

1) In given question ,

Using empname as a clustered index, is possible only when every employee will have a unique name. If this is ensured, the tuples will be organized according to 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 accordingly to Empid.

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

2). DDL is important in Representing information in DBMS because it is used to describe.

External and Logical Schemas

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

- 3) True. As a DBMS is typically shared among many users. Transactions from these users can be interleaved to improve 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 which takes 5 seconds to complete, and if user B wants to begin a transaction, user B would have to wait an additional 5 seconds for user A's transaction to complete before database will process user B's request.

4).

a). A user must guarantee that his or her transaction does not corrupt data or insert unwanted waste in the database. For example, in a banking database, a user must guarantee that a withdraw transaction correctly models the amount he/she withdrawn from their account. If a person removed ₹50,000/- from their account but the transaction set their balance to zero, then the database is worthless.

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

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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.

7). Relational Algebra.

$P(R_1, \text{catalog})$

$P(R_2, \text{catalog})$

~~$\pi_{R_1 \cdot \text{pid} \sigma_{R_1 \cdot \text{pid} = R_2 \cdot \text{pid} \wedge R_1 \cdot \text{sid}}}$~~

$\pi_{R_1 \cdot \text{pid}} \sigma_{R_1 \cdot \text{pid} = R_2 \cdot \text{pid} \wedge R_1 \cdot \text{sid} \neq R_2 \cdot \text{sid}} (R_1 \times R_2),$

SQL :-

SELECT C.sid

FROM catalog C.

WHERE EXISTS (SELECT C1.sid FROM catalog C1

WHERE C1.pid = C.pid AND.

C1.sid \neq C.sid).

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 same will not return anything.