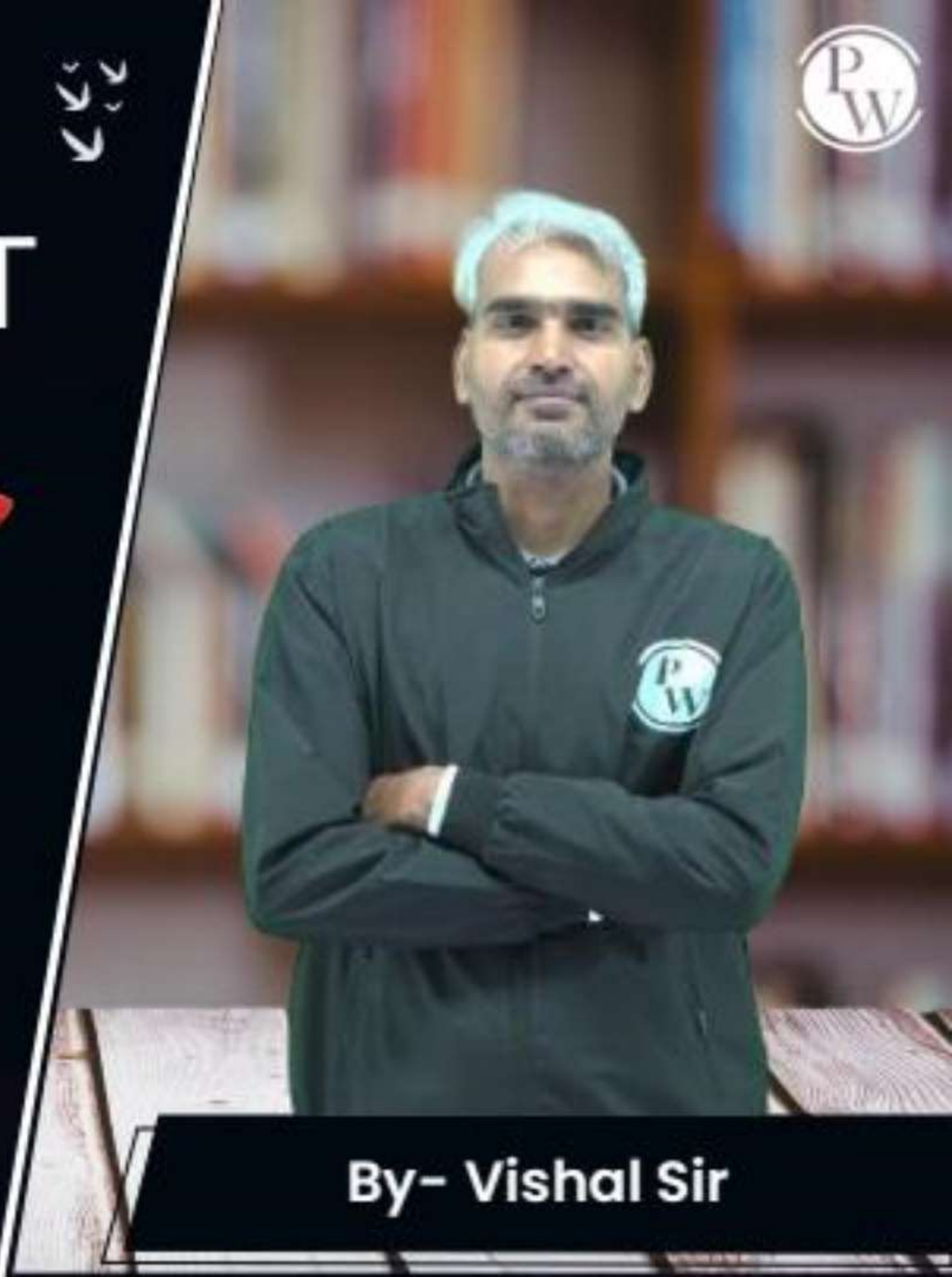
Computer Science & IT

Database Management System

Relational Model & Normal Forms

Lecture No. 02



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Recap of Previous Lecture

- Topic — Syllabus
- Topic — Introduction to DBMS
- Topic — Relational Database Model

Slide

Topics to be Covered

- Topic: Functional dependency
- Topic: Types of functional dependency
- Topic: Properties of functional dependency
- Topic: Different types of keys in RDBMS

x -> y
jab x ki value pata hogi tab y ki value bata skte hai

depedency ki info db admin dega (given hogi ye info)

Slide

instance ko dekhke dependency define nahi kr skte but dependency kha pe nahi hai ye jarur bata skte hai

Topic : Functional dependency (FD)

if $X \longrightarrow Y$

same same same

X determined Y

X is denoted by

$X \longrightarrow Y$

{Sid, Cid} → {Sname, fee}

X & Y are attribute sets from the relation

eg:

Cid → fee

Sid → Sname

{Sid, Cid} → Sname

X Y

Enroll

Sid	Sname	Cid	fee
S_1	A	C_1	500
S_2	B	C_2	700
S_3	A	C_1	500
S_4	C	C_3	400
S_1	A	C_2	700

S_1 B

X Y

{ Sid → Sname

Sname → Sid

Sid → Cid, Sid → fee

Cid → fee

Topic : Functional dependency (FD)

- Functional dependency defines the relationship between two sets of attributes in a relational table.

- It states that the values of attributes of one set (the dependent attribute set) is completely determined by the values of attributes of another set (the determinant attributes). In other words, if a determinant attribute's value is known, the value of the dependent attribute can be deduced.

In FD $X \longrightarrow Y$

X: determinant

Y: dependent

- $X \longrightarrow Y$ exists in relation R means, whenever values of attributes of set X {determinant set} is known then we can uniquely determine the values of attributes of set Y {dependent set}

Topic : Functional dependency (FD)

P only if Q
≡ if P then Q
↓
whenever if Condⁿ is true then then Condⁿ will also be true

- Let R be the relational schema with X and Y as the attribute sets over relation R.

Functional dependency X→Y exists in R only if
For all pair of tuples t1,t2∈R
If t1.X = t2.X then t1.Y = t2.Y

X → Y

If functional dependency X→y exists in R,
then,
for pair of tuples $t_1, t_2 \in R$
If $t_1.X = t_2.X$ then $t_1.y = t_2.y$

X			Y		
Att_1	Att_2	Att_3	Att_4	Att_5	Att_6
a	b	c	p	q	
a	b	c	p	q	

* Let R be a relation, and functional dependency $X \rightarrow Y$ exists in R,

then Whenever Value of X is same in any pair of tuples, then Value of Y should also be same in those tuples

Topic : Functional dependency (FD)

X	Y
x_1	y_1
x_1	y_1

[MSQ] Q: Consider the following relational instance

R

A	B	C
1	2	3
1	2	4
2	2	1
3	1	2
4	1	3

(a) $A \rightarrow C$

(b) $A \rightarrow B$

(c) $AB \rightarrow C$

(d) $BC \rightarrow A$

Which of the following functional dependencies may hold true based on given instance.

(a) $A \rightarrow C$ ✗

(b) $A \rightarrow B$

(c) $AB \rightarrow C$ ✗

(d) $BC \rightarrow A$ ✗

ye to kabhi v exist nahi kregi

2 mins Summary

- **Topic** Functional dependency
- **Topic** Types of functional dependency
- **Topic** Properties of functional dependency
- **Topic** Different types of keys in RDBMS

THANK - YOU