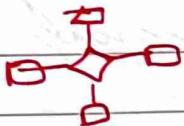
Supervisor



Ternary



Quaternary



N-ary



Sym. conv.

no mid

Flipping Card / Card
Retriever

T:1

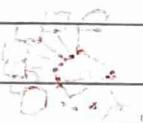
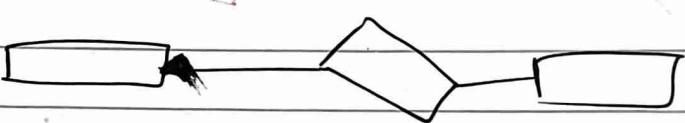
"either don't participate or don't even attend at all"

Instructor may advise at most one student, and a student may have at most one adviser.



T:01

Instr. may advise many std, std may have at most one adviser.



T:1



Instr. teach many students at a time from many yrs.
, instruction only on

T: N



— — —

Part. ~~total~~ ~~part~~
Count.

partid =
total =

each book must

have author,

but there can be
authors without

books



* you can have author
without books
like doc. without patient



New PK ✓

No

Pls, other conditions

entity set

everywhere
of course
0 JOPK
above off.

Pay no

Doc

word

fixed
partici-
(title)



SFK

loan pay
total rec

Pay

SIKR
(no policy)

face loan no + Pay = keys of Dtable
 --- payment

Reason of
SIKR set

* detailed proc needed : ER Diagram \rightarrow Rel. Model

* cardinality \rightarrow strong
 ref \rightarrow weak \rightarrow sup form
 \rightarrow weak \rightarrow false
 cardinality \rightarrow identification

* Relationship

- \rightarrow many \rightarrow no sup table \rightarrow new col which do not fit to some table total
- \rightarrow 1:1 \rightarrow " \rightarrow both often weaker priority
- \rightarrow 1:n or m:1 \rightarrow " \rightarrow modify in existing relationship
- \rightarrow m:n \rightarrow sup. table \rightarrow both ph cont. both new table (consistency)
- \rightarrow 3 or more

(\rightarrow ph part of all
 participation
 identify relation
 ph is doctor
 their common
 ph don't have
 new table
 or ph on
 attributes
 requirement

- \rightarrow Attribute ~~table~~ declare cols of ph
 \rightarrow of required ph attr
- \rightarrow multivalued \rightarrow multi-valued att. where ph is applicable to required part
- \rightarrow composite

(\rightarrow A sup column
 must be taken
 for all simple
 attributes
 of the composite
 attribute

(bottom up)

Generalization

merge 2 lower level entities to create a higher

o abstraction → easy



(top down)

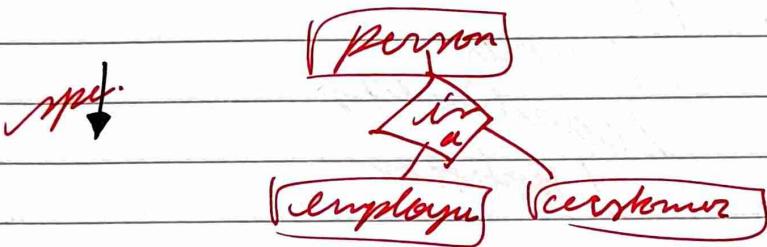
Specialization

o apply gen

o split

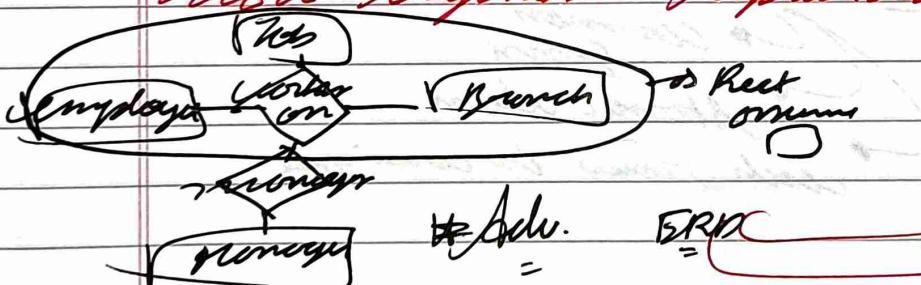
o higher to lower

o complex details



Aggregation

a concept wherein an entity is abstracted to form higher level entities involving a more organized representation of complex entities.



Adv.

= ERD

o simple

o easy

o BRN → R.F.

Dr. = ERD

o simplified
o concentrated

o closed

o less info content
complex
forwardly proj.