

SE = 9/10
done = 9/10

DBMS

Class -1

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CombineCS The Extra Step

Normalization

Basic Forms

* Q1) dbms → data-structured → table → relation → Relbms ✓

semi-structured → XML ✓

unstructured → bigdata, NoSQL ✓ [7.0] MLD

Relbms

records

rows / tuples

column → attribute
or fields

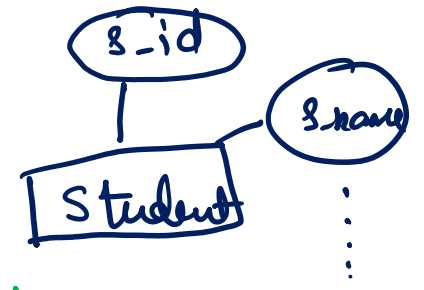
schema
table → relation
i) JOIN
ii) keys

<u>s_id</u>	<u>s_name</u>	<u>P_age</u>
r1 → 1	4	25
r2 → 2	6	30
r3 →		

rxc values

* Q3) ERD → attribute
2021

SE → SDLC
dbms → ERD
↓
Normali



ERD → Symbols
→ mapping
→ #min no. of tables

dbms

① Normalization → Tables

c-no	stud	c-name
1	Raj	C
2	Raj	C++
3	Raju	Java

Query: Tell me subject of Raj

ans: C/C++ (Anomaly)

(DML)
Insert | Update | Delete (operation)

Select c-name from table ; ans:

C
C++
Java

Q1 For each pk every row, we must have a unique record.

KVS
= NVS

Select c-name from table where stud_name = "Raj" ;

(2 record) C
C++

1NF → Table should not contain any multivalued attribute.

Q1 MCQ → properties → keyword

Q2

ERD → map → table

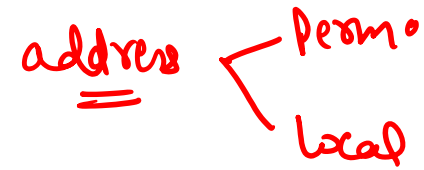
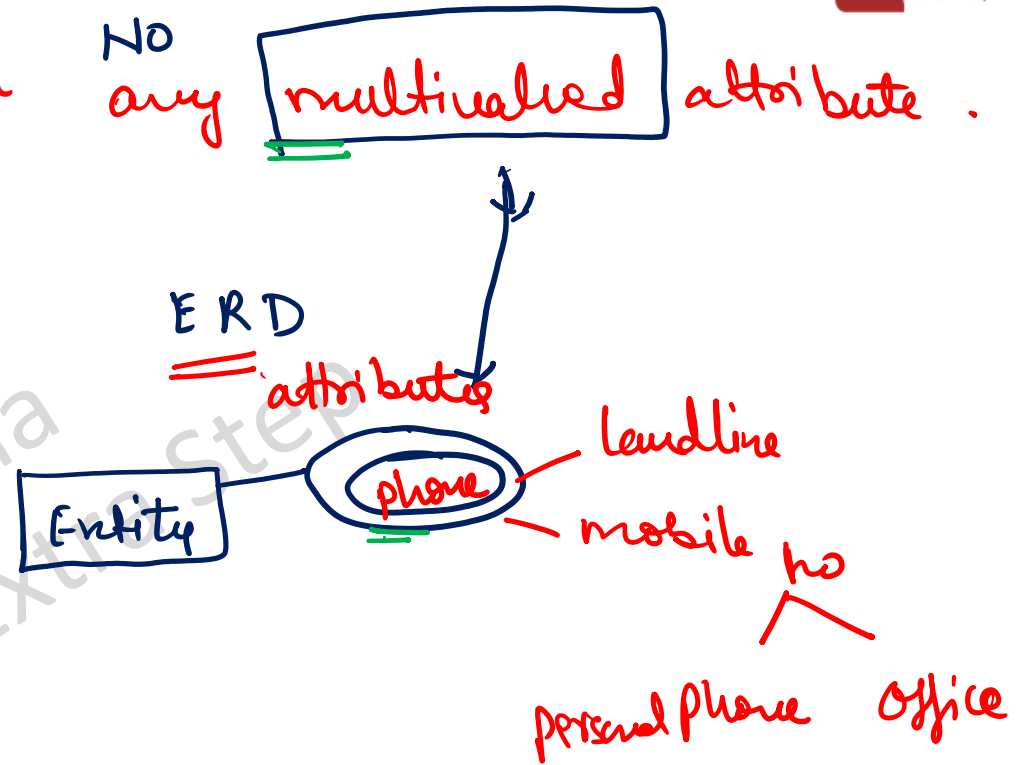
min. no. of tables

2 + 1 (multivalued)

reduce →

1	R	C
2	R	C++
3		

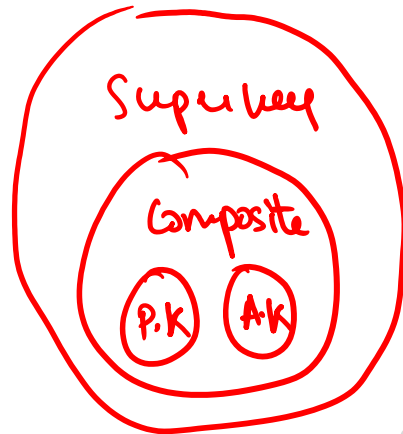
x



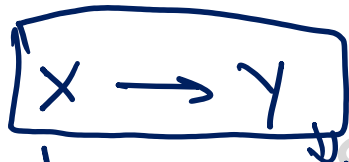
key

note

P.



FD :



determined

dependent on X

a) if X, then Y

(Discrete Math)

b) Y, if X

c) X determines Y

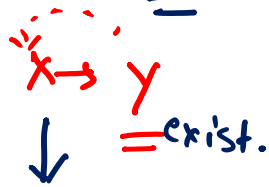
d) X implies Y

note

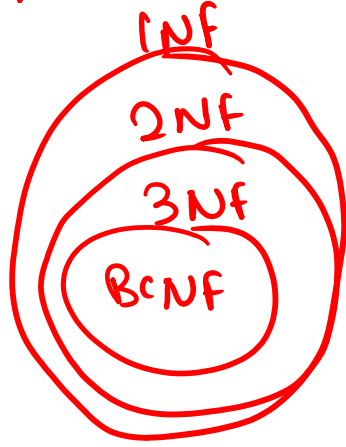
2NF → must be in 1NF.

fields/columns/properties

→ all the non-prime attributes should be fully functional dependent on Candidate key.



defn



BCNF → 3NF → 2NF → 1NF

or

if in 2NF → then not necessary it is in 3NF, BCNF, ...

imp → Referential Integrity
(constraint) (foreign key)

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Constraint (theory) → Rules → specifying creating the table.

- ① Unique → always unique
- ② Primary → It should always unique → Not null
- ③ NOT NULL → It can't be blank.
- ④ default → fees > 0 5000
- ⑤ check → age = 0 X
emp = salary = 0

or alter (DDL commands)

Syntax

```

Create table <T>
(
  id s_id int NOT NULL;
  s_name varchar(20)
  not null;

```

Constraint
P.K

Insert

sid	sname	age	fees
1	A	---	5000
2	B	---	500
3	C	---	500

→ fetch

Expected :
SQL Syntax → example
 → Application

→ key (theoretical + practical)

P.k → select . C.k → P.k

~~W.k~~ →

A.k → apart from P.k, rest keys A.k

C.k → minimal S.k

S.k → combination
or

Super set of minimal C.k

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2019 → 2020 → SQL

Q
R(A, B, C, D)
u s h r

R = Relation
A, B, C, D = attributes

Comprehension

FD 1: $AB \rightarrow CD$
FD 2: $D \rightarrow A$

L.H.S → R.H.S
 $X \rightarrow Y$

Normal form = ?

1st min

TRICK: Check R.H.S which attribute is missing?

- ① find closure⁺ → $\overline{AB}, \overline{BD}$
- ② Prime → A, B, D
- ③ Non-prime → C
- ④ Normal form

- Q1) how many closure (many) = 2 AB^+, BD^+
- Q2) minimal C.K (unique) = 2

① Minimal C.K

$A \overline{B}^+ = \{A, B, C, D\} = \{R\} = C.K$

$C \overline{B}^+ = \{B, C\} \neq \{R\} \neq C.K$

$D \overline{B}^+ = \{A, B, D, C\} = \{R\} = C.K$

~~$B \overline{B}^+ = \{B\} \neq \{R\} \neq C.K$~~

Gate

Shloony
concept

Normalize R(A, B, C, D)

- ① Table reduce →
- ② " expand →

A, B, C X
A, B, C, D, E X
Normalization violate
नॉर्मल एंजा नहीं

③ norm

Normal form

R(A, B, C, D)

1NF

2NF

3NF

BCNF

1 norm

FD 1: AB → CD

FD 2: D → A

FD 3:
FD 4:

C.k = AB +
closure = BD +

Prime	Non-Prime
A B D	C

D⁺ = { D, A } ≠ R

1.H.S → S.k | C.k | P.k

Y

N X

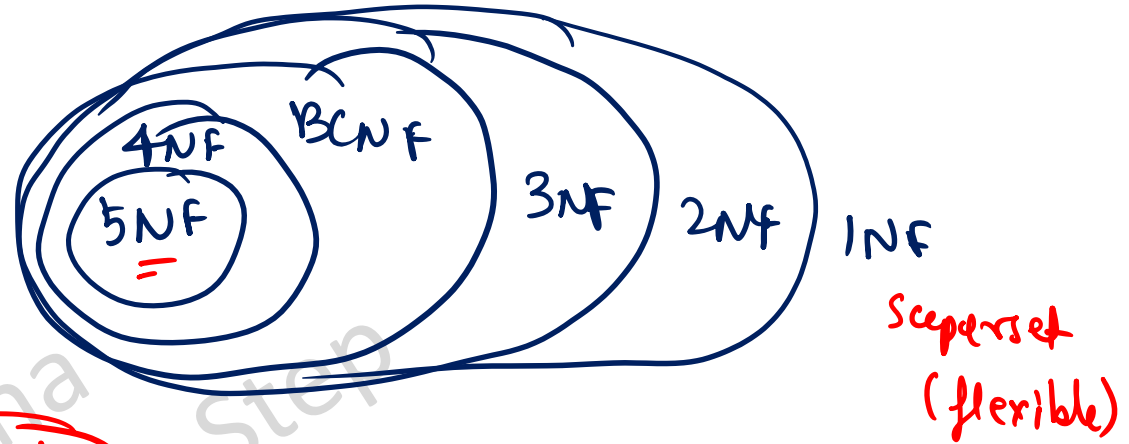
1.H.S = S.k | C.k | P.k
or

R.H.S → prime attribute

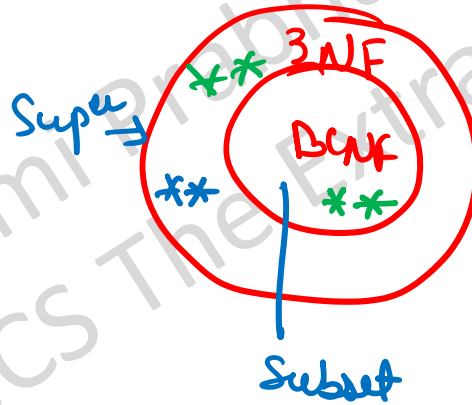
Yes
A → Prime

June 2019 Summarization

Q1 A relation is in BCNF (strongest) then it is in _____

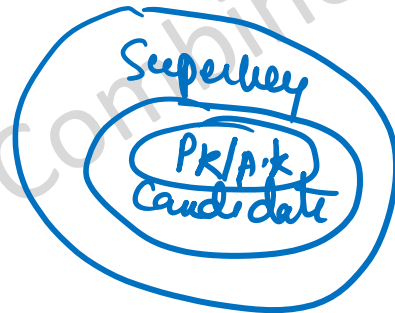


- 1) 3NF ✓
- 2) 2NF ✓
- 3) 1NF ✓
- ~~4) All~~



if BCNF \rightarrow 3NF

But if 3NF $\not\rightarrow$ BCNF



AB⁺, BD⁺ (minimal key \rightarrow C.K)

✓ AB \rightarrow P.K

✓ BD \rightarrow A.K \rightarrow Alternate key

Table structure \rightarrow A relation \rightarrow P.k unique ① address_id
 \downarrow
PAN \rightarrow duplicate \rightarrow Unique key.
No

- ① many p.k \rightarrow No
- ② Unique \rightarrow multiple \checkmark Yes

$AB^+, BD^+ \rightarrow$ minimal C.k
 $\left. \begin{matrix} ABC^+, ABD^+ \\ ABD^+, BDC^+ \end{matrix} \right\} \rightarrow$ 4 s.k

|| 2 ?

