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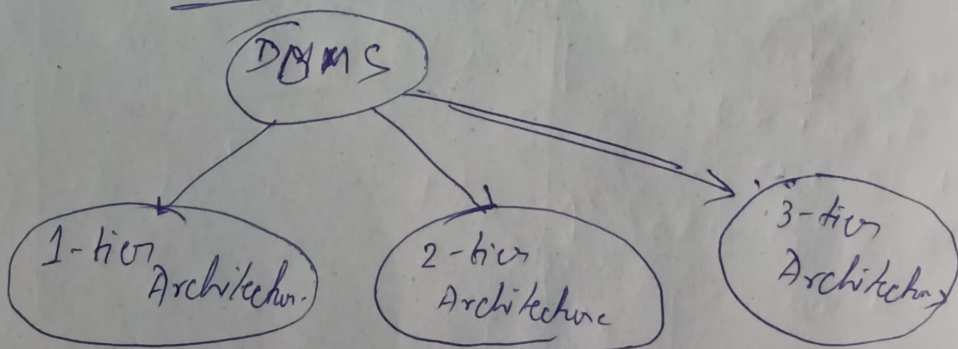
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Answer

1. A) Data Independence is defined as a property of DBMS that helps you to change the database schema at 1 level of a database system without requiring to change the schema at next level. Data Independence helps to keep data separated from all programs that make use of it.

It is essential as it helps to improve the quality of data, improves database security. Also we don't need to change data structure in application program.

→ DBMS Architecture



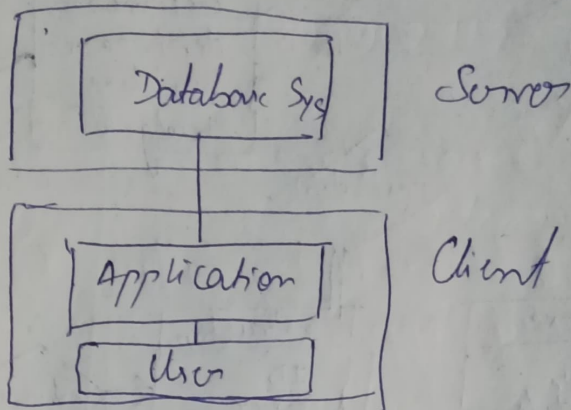
• 1-tier Architecture :-

→ Here database is directly available to user. User can directly use it.

→ Used for development of local application.

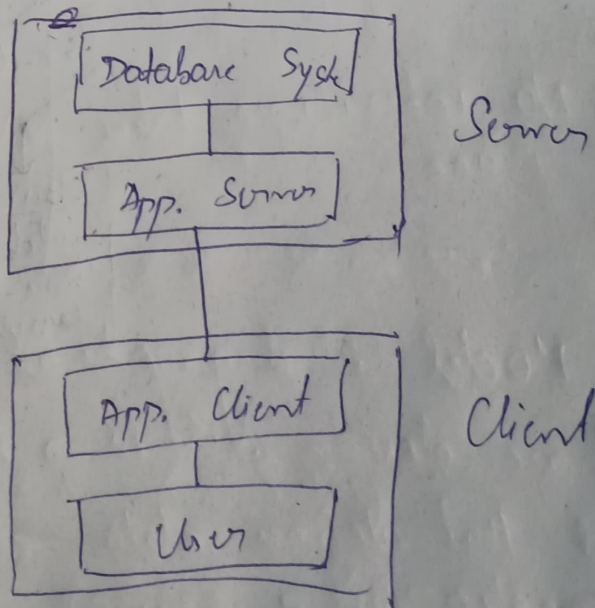
• 2-tier Architecture

- Same as basic client-server.
- Application on client side can directly communicate with database in server side.

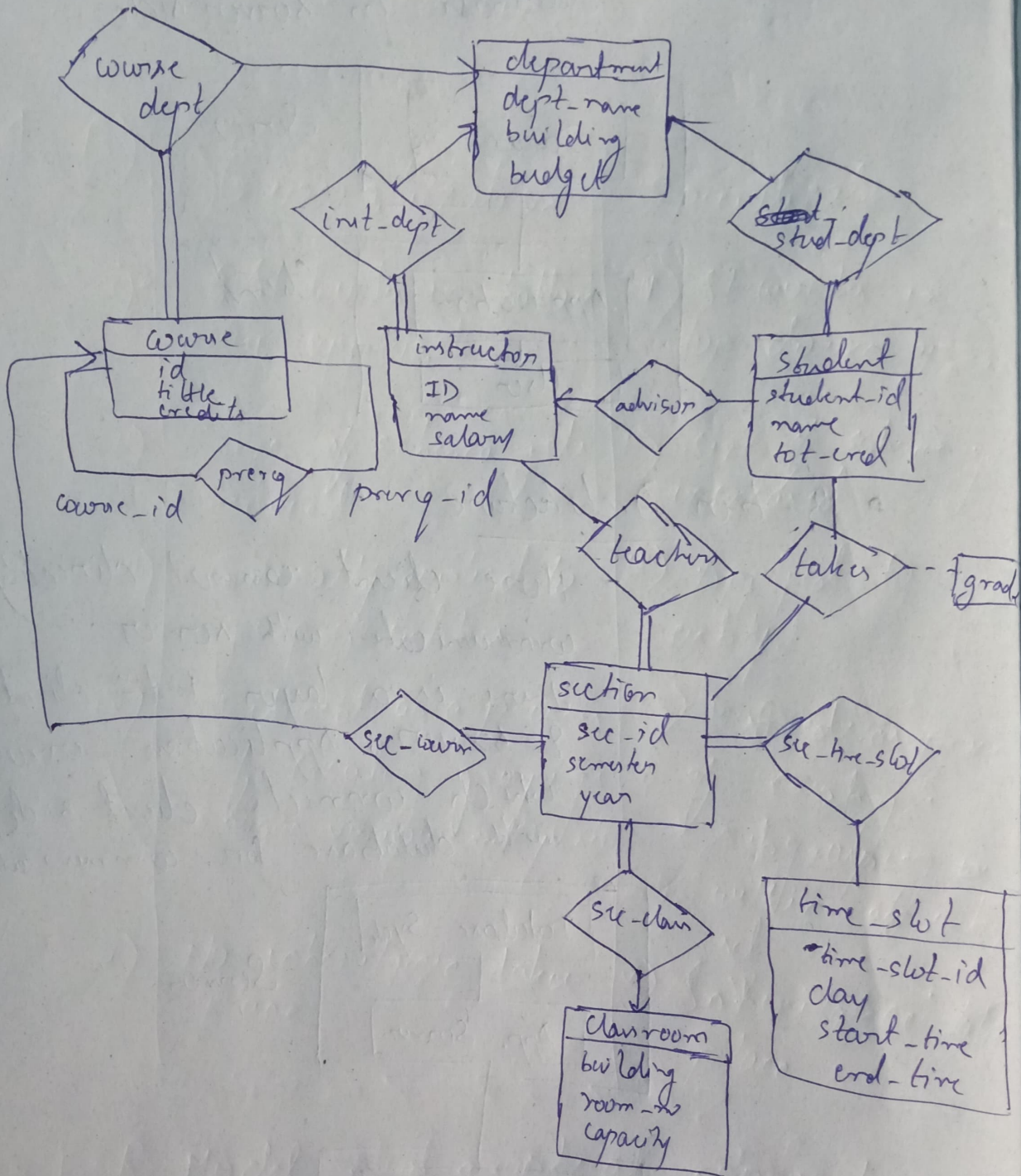


• 3-tier Architecture

- Here client cannot directly communicate with server.
- There is a layer betⁿ client & server, Application Server which connects client side with database for communication.



2. A) E-R Diagram for University Enterprise



3. DBMS schema

It's also called design of database.
There are basically 3 types -

→ Physical schema :-

* Design of a database at physical level.

* How the data stored in blocks of storage is described.

→ Logical schema -

* Design of database at logical level.

* Programmers & database administrators describe certain type of data records get stored in Data Structure.

→ View schema

* Design of database at view level.

* Describes end user interaction with database system.

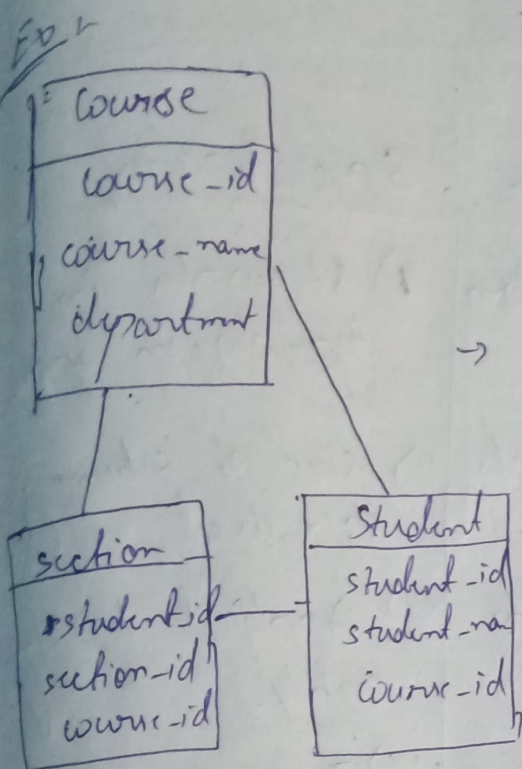
⇒ Domain Constraints

→ They are user-defined data type.

→ Define them :-

Domain constraints = data type + constraints

(NOT NULL / UNIQUE / PRIMARY KEY / FOREIGN KEY / CHECK / DEFAULT)

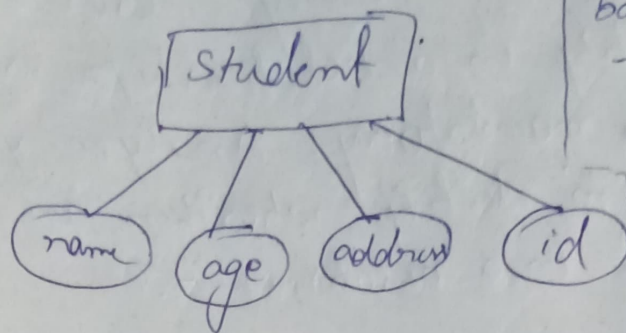


Ex - create table student-info (
 stud-id id-value PRIMARY key
 stud-name varchar (30),
 stud-age int
);

4 B)	Generalization	Specialization
i)	It works in bottom up approach	ii) It works in top-down approach
ii)	Size of schema gets reduced.	iii) size of schema gets increased
iii)	Generally applied to group of entities	iv) Applied to single entity.
iv)	Defined as a process of creating groupings from various entity sets	v) Defined as process of creating subgrouping within an entity set
v)	No inheritance takes place	vi) Inheritance takes place

⇒ E-R Model is a graphical approach to database design. It is a high level data model that defines data elements & their relationship for a specific software system.

Ex 1



E-R Model
based on 3 concepts
-pts:-
1) Entities
2) Attributes
3) Relationships

5.A) Constraints in ER Model

They are part of schema of database

⇒ Types:-

a) Key :- Attribute or set of attributes that uniquely identify an entity within its entity sets

b) Single value constraints :-

Require that a value be unique in certain context.

c) Referential integrity constraints :-

Require that a value referred to actually exist in the database.

d) Domain Constraints :-

Specify what set of values an attribute can take

e) General Constraints :-

Attributes that should hold in database.

Existence dependency describes whether an entity in a relationship is optional or ~~mandatory~~ mandatory. Analyze your business rules to identify whether an entity must exist in a relationship.

6B) ii)

X	Y	Z
1	4	2
1	5	3
1	6	3
3	2	2

1. $XY \rightarrow Z$ && $XZ \rightarrow Y$
valid invalid

$\therefore XY \rightarrow Z$ && $XZ \rightarrow Y$ is invalid

2. $YZ \rightarrow X$ && $Y \rightarrow Z$
valid valid

$\therefore YZ \rightarrow X$ && $Y \rightarrow Z$ is valid

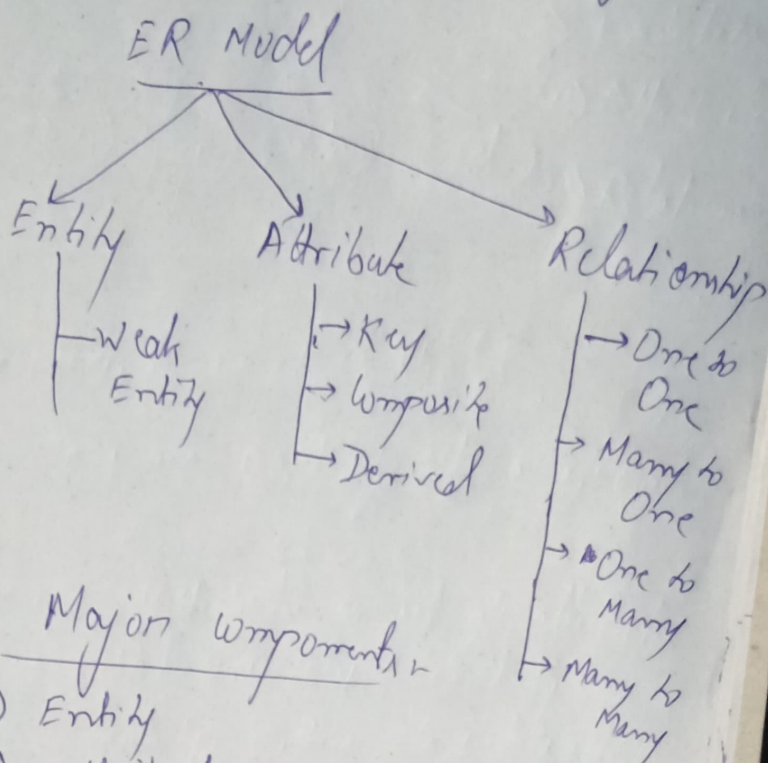
3. $YZ \rightarrow X$ && $X \rightarrow Z$
valid invalid

$\therefore YZ \rightarrow X$ && $X \rightarrow Z$ is invalid

4. $XZ \rightarrow Y$ && $Y \rightarrow Z$
invalid valid

$\therefore XZ \rightarrow Y$ && $Y \rightarrow Z$ is invalid

7. B) Components of ER-diagram



Thus Major components:

- i) Entity
- ii) Attribute
- iii) Relationship

⇒ Weak Entity set in ER-diagram are represented with double rectangle box in ER-diagram & the identifying relationships are represented with double diamond.

For

