CS310 - DBMS - END SEM

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1.) The company XYZ intends to store its employee data in a heap file with a clustered index on the empname field. It is to be noted that a heap is a table with no clustered indices. Data is stored without specifying any order to store the low efficiently

Thus, it is not possible to store data in a heap file with a clustered index on a field.

Alternately, it is completely possible to store the data with an index on enpid field because it eventually becomes a primary index and thus, non clustered indices are allowed in a heap files.

2.) (a.) DDL is important in Representing information in DBMS because it is used to describe it is used to describe external and logical schemes

(b.) DML is used to modify and Manipulate data; it is not important for Representing the data.

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3.) A DBMS is typically shared among many users. Transactions from these users can be interleaved to improved the execution time of user's queries. By interleaving queries, users do not have to wait for other user's transactions to complete fully before their own transaction begins. Without interleaving, if user A begins a transaction that will take 10 seconds to complete, and user B wants to begin a transaction, user B have to wait an addictional 10 sec's for user A's transaction to complete before the database would begin processing user's B's request.

So, it is **TRUE** that DBMS interleave the actions of different transactions instead of executing transactions one after another.

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4.) (a.) A user must guarantee that his or her transaction does not corrupt data or insert nonsense in the database.

For Example, in a banking database, a user must guarantee that a cash with draw transactions accurately models the amount a person removes from his or her account. A database application would be worthless if a person removed Rs. 1500/- from an ATM but the transaction set their balance to zero.

(b.) A DBMS must guarantee that transaction are executed fully and independently of other transactions An essential properly of a DBMS is that a transaction should execute automatically, or as if it is the only transaction running. Also, transiactions will either complete fully, or will be aborted and the database returned to its initial state. This ensures that the database remains consistent.

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5.) Yes, we can determine the key of relation with the help of instance. Eg: In a one to many relation we can consider the column / attribute with unique values as a primary key.

6.) (a.) Create clustered index Ix_empname_index ON STUDENT Table (Student Name DESC)

" Select Email from STUDENT Table "

This query displays all the Emails in the descending order of the Student Name. First the table gets sorted based on student name in DESC order then the select query displays the emails in that order.

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6.) (b.)

Student ID	Student Name	Email	Age
1005	Krishna	krishna@pqr.com	22
1030	John	Null	23
1020	John	Jh@xyz.com	22

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7.) Find the pids of parts supplied by at least two different suppliers.

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ρ(R1, Catalog)

ρ(R2, Catalog)

$\pi_{R1.pid}\, \sigma_{R1.pid = R_2.Pid \wedge R1.sid != R_2.sid} (R1 \times R_2)$

using the following:

SID	PID	Cost
1	1	$10.00
2	1	$9.00
2	3	$34.00
3	1	$11.00

* RA

ρ(R1, catalog)

ρ(R2, catalog)

$\pi_{R1.pid}\, \sigma_{R1.Pid = R2.Pid \wedge R1.sid6 = R2.sid} (R1 \times R_2)$

SQL:

```
SELECT c.sid
FROM Catalog c
WHERE ~~c1.Pid~~ EXISTS (SELECT c1.sid FROM Catalog c1
WHERE c1.Pid = C.pid AND c1.sid6 = c.sid)
```

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R1 x R2 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	$ 34.00
1	1	$ 10.00	3	1	$ 11.00
2	1	$ 9.00	1	1	$ 10.00
2	1	$ 9.00	2	1	$ 9.00
2	1	$ 9.00	2	3	$ 34.00
2	1	$ 9.00	3	1	$ 11.00
2	3	$ 34.00	1	1	$ 10.00
2	3	$ 34.00	2	1	$ 9.00
2	3	$ 34.00	2	3	$ 34.00
2	3	$ 34.00	3	1	$ 11.00
3	1	$ 11.00	1	1	$ 10.00
3	1	$ 11.00	2	1	$ 9.00
3	1	$ 11.00	2	3	$ 34.00
3	1	$ 11.00	3	1	$ 11.00

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$\sigma_{R1.Pid = R2.Pid}$ 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	$ 11.00
2	1	$ 9.00	1	1	$ 10.00
2	1	$ 9.00	2	1	$ 9.00
2	1	$ 9.00	3	1	$ 11.00
2	3	$ 34.00	2	3	$ 34.00
3	1	$ 11.00	1	1	$ 10.00
3	1	$ 11.00	2	1	$ 9.00
3	1	$ 11.00	3	1	$ 11.00

$\sigma_{R1.Pid = R2.pid \wedge R1.sid != R2.Sid}$ gives us:

SID	PID	Cost	SID	PID	Cost
1	1	$ 10.00	2	1	$ 9.00
1	1	$ 10.00	3	1	$ 11.00
2	1	$ 9.00	1	1	$ 10.00
2	1	$ 9.00	3	1	$ 11.00
3	1	$ 11.00	1	1	$ 10.00
3	1	$ 11.00	2	1	$ 9.00

Projecting on PID gives us a single part number - 1 (eliminating the duplicates)

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8.) Invalid query.

Explanation: This relational algebra statement does not return anything because of the sequence of projection operators. Once the sid is projected, it is the only field in the set. Therefore, projecting on some will not return anything.

9.) The query on EMP schema that could be automatically updated by updating EMP is

```
CREATE VIEW senior EMP (eid, ename, age, salary)
AS SELECT E.eid, E.ename, E.age, E.salary.
From Emp E
WHERE E.age > 50.
```

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