6th May 2021 CS301,,
DBMS End Sem

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1A) •) Using empname as clustered index is possible when every Employee will have unique name. If this is ensured, tuples will be organized according to empname alphabetically

~~Using empid as clustered index~~.

•) Using empid as clustered index is definetly possible considering everyone already has a unique id assigned to them, the Tuples will be organized according to empid.

•) Using both empname & empid as clustered indexes may not be possible but it's possible that two name one clustured index & one non-clustered index.

2A) •) representing information, external, logical schemas.

•) access and update, representing the data.

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3A) The statement "DBMS inter-leave actions of different transactions instead of executing transactions one after the other" is "TRUE."

Justification : A Database is shared among many users. Transactions from users can be interleaved to improve execution time of user's queries. By interleaving queries users don't have to wait for other user's transactions. Without interleaving, if user 'x' begins transaction that takes 15 seconds to complete & user 'y' wants to begin transaction, 'y' has to wait for an additional 15 seconds for x's transaction to complete before Database would begin y's request.

4A) a) User must guarantee that thier transaction doesn't corrupt or insert nonsense data in the Database.

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For instance, in a banking database, user must guarantee that cash withdraw transaction models amount of person removes from thier account.

b) A DBMS must guarantee transactions are fully executed & independently of other transactions. A keey feature of DBMS is that a transaction should execute atomically, also transactions will either complete fully or will be aborted, this ensures the Database remains consistent.

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5A) Yes, we can determine the key of relation with help of instance. For example, in a one to many relation we can consider column / attribute with unique values as Primary key.

6A) a) CREATE CLUSTERINDEX Empname_index
ON STUDENTTable (StudentName DESC)

SELECT Email from STUDENTTable

-> This query dispalys all emails in deccending order of student name.

b)

StudentID	StudentName	Email	Age
1005	Krishna	krishna@pgrm	22
1030	John	Null	23
1020	John	JH@xyz.com	22

7A) Query in Relational Algebra (i.e RA):

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$\rho(R_1, Catalog)$

$\rho(R_2, Catalog)$

$\Pi_{R_1.pid}(\sigma_{R_1.pid = R_2.pid \wedge R_1.sid != R_2.sid}(R_1 \times R_2))$

SQL Query:

```
SELECT DISTINCT R1.pid FROM Catalog R1,
Catalog R2 WHERE R1.pid = R2.pid AND
R1.sid != R2.sid
```

sid	pid	cost
1	1	10
2	1	9
2	3	34
3	1	11

$R_1 \times R_2$ gives us.

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Sid	pid	Cost
1	1	10
1	1	10
1	1	10
1	1	10
2	1	9
2	1	9
2	1	9
2	1	9
2	3	34
2	3	34
2	3	34
2	3	34
3	1	11
3	1	11
3	1	11
3	1	11

Sid	pid	Cost
1	1	10
2	1	9
2	3	34
3	1	11
1	1	10
2	1	9
2	3	34
3	1	11
1	1	10
2	1	9
2	3	34
3	1	11
1	1	10
2	1	9
2	3	34
3	1	11

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$\sigma_{R_1.pid = R_2.pid}$ gives

Sid	pid	cost	Sid	pid	cost
1	1	10	1	1	10
1	1	10	2	1	9
1	1	10	3	1	11
2	1	9	1	1	10
2	1	9	2	1	9
2	1	9	3	1	11
2	3	34	2	3	34
3	1	11	1	1	10
3	1	11	2	1	9
3	1	11	3	1	11

$\sigma_{R_1.pid = R_2.pid \wedge R_1.sid != R_2.sid}$ gives

Sid	pid	cost	Sid	pid	cost
1	1	10	2	1	9
1	1	10	3	1	11
2	1	9	1	1	10
2	1	9	3	1	11
3	1	11	1	1	10
3	1	11	2	1	9

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8 A) $\Pi_{Sname}(\Pi_{sid}((\sigma_{color='red'} Parts) \bowtie (\sigma_{cost<100} Catalog) \bowtie Suppliers))$

-> It's an invalid query.

Explanation: This RA statement doesn't return anything because of sequence of projection operators. Once sid is projected, it's only field in set. Therefore projecting on same will not return anything.

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9A) The view query on EMP can be updated automatically by updating:

```
CREATE VIEW SrEmp (eid, name, age, salary) AS
AS
SELECT E.eid, E.ename, E.age, E.salary
FROM Emp E
WHERE E.age > 50
```