

End Term Examination

CS310 - DBMS

Date = 06/05/21

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Name = Deepthi P. Ranjithan
Reg. no. = 19BC5037

- ① • Using empname as a clustered index is possible only when employee will leave a unique name. If this is 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 clustered indexes may not be possible but it is possible to have one clustered index and one non-clustered index.

② a) DDL is important Representing Information in DBMS because it is used to describe External and logical schemes.

b) DML is used to access and update data; it is not important for representing the data.

③ a) DDL is important Representing Information in DBMS because it is used to describe External and logical schemes.

b) Access, update data, repres representing the data

(23) It's True.

A DBMS is typically shared among many users. Transactions from these users can be interleaved to improve the execution time of users 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 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. So This was the justification for DBMS interleaves the actions of different transactions instead of executing transactions one after the other.

(34)

- 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 withdrawal transaction accurately models the amount a person removes from his/her account. A database application would be worthless if a person removed 20\$ from a ATM but the transaction set their balance is 01.
- b) A DBMS must guarantee that transactions are executed fully and independently of others.

Name = Deepthi. P. Ranjolkar

Roll no = 19BCS037

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Transactions. An essential property of a DBMS is that a transaction should execute automatically, or as if it is the only transaction running. Also, transaction will either complete fully, or will be aborted and the database returned to its initial state. This ensures that the database remains consistent.

Q (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.

Name: Deepak R Ranjolkar
Roll. no: 19BCSO37

(5) PCR_1 (catalog)
 PCR_2 (catalog)

$$\pi_{R_1.pid \in R_1.pid = R_2.pid \wedge R_1.sid = R_2.sid} (R_1 \times R_2)$$

Using the following:

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

$R_1 \times R_2$ 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	\$ 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

Name = Deepthi, P. Ranjolkur
Roll no = 19BCSO37

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○ $R_1 \text{ pid} = R_2 \text{ pid}$ 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

○ $R_1 \text{ pid} = R_2 \text{ pid} \wedge R_1 \text{ sid} = R_2 \text{ sid}$ 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	\$ 10.11
2	1	\$ 9.00	3	1	\$ 11.00
3	1	\$ 11.00	1	1	\$ 10.00
3	1	\$ 11.00	2	1	\$ 9.00

→ SQL:-

```

SELECT C.sid
FROM catalog C
WHERE EXISTS (
    SELECT C1.sid
    FROM catalog C1
    WHERE C1.pid = C.pid AND
          C1.sid ≠ C.sid
)

```

⑧ Invalid query

→ 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. ∴ projecting on same will not return anything.

⑨

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

```

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

```