6/5/21 CS310 DBMS
END TERM

R. MOUNIKA
19BCS124

1. Using empname as a clustered index is possible only when every employee will have a unique name. If this is ~~essent~~ ensured, the tuples will be organized according empname alphabetically

Using empid as a clustered index is definitely possible considering everyone already has a unique id assigned to them. The tuples will be organized according to empid.

Using both empname & empid as a clustered indexes may not be possible but it is possible to ~~name~~ have one clustered index and one non-clustured index.

2 DDL is important in representing information because it used to describe external and logical schemes

DML is used to access and update data, it is not important for representing the data.

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3. The given statement is TRUE

Since, a data base is typically shared among many users, transactions from the users can be interleaved to improve the execution time of queries given by the users. By interleaving queries, users don't have to wait for other users transaction to complete fully before their own transaction begins. without interleaving, if user A begin a trasaction that will take some 10 seconds to complete, and user B wants to begin a transaction, user B would have to wait an additional 10 seconds for user A's transaction to complete before the database would begin processing user B's request.

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4) a. A user must guarantee that his or her transaction doesn't corrupt data or insert nonsense in the database.

For Example, if we consider a banking database a user must guarantee that a cash withdrawal transaction accurately checks the amount removed by a person from his or her account. A database application would be worthless if a person removes some amount from ATM but the transaction set their balance to zero.

b. A DBMS must guarantee that transactions are executed fully and independently of other transactions. An essential property of a DBMS is that a transaction should get executed automically, or as if it is the only transaction running. Also, transaction will either complete fully or will be aborted and the database returned to it's initial state. This ensures that the database remains constant.

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5) Yes, we can determine the primary key of a relation with the help of instance.

For Example: In a one to many relation, we can consider the column / attribute with unique values as a primary key.

6)

```
CREATE CLUSTERED INDEX StudentName ON
    table_name (Email ASC)
```

It will create index on student name where student is table name.

Output

Email
Jhexyz.com
Krishna@pqr.com

R. MOUNIKA
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7) Query in Relational Algebra

$P(R_1, catalog)$

$P(R_2, Catalog)$

$\pi_{R_1.pid}\ \sigma\ R_1.pid = R_2.pid \wedge R_1.sid != R_2.sid$

SQL Query:

```
SELECT distinct R1.pid FROM catalog R1, catalog R2
    WHERE R1.pid = R2.pid AND R1.sid != R2.sid.
```

using the following

SID	PID	Cost
1	1	₹ 10.00
2	1	₹ 9.00
2	3	₹ 33.00
3	1	₹ 12.00

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$R_1 \times R_2$ gives us

SID	PID	Cost	SID	PID	Cost
1	1	₹ 10.00	1	1	₹ 10.00
1	1	₹ 10.00	2	1	₹ 9.00
1	1	₹ 10.00	2	3	₹ 33.00
1	1	₹ 10.00	3	1	₹ 12.00
2	1	₹ 9.00	1	1	₹ 10.00
2	1	₹ 9.00	2	1	₹ 9.00
2	1	₹ 9.00	2	3	₹ 33.00
2	1	₹ 9.00	3	1	₹ 12.00
2	3	₹ 33.00	1	1	₹ 10.00
2	3	₹ 33.00	2	1	₹ 9.00
2	3	₹ 33.00	2	3	₹ 33.00
2	3	₹ 33.00	3	1	₹ 12.00
3	1	₹ 12.00	1	1	₹ 10.00
3	1	₹ 12.00	2	1	₹ 9.00
3	1	₹ 12.00	2	3	₹ 33.00
3	1	₹ 12.00	3	1	₹ 12.00

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

SID	PID	Cost	SID	PID	Cost
1	1	₹ 10.00	1	1	₹ 10.00
1	1	₹ 10.00	2	1	₹ 9.00
1	1	₹ 10.00	3	1	₹ 12.00
2	1	₹ 9.00	1	1	₹ 10.00
2	1	₹ 9.00	2	1	₹ 9.00
2	1	₹ 9.00	3	1	₹ 12.00
2	3	₹ 33.00	2	3	₹ 33.00
3	1	₹ 12.00	1	1	₹ 10.00
3	1	₹ 12.00	2	1	₹ 9.00
3	1	₹ 12.00	3	1	₹ 12.00

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

SID	PID	Cost	SID	PID	Cost
1	1	₹10.00	2	1	₹9.00
1	1	₹ 10.00	3	1	₹ 12.00
2	1	₹9.00	1	1	₹ 10.00
2	1	₹9.00	3	1	₹ 12.00
3	1	₹12.00	1	1	₹10.00
3	1	₹12.00	2	1	₹9.00

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8). The given query is a invalid query.

Explaination: The relational algebra statement doesn't return anything because of the sequency of projection operators. Once, the sid is projected, it is the only field in the set.

Therefore, projecting on same will not return anything.

R. MOUNIKA
19BCS124

9) Emp

eid	ename	age	salary

Works

eid	did	pct time

Dept.

did	budget	managerid

The following view on Emp can be updated automatically by updating Emp:

```
CREATE VIEW Soremp (eid,ename, age , salary)
AS   SELECT  E.eid , E.ename, E.age, E.salary
     FROM  Emp E  WHERE  E.age > 45
```