DBMS LAB

ASSIGNMENT – 3

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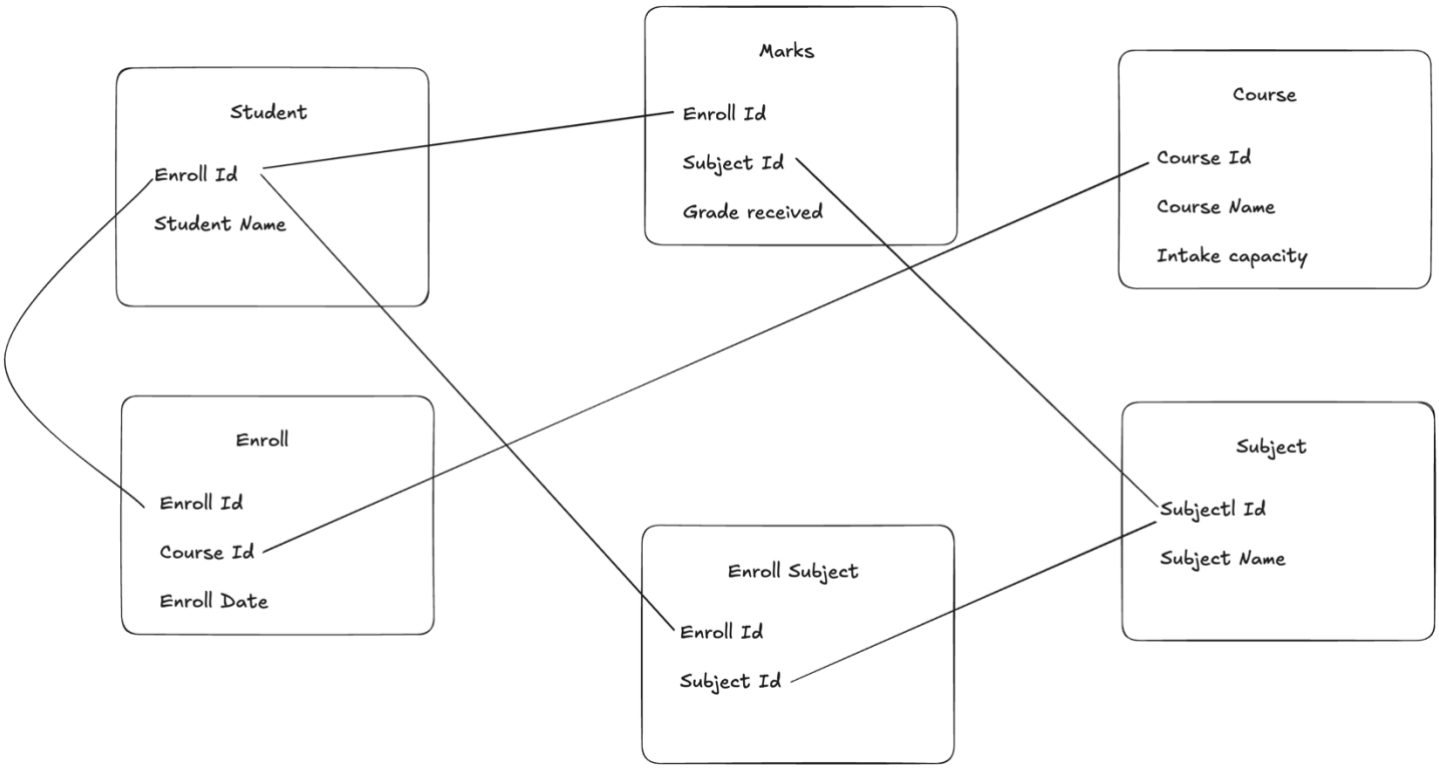
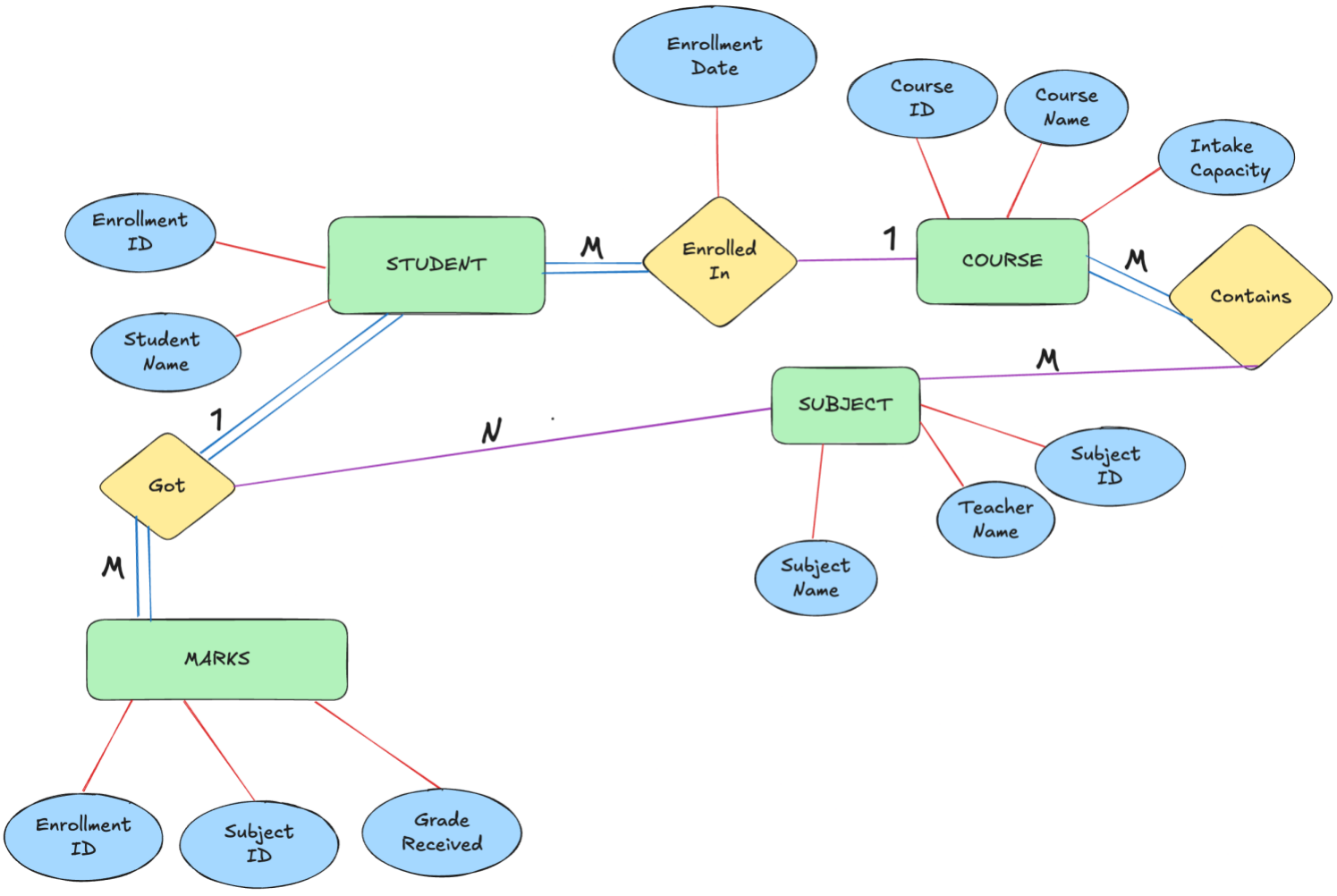
In an educational institute, various numbers of courses are offered. In each course, 7 numbers of subjects are taught. One student can select minimum 5 and maximum 6 numbers of subjects for that course. Each course has maximum intake capacity. The same subject may be taught in various courses. The system must be able to handle course, subject, student, marks grade and enrolment information. Assumptions also can be made. Design an ER diagram and database schema for the system. Specify the primary key, foreign key and other constraints for all required tables. Draw the ER diagram.

Database Schema



ER DIAGRAM


Enrollment Date
Course ID
Course Name
Intake Capacity
Enrollment ID
STUDENT
M
Enrolled In
1
COURSE
M
Contains
Student Name
M
SUBJECT
1
N
Got
Subject ID
Teacher Name
Subject Name
M
MARKS
Enrollment ID
Subject ID
Grade Received

Question and Answers

Q1.) Insert at least five tuples in each table.

```
CREATE TABLE STUDENT (
    enroll_id NUMBER PRIMARY KEY,
    student_name VARCHAR2(100) NOT NULL
);
CREATE TABLE COURSE (
    course_id NUMBER PRIMARY KEY,
    course_name VARCHAR2(100) NOT NULL,
    intake_capacity NUMBER
);
CREATE TABLE SUBJECT (
    subject_id NUMBER PRIMARY KEY,
    subject_name VARCHAR2(100) NOT NULL,
    teacher_name VARCHAR2(100)
);
CREATE TABLE ENROLL (
    enroll_id NUMBER PRIMARY KEY,
    course_id NUMBER,
    enroll_date DATE,
    FOREIGN KEY (enroll_id) REFERENCES STUDENT(enroll_id),
    FOREIGN KEY (course_id) REFERENCES COURSE(course_id)
);
CREATE TABLE MARKS (
    marks_id NUMBER PRIMARY KEY,
    enroll_id NUMBER,
    subject_id NUMBER,
    grade CHAR(1),
    FOREIGN KEY (enroll_id) REFERENCES STUDENT(enroll_id),
    FOREIGN KEY (subject_id) REFERENCES SUBJECT(subject_id)
);
CREATE TABLE ENROLL_SUBJECT (
    enroll_id NUMBER,
    subject_id NUMBER,
    PRIMARY KEY (enroll_id, subject_id),
    FOREIGN KEY (enroll_id) REFERENCES ENROLL(enroll_id),
```

```
    FOREIGN KEY (subject_id) REFERENCES SUBJECT(subject_id)
);

INSERT INTO STUDENT (enroll_id, student_name) VALUES (1, 'Lana Del Ray');
INSERT INTO STUDENT (enroll_id, student_name) VALUES (2, 'Ellie
Goulding');
INSERT INTO STUDENT (enroll_id, student_name) VALUES (3, 'Taylor Swift');
INSERT INTO STUDENT (enroll_id, student_name) VALUES (4, 'Halsey');
INSERT INTO STUDENT (enroll_id, student_name) VALUES (5, 'Tate McRae');
INSERT INTO STUDENT (enroll_id, student_name) VALUES (6, 'Juice Wrld');
INSERT INTO STUDENT (enroll_id, student_name) VALUES (7, 'NF');
INSERT INTO STUDENT (enroll_id, student_name) VALUES (8, 'Eminem');
INSERT INTO STUDENT (enroll_id, student_name) VALUES (9, 'Weeknd');
INSERT INTO STUDENT (enroll_id, student_name) VALUES (10, 'Kendrick');

INSERT INTO COURSE (course_id, course_name, intake_capacity) VALUES (10,
'IT', 50);
INSERT INTO COURSE (course_id, course_name, intake_capacity) VALUES (20,
'Instru', 40);
INSERT INTO COURSE (course_id, course_name, intake_capacity) VALUES (30,
'Mech', 30);
INSERT INTO COURSE (course_id, course_name, intake_capacity) VALUES (40,
'ECE', 20);
INSERT INTO COURSE (course_id, course_name, intake_capacity) VALUES (50,
'CSE', 25);
INSERT INTO COURSE (course_id, course_name, intake_capacity) VALUES (60,
'Elec', 25);
INSERT INTO COURSE (course_id, course_name, intake_capacity) VALUES (70,
'M&C', 50);

INSERT INTO SUBJECT (subject_id, subject_name, teacher_name) VALUES (101,
'DSA', 'Prof. X');
INSERT INTO SUBJECT (subject_id, subject_name, teacher_name) VALUES (102,
'DBMS', 'Prof. Y');
INSERT INTO SUBJECT (subject_id, subject_name, teacher_name) VALUES (103,
'COA','Prof . Z');
INSERT INTO SUBJECT (subject_id, subject_name, teacher_name) VALUES (104,
'OOPS', 'Prof. A');
INSERT INTO SUBJECT (subject_id, subject_name, teacher_name) VALUES (105,
'OS', 'Prof. B');
```

```
INSERT INTO ENROLL (enroll_id, course_id, enroll_date) VALUES (1, 10,
TO_DATE('2024-09-01', 'YYYY-MM-DD'));
INSERT INTO ENROLL (enroll_id, course_id, enroll_date) VALUES (2, 20,
TO_DATE('2024-09-02', 'YYYY-MM-DD'));
INSERT INTO ENROLL (enroll_id, course_id, enroll_date) VALUES (3, 30,
TO_DATE('2024-09-03', 'YYYY-MM-DD'));
INSERT INTO ENROLL (enroll_id, course_id, enroll_date) VALUES (4, 40,
TO_DATE('2024-09-04', 'YYYY-MM-DD'));
INSERT INTO ENROLL (enroll_id, course_id, enroll_date) VALUES (5, 50,
TO_DATE('2024-09-05', 'YYYY-MM-DD'));
INSERT INTO ENROLL (enroll_id, course_id, enroll_date) VALUES (6, 60,
TO_DATE('2024-09-01', 'YYYY-MM-DD'));
INSERT INTO ENROLL (enroll_id, course_id, enroll_date) VALUES (7, 60,
TO_DATE('2024-09-02', 'YYYY-MM-DD'));
INSERT INTO ENROLL (enroll_id, course_id, enroll_date) VALUES (8, 60,
TO_DATE('2024-09-03', 'YYYY-MM-DD'));
INSERT INTO ENROLL (enroll_id, course_id, enroll_date) VALUES (9, 60,
TO_DATE('2024-09-04', 'YYYY-MM-DD'));
INSERT INTO ENROLL (enroll_id, course_id, enroll_date) VALUES (10, 60,
TO_DATE('2024-09-05', 'YYYY-MM-DD'));

INSERT INTO MARKS (marks_id, enroll_id, subject_id,grade) VALUES (1, 1,
101,  'A');
INSERT INTO MARKS (marks_id, enroll_id, subject_id, grade) VALUES (2, 2,
102,  'B');
INSERT INTO MARKS (marks_id, enroll_id, subject_id, grade) VALUES (3, 3,
103,  'A');
INSERT INTO MARKS (marks_id, enroll_id, subject_id, grade) VALUES (4, 4,
104,  'B');
INSERT INTO MARKS (marks_id, enroll_id, subject_id, grade) VALUES (5, 5,
105,  'D');



INSERT INTO ENROLL_SUBJECT (enroll_id, subject_id) VALUES (1, 101);
INSERT INTO ENROLL_SUBJECT (enroll_id, subject_id) VALUES (2, 101);
INSERT INTO ENROLL_SUBJECT (enroll_id, subject_id) VALUES (3, 102);
INSERT INTO ENROLL_SUBJECT (enroll_id, subject_id) VALUES (4, 102);
INSERT INTO ENROLL_SUBJECT (enroll_id, subject_id) VALUES (5, 103);
INSERT INTO ENROLL_SUBJECT (enroll_id, subject_id) VALUES (6, 103);
INSERT INTO ENROLL_SUBJECT (enroll_id, subject_id) VALUES (7, 104);
INSERT INTO ENROLL_SUBJECT (enroll_id, subject_id) VALUES (8, 104);
INSERT INTO ENROLL_SUBJECT (enroll_id, subject_id) VALUES (9, 105);
INSERT INTO ENROLL_SUBJECT (enroll_id, subject_id) VALUES (10, 105);
]
```

Q2.) At the time of creation if we forget to create a field enrollment date (ENROLL_DATE) in ENROLL table so add the field.

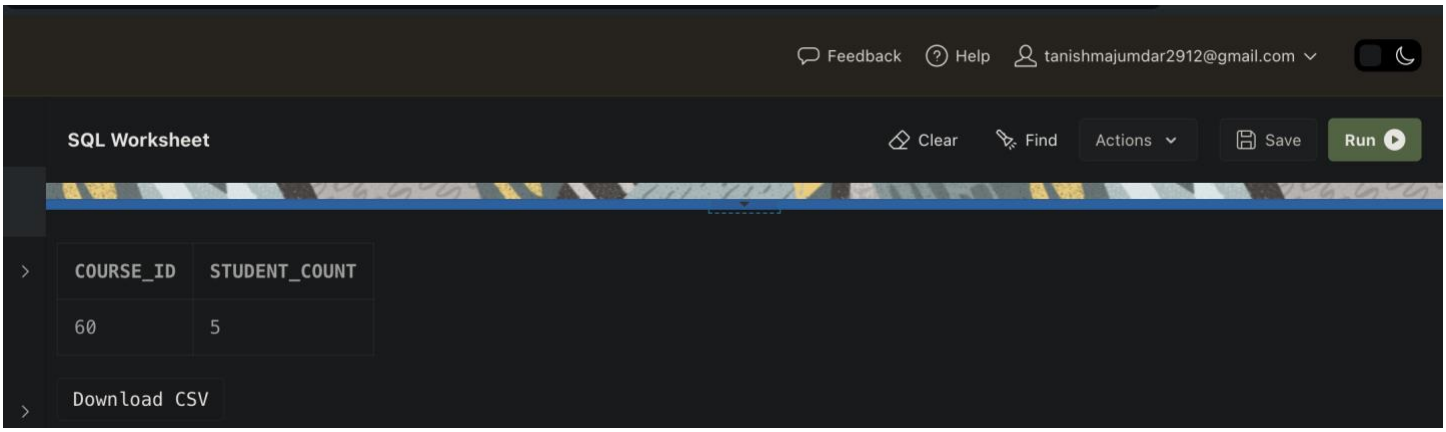
```
ALTER TABLE ENROLL ADD (enroll_date DATE);
```

Q3.) Course name cannot be blank, therefore add the criteria in the specific table.

```
ALTER TABLE COURSE MODIFY (course_name VARCHAR2(100) NOT NULL);
```

Q4.) Find the Course which has more than 3 students.

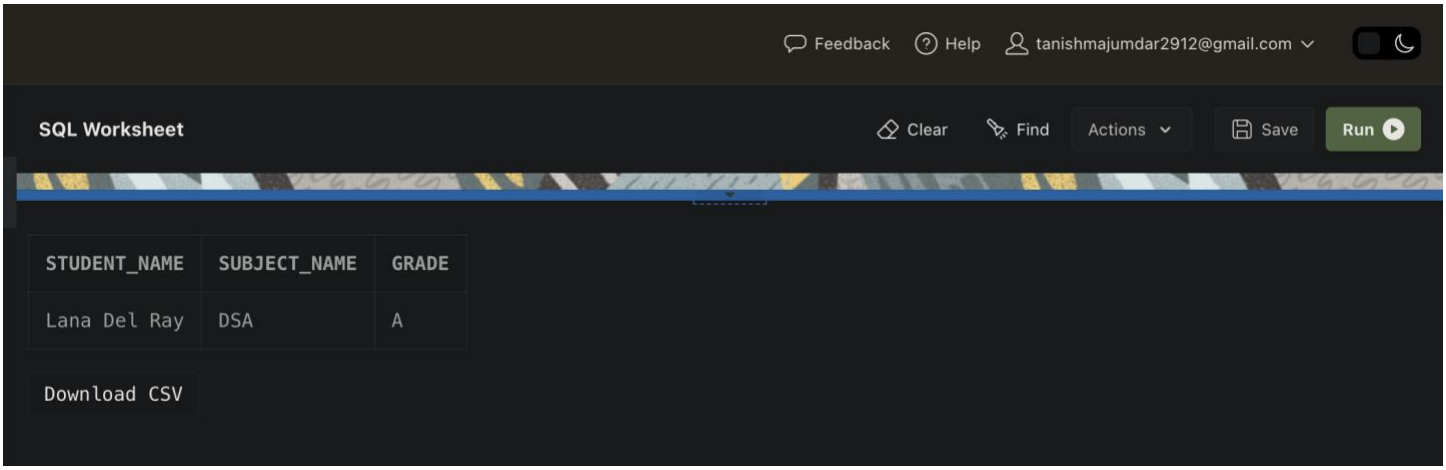
```
SELECT course_id, COUNT(*) AS student_count
FROM ENROLL
GROUP BY course_id
HAVING COUNT(*) > 3;
```



Q5.) Give the details of a STUDENT with all Subjects and Grade where he/she enroll (Enter the id value as input).

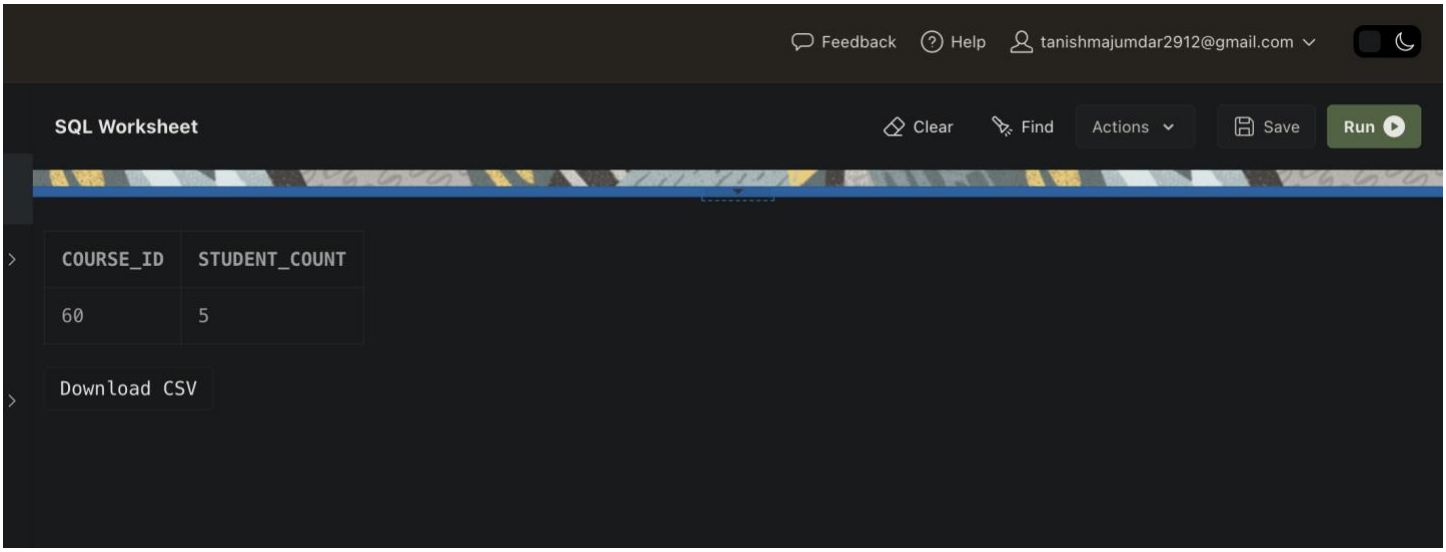
```
SELECT
    S.student_name,
    SU.subject_name,
    M.grade
FROM
    STUDENT S,
    ENROLL E,
    ENROLL_SUBJECT ES,
```

```
    SUBJECT SU,
    MARKS M
WHERE
    S.enroll_id = E.enroll_id
    AND E.enroll_id = ES.enroll_id
    AND E.enroll_id = M.enroll_id
    AND ES.subject_id = SU.subject_id
     AND S.enroll_id= 1
```



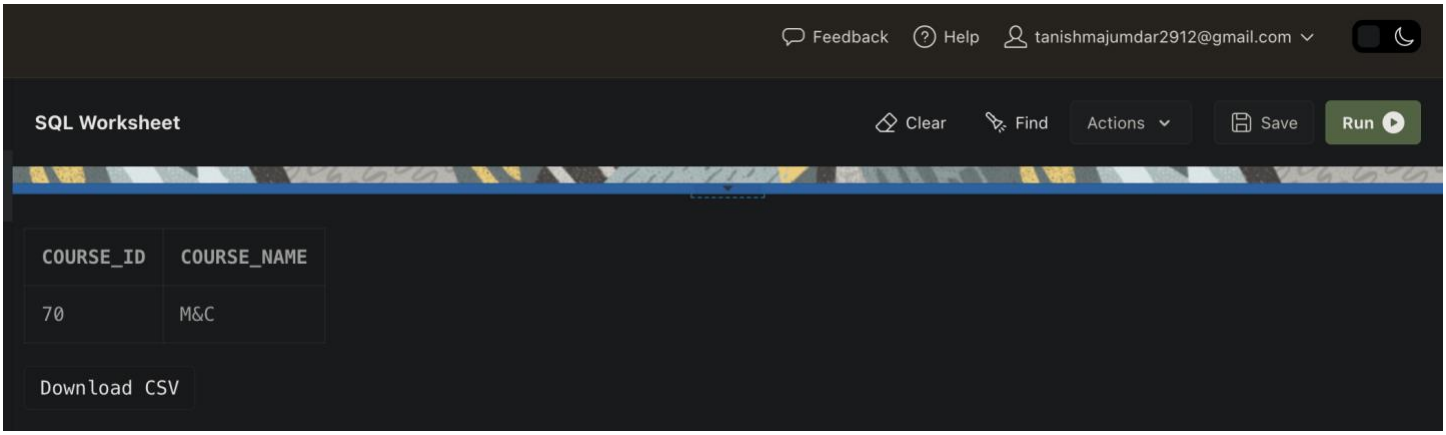
Q6.) Display the course where the maximum number of students enrolls.

```
SELECT course_id, COUNT(*) AS student_count
FROM ENROLL
GROUP BY course_id
ORDER BY student_count DESC
FETCH FIRST 1 ROWS ONLY;
```



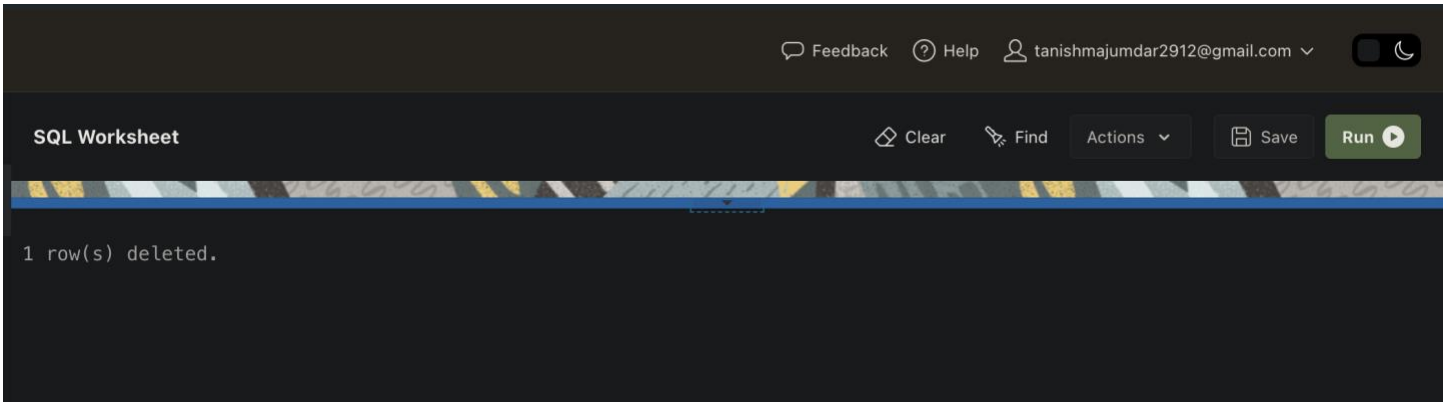
Q7.) Find out the course where no student is enrolled.

```
SELECT C.course_id, C.course_name
FROM COURSE C
WHERE C.course_id NOT IN (
    SELECT E.course_id
    FROM ENROLL E
);
```



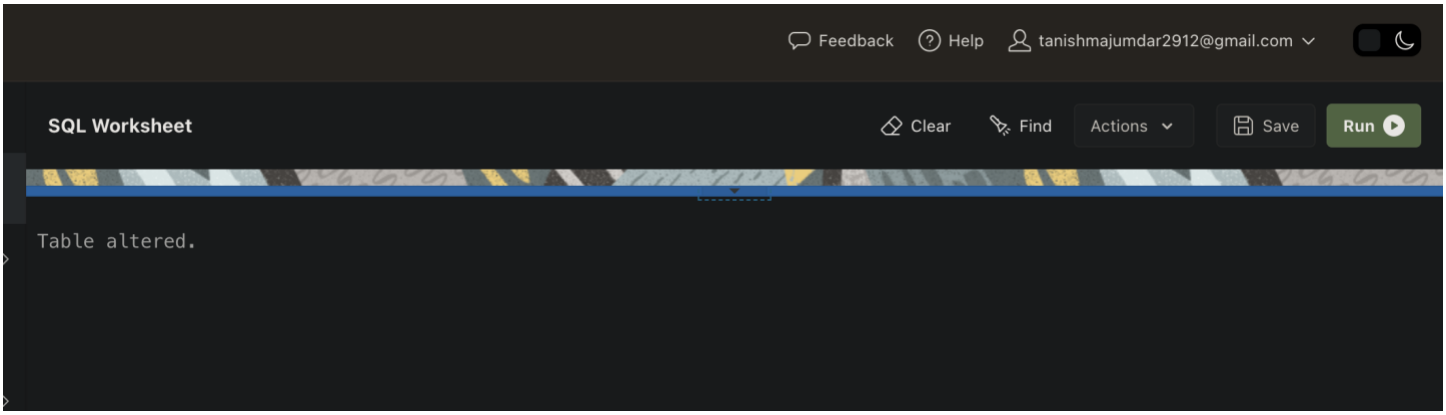
Q8.) Delete Course no 30 from COURSE table.

```
DELETE FROM COURSE WHERE course_id = 30;
```



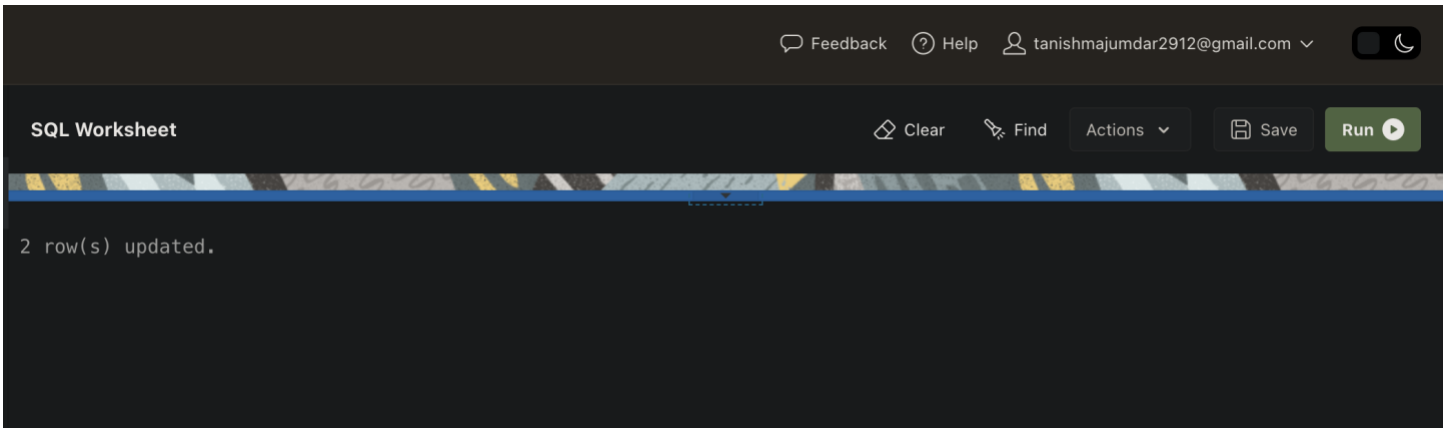
Q9.) Rename the COURSE table as DEPARTMENT.

```
ALTER TABLE COURSE RENAME TO DEPARTMENT;
```



Q10.) Change the Marks Grade of Student “A” to “B” who is Enroll in the subject DBMS.

```
UPDATE MARKS
SET grade = 'B'
WHERE enroll_id IN (
    SELECT enroll_id
    FROM ENROLL
    WHERE enroll_id IN (
        SELECT enroll_id
        FROM ENROLL_SUBJECT
        WHERE subject_id = (
            SELECT subject_id
            FROM SUBJECT
            WHERE subject_name = 'DBMS'
        )
    )
);
```



Q11.) Delete the record of the student who is enrolled in the course ‘IT’.

```
DELETE FROM STUDENT
WHERE enroll_id IN (
    SELECT enroll_id
    FROM ENROLL
    WHERE course_id = (
        SELECT course_id
        FROM DEPARTMENT
        WHERE course_name = 'IT'
    )
);
```

Q12.) Change the enroll date to ‘16-08-2018’ whose student id is 18069 (first convert the date into the default format).

```
UPDATE ENROLL
SET enroll_date = TO_DATE('16-08-2018', 'DD-MM-YYYY')
WHERE enroll_id = 18069;
```