

Computer Science & IT

DA

Database Management System



Relational Model & Normal Forms

Lecture No. 01



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Topics to be Covered



Topic

Syllabus



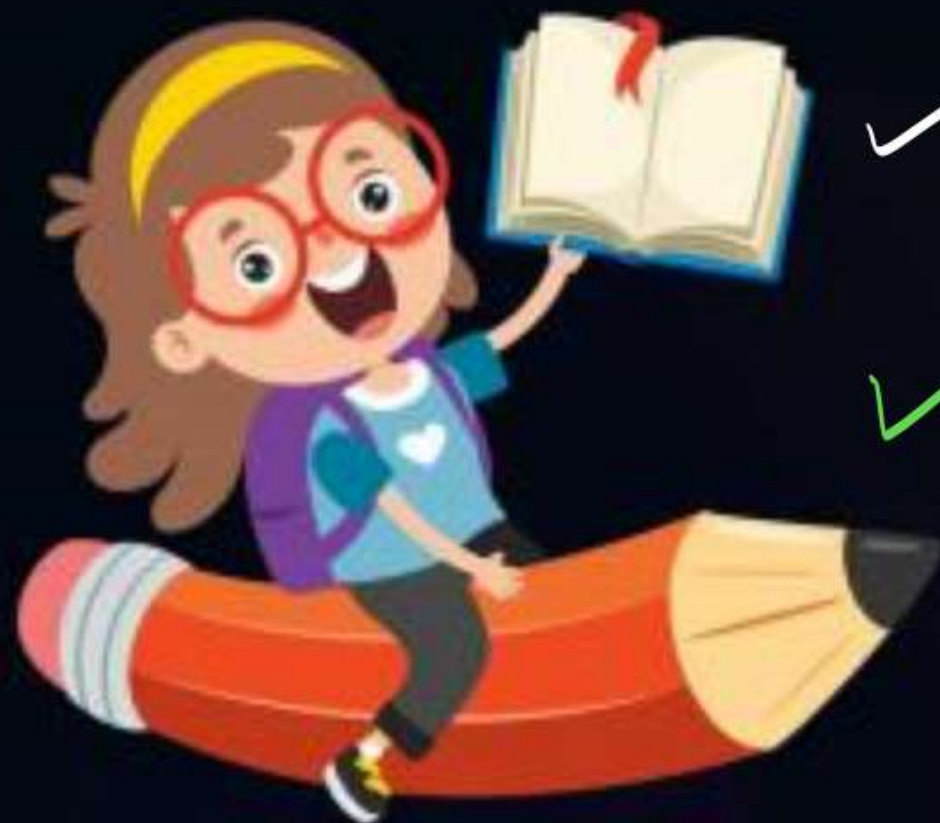
Topic

Introduction to DBMS



Topic

Relational Database Model





Topic : Syllabus

Avg. Marks
in GATE

DA → 5-7 Marks

CS → 8-10 Marks



➤ Relational Model & Normal Forms

➤ Query Languages

{ 2-3 Marks }

Maximum Practice
will be required
for this Chapter

Each
SQL + RA
questions
may take 30+
Min. while
learning

➤ Transactions and Concurrency Control

Not specified in
the syllabus of DA.

➤ File Organization & Indexing

➤ ER model



Topic : Syllabus



➤ Relational Model & Normal Forms

✓ ➤ Query Languages

➤ Transactions and Concurrency Control

➤ File Organization & Indexing

➤ ER model

Relational DB
Functional dependency
Closure of attribute set
Identification of Candidate key
Different types of Keys
Membership test
Relationship b/w FD sets
Normalization
Properties of decomposition
Lossless Join decomposition
Dependency preserving decomposition

Normal Forms
1 1NF
1 2NF
1 3NF
1 BCNF
1 4NF



Topic : Introduction to DBMS



{ it may be
raw data }

Data

eg. { 2000, 2500, }
 { 1800, 1500 }

{ Raw data may not
provide any
specific detail }

{ It is data
with meaningful
information }

Information

{ let 2000 = No. of students in Vijay
 2500 = No. of students in Parakram
 1800 = No. of students in Shreshtha
 1500 = No. of students in Super-1500 }

Information can be
organized in different
ways.

∴ There are various
types of databases

{ Database is
an organized
collection of
related information }

Database

Database Management
System

{ It is a software used
to manage & access
the database efficiently }

In this course we
will learn about
relational database
∴ information is stored in the
form of table

Above information in the form of relational database

Enrollment

other attributes

Batch	No of Students Enrolled	...
Vijay	2000	- - -
Parakrom	2500	- - -
Shreshtha	1800	- - -
Super-1500	1500	- - -

- File system can be used to manage and access the information if information stored is not huge
- File system fails to manage & access the information if database is too large.
- Database files are stored in the blocks of Secondary Memory.
- The unit of transfer b/w M.M. & Secondary Memory is 1 block.

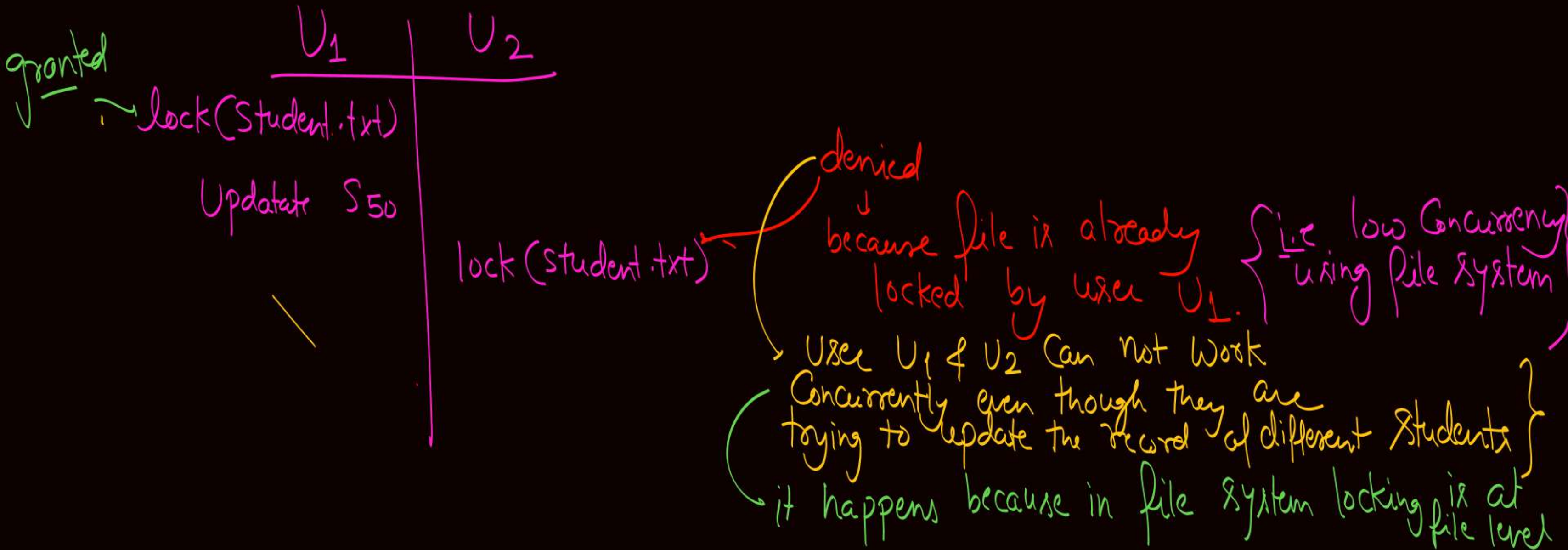
Problems faced using file system	DBMS solution for that problem
① More IO Cost	→ DBMS uses concept of Indexing to reduce the IO Cost.
② Low Concurrency (Because In file system, locking is at file level)	→ High Concurrency is achieved by performing the locking at record level.

★ IO Cost:- IO Cost of an access is the number of blocks of secondary memory that needs to be transferred to the Main memory in order to access the data corresponding to the access specified

Consider two users:-

User U_1 : Wants to update record of student S_{50}

User U_2 : Want to update record of student S_{60}



using DBMS

<u>U₁</u>	<u>U₂</u>
lock(S ₅₀)	
Update S ₅₀	lock(S ₆₀)

different records
∴ can be locked
Concurrently

Hence high Concurrency
using DBMS



2 mins Summary



Topic

Introduction to DBMS

Topic

Relational database

THANK - YOU