

|         |            |
|---------|------------|
| NAME    | AVINASH    |
| UID     | 23BCS13252 |
| CLASS   | 622-A      |
| SUBJECT | ADBMS      |

**Part A: Prevent Duplicate Enrollments Using Locking**

**Part B: Use SELECT FOR UPDATE to Lock Student Record**

**Part C: Demonstrate Locking Preserving Consistency in Concurrent Transactions**

**CODE:**

**DROP TABLE IF EXISTS StudentEnrollments;**

```
CREATE TABLE StudentEnrollments (
    enrollment_id INT PRIMARY KEY,
    student_name VARCHAR(100) NOT NULL,
    course_id VARCHAR(10) NOT NULL,
    enrollment_date DATE NOT NULL,
    CONSTRAINT unique_student_course UNIQUE (student_name, course_id)
);
```

**START TRANSACTION;**

**INSERT INTO StudentEnrollments VALUES (1, 'Ashish', 'CSE101', '2024-07-01');**

**INSERT INTO StudentEnrollments VALUES (2, 'Smaran', 'CSE102', '2024-07-01');**

**INSERT INTO StudentEnrollments VALUES (3, 'Vaibhav', 'CSE101', '2024-07-01');**

**COMMIT;**

**START TRANSACTION;**

**INSERT INTO StudentEnrollments VALUES (4, 'Ashish', 'CSE101', '2024-07-02');**

**ROLLBACK;**

**START TRANSACTION;**

**SELECT \* FROM StudentEnrollments**

**WHERE student\_name = 'Ashish' AND course\_id = 'CSE101'**

**FOR UPDATE;**

**START TRANSACTION;**

**INSERT INTO StudentEnrollments VALUES (4, 'Ashish', 'CSE101', '2024-07-02');**

**COMMIT;**

**START TRANSACTION;**

**SELECT \* FROM StudentEnrollments**

**WHERE student\_name = 'Ashish' AND course\_id = 'CSE101'**

**FOR UPDATE;**

**START TRANSACTION;**

**SELECT \* FROM StudentEnrollments**

**WHERE student\_name = 'Ashish' AND course\_id = 'CSE101'**

**FOR UPDATE;**

**UPDATE StudentEnrollments**

**SET enrollment\_date = '2024-07-10'**

**WHERE student\_name = 'Ashish' AND course\_id = 'CSE101';**

**COMMIT;**

**START TRANSACTION;**

**UPDATE StudentEnrollments**

**SET enrollment\_date = '2024-07-15'**

**WHERE student\_name = 'Ashish' AND course\_id = 'CSE101';**

**COMMIT;**

**SELECT \* FROM StudentEnrollments**

| enrollment_id | student_name | course_id | enrollment_date          |
|---------------|--------------|-----------|--------------------------|
| 2             | Smaran       | CSE102    | 2024-07-01T00:00:00.000Z |
| 3             | Vaibhav      | CSE101    | 2024-07-01T00:00:00.000Z |
| 4             | Ashish       | CSE101    | 2024-07-15T00:00:00.000Z |