

DBMS ENDSEM

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15Q1:- Yes it is possible to do all the above operations in DBMS. The above given question data is an example of physical data independence. We can use the concepts of indexing for the above statement. A clustered index can be created on the empname field. The SQL command would be like.

```
CREATE CLUSTERED INDEX IX-index-name ON  
table-name (empname ASC)
```

We can also create clustered index on empid. The command would be like.

```
Create CLUSTERED INDEX IX-index-name ON  
table-name (empid ASC)
```

or we can make the empid as primary key then an index gets created on it by default.

They can also create indexes on two fields like -

```
"CREATE CLUSTERED INDEX IX-index-name ON  
Table-name (empname DESC empid ASC)";
```

They could also store as a file sorted on attribute empid ~~using~~ by using the "ORDER BY" clause. It would be similar to

```
"Select * from Table_name order by empid";
```

(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.

Ans :- A DBMS is a 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 inter-leaving if user A begins a transaction that will take 10 seconds to complete and 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 answer is True.

4. A user must guarantee his (her) transaction
(a) does not corrupt data or insert nonsense in the database, a user must guarantee that a cash withdrawal transaction accurately models the amount a person removes from his or her account. A database application would be worthless if a person removed 20 dollars from an 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 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 the database remains consistent.

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

(6) CREATE clustered index IX-emailname - index ON
STUDENTTABLE (StudentName DESC)

"Select email from StudentTable"

this query display all the emails in the
descending order of the StudentName. First
table gets sorted based on student name in DESC
order then select query displays the emails in
that order.

St-Id	St-Name	Email	Age
1005	Krishna	Krishna@pqr.com	22
1030	John	john	23
1020	John	Jh@xyz.com	22

(7) Query in Relational Algebra

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

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

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

SQL Query :-

Select distinct $R_1 \cdot \text{pid}$ from catalog R_2 .

catalog R_2 where $R_1 \cdot \text{pid} = R_2 \cdot \text{pid}$ and

$$R_1 \cdot \text{sid} \neq R_2 \cdot \text{sid}$$

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

$R_1 \times R_2$ gives us :-

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

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

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
3	1	11			

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

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

(8) $\pi_{sname}(\pi_{sid}(\sigma_{color = 'red'}(parts)) * (\sigma_{cost < 100}(catalog)) * suppliers))$

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 something 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 eid, E.ename, E.age, E.salary FROM Emp E
WHERE E.age > 50.
```