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Subject:	ADBMS
Section:	622-B

Ans 4.3:

Code:

```
CREATE TABLE StudentEnrollments (
student_id INT PRIMARY KEY,
student_name VARCHAR(100),
course_id VARCHAR(10),
enrollment_date DATE
);
INSERT INTO StudentEnrollments (student_id, student_name, course_id, enrollment_date)
VALUES
(1, 'Ashish', 'CSE101', '2024-06-01'),
```

```
(2, 'Smaran', 'CSE102', '2024-06-01'),
(3, 'Vaibhav', 'CSE103', '2024-06-01');
#Part A
START TRANSACTION;

-- Step 1: Lock row with student_id = 1
UPDATE StudentEnrollments
SET course_id = 'CSE201'
WHERE student_id = 1;

-- Step 2: Later tries to lock student_id = 2
UPDATE StudentEnrollments
SET course_id = 'CSE301'
WHERE student_id = 2;
#Part B
START TRANSACTION;

-- Step 1: Lock row with student_id = 2
UPDATE StudentEnrollments
SET course_id = 'CSE202'
WHERE student_id = 2;

-- Step 2: Later tries to lock student_id = 1
UPDATE StudentEnrollments
SET course_id = 'CSE302'
WHERE student_id = 1;
```

#Part B: Applying MVCC to Prevent Conflicts

--Transaction 1 (User A - Reader)

START TRANSACTION ISOLATION LEVEL REPEATABLE READ;

-- Reads snapshot data

SELECT student_id, student_name, course_id, enrollment_date

FROM StudentEnrollments

WHERE student_id = 1;

--**Transaction 2 (User B - Writer)**

START TRANSACTION;

-- Updates same row

UPDATE StudentEnrollments

SET enrollment_date = '2024-07-10'

WHERE student_id = 1;

COMMIT;

Part C: Comparing Locking vs MVCC

START TRANSACTION;

SELECT * FROM StudentEnrollments WHERE student_id = 1 FOR UPDATE;

UPDATE StudentEnrollments

SET course_id = 'CSE401'

WHERE student_id = 1;

START TRANSACTION;

SELECT * FROM StudentEnrollments WHERE student_id = 1;

-- This is BLOCKED until T1 commits

Scenario 2: MVCC (Snapshot Isolation)

Transaction 1 (Writer):

START TRANSACTION;

UPDATE StudentEnrollments

SET course_id = 'CSE402'

WHERE student_id = 1;

-- Not committed yet

Transaction 2 (Reader):

START TRANSACTION ISOLATION LEVEL REPEATABLE READ;

SELECT * FROM StudentEnrollments WHERE student_id = 1;

Output:
(A)

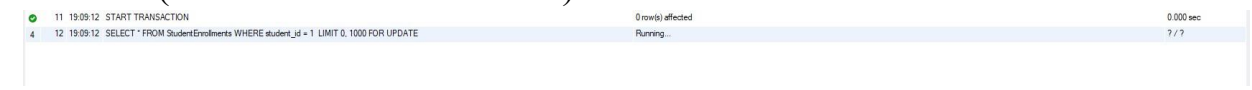
The error "Lost connection to MySQL server during query" occurs because Tab 1 tried to update a row that was already locked by Tab 2.

PART B:

PART C:

Scenario 1

Session A (Transaction 1 - Locks row)



Scenario 2

Session A(Writer)

Session B(reader)