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Ans 4.2:

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)
    -- ensures uniqueness
) ENGINE=InnoDB;
```

```
INSERT INTO StudentEnrollments VALUES
```

```
(1, 'Ashish', 'CSE101', '2024-07-01'),
```

```
(2, 'Smaran', 'CSE102', '2024-07-01'),
```

```
(3, 'Vaibhav', 'CSE101', '2024-07-01');
```

```
-- Part A
```

```
START TRANSACTION;
```

```
INSERT INTO StudentEnrollments VALUES (4, 'Ashish', 'CSE101', '202407-02'); -- duplicate
```

```
COMMIT;
```

```
--PART B
```

```
--USER A
```

```
START TRANSACTION;
```

```
SELECT * FROM StudentEnrollments
```

```
WHERE student_name = 'Ashish' AND course_id = 'CSE101'
```

```
FOR UPDATE;
```

```
--user B
```

```
START TRANSACTION;
```

```
UPDATE StudentEnrollments
```

```
SET enrollment_date = '2024-07-05'
```

```
WHERE student_name = 'Ashish' AND course_id = 'CSE101';
```

```
COMMIT;
```

```
-- Now User B's query executes and updates the row.
```

```
COMMIT;
```

```
SELECT * FROM StudentEnrollments;
```

--PART C

--USER A

START TRANSACTION;

UPDATE StudentEnrollments

SET enrollment_date = '2024-07-10'

WHERE enrollment_id = 1;

-- Not committed yet

--USER B

UPDATE StudentEnrollments

SET enrollment_date = '2024-07-15'

WHERE enrollment_id = 1;

COMMIT;

SELECT * FROM StudentEnrollments WHERE enrollment_id = 1

START TRANSACTION;

SELECT * FROM StudentEnrollments WHERE enrollment_id = 1 FOR
UPDATE;

UPDATE StudentEnrollments

SET enrollment_date = '2024-07-20'

WHERE enrollment_id = 1;

-- Keep open

-- User B tries to update (will be blocked until A commits):

UPDATE StudentEnrollments

```
SET enrollment_date = '2024-07-25'
```

```
WHERE enrollment_id = 1;
```

```
-- When User A commits:
```

```
COMMIT;
```

```
-- Now User B executes
```

```
COMMIT;
```

```
-- Final state remains consistent:
```

```
SELECT * FROM StudentEnrollments WHERE enrollment_id = 1;
```

(a) PART A

```
Error: Duplicate entry 'Ashish-CSE101' for key 'studentenrollments.unique_student_course'
```

(b) PART B

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

(c) PART C

enrollment_id	student_name	course_id	enrollment_date
1	Ashish	CSE101	2024-07-25T00:00:00.000Z