# DBMS - End Term

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3] 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 that will be 10 seconds to complete, and user B wants to begin a transaction, user B would have to wait an additional 10 seconds for users 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 does not corrupt data or insert nonsense in the database. for the example, in a banking database, a user must guarantee that a cash withdraw 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 automically or as if it is only transaction running. Also transactions will either complete fully, or will be aborted and the database returned to it's initial state. This ensures that the database remains consistent.

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1] 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.
```

2] * DDL is important in representing information 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.

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7] $P(R_1, catalog)$

$P(R_2, catalog)$

$T_1\ R_1.pid\ \sigma R_1.pid = R2.pid\ \pi R_1.sid, R_2.sid\ (R_1 \times R_2)$

Using the following

| SID | RID | cost |
|---|---|---|
| 1 | 1 | $10.00 |
| 2 | 1 | $9.00 |
| 2 | 3 | $34.00 |
| 3 | 1 | $11.00 |

$R_1 \times R_2$ gives :-

| 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 | 3 | 3 | $34.00 |
| 2 | 3 | $34.00 | 1 | 1 | $11.00 |
| 3 | 1 | $11.00 | 2 | 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 |

OR, pid = R2 pid gives :-

| SID | PID | Cost | SID | PID | Cost |
|---|---|---|---|---|---|
| 1 | 1 | $10.00 | 1 | 1 | $10.00 |
| 1 | 2 | $10.00 | 2 | 1 | $10.00 |
| 1 | 3 | $10.00 | 3 | 1 | $10.00 |
| 2 | 1 | $9.00 | 1 | 1 | $9.00 |
| 2 | 2 | $8.00 | 2 | 1 | $9.00 |
| 2 | 3 | $9.00 | 3 | 1 | $11.00 |
| 3 | 1 | $34.00 | 2 | 3 | $34.00 |
| 3 | 2 | $11.00 | 1 | 1 | $10.00 |
| 3 | 3 | $11.00 | 2 | 1 | $9.00 |
| | | | 3 | 1 | $11.00 |

$\sigma$ R, P/d = R2 pid $\wedge$ B, SID != R2 gives :-

| 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 (eleminating the duplicates)

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1] *. 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 empname alphatially.

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

*. using both the empname & empid as clustered index may not be possible but it is possible two have one clustered index and one non-clustered index.

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8] Invalid query

Explanation:- This relational algebra statements 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.