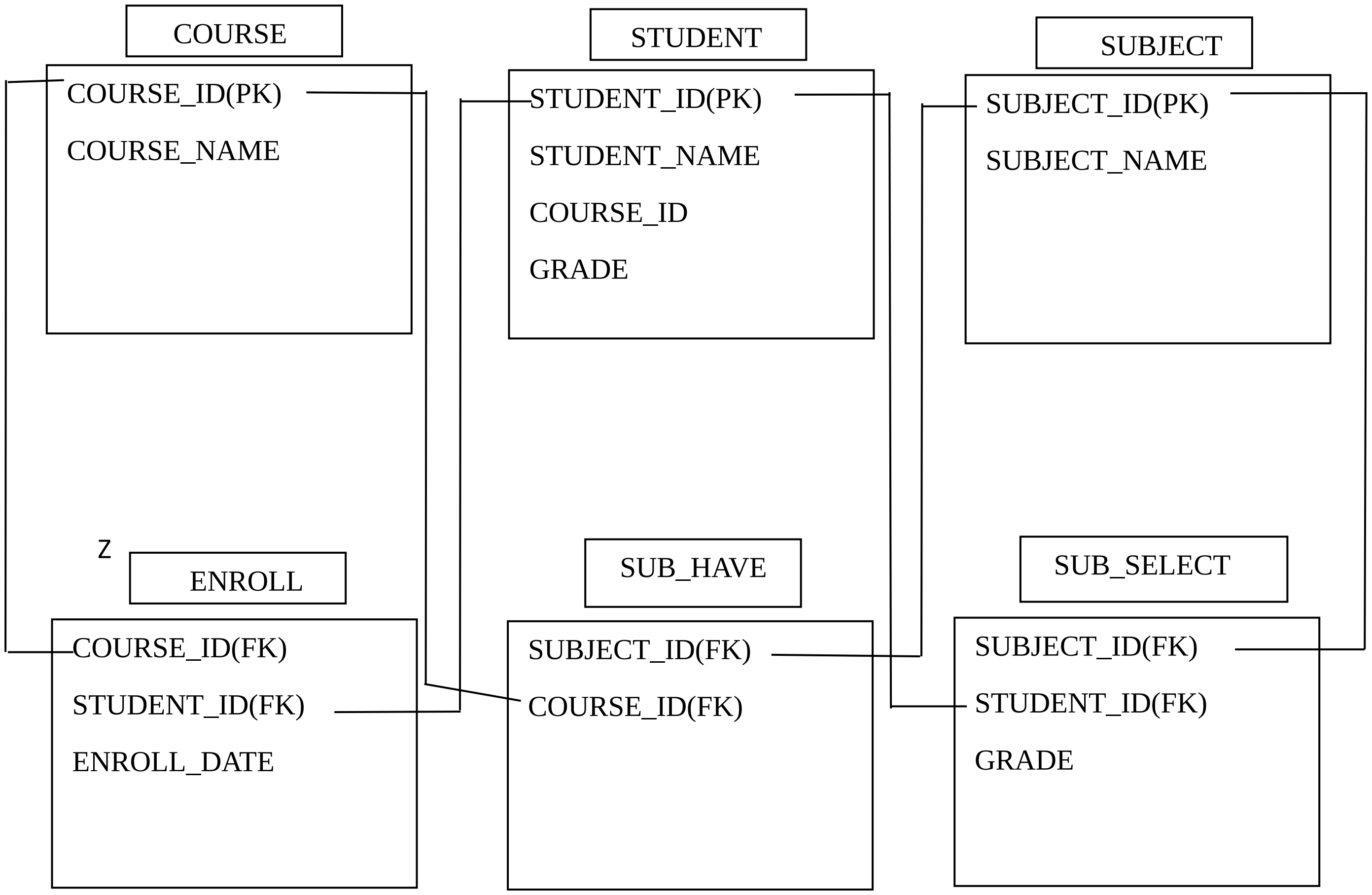
# SOUGATA SAHA

# IT-A2-037 DBMS ASSIGNMENT 3

# DATABASE SCHEMA



COURSE

COURSE_ID(PK)
COURSE_NAME

STUDENT

STUDENT_ID(PK)
STUDENT_NAME
COURSE_ID
GRADE

SUBJECT

SUBJECT_ID(PK)
SUBJECT_NAME

Z

ENROLL

COURSE_ID(FK)
STUDENT_ID(FK)
ENROLL_DATE

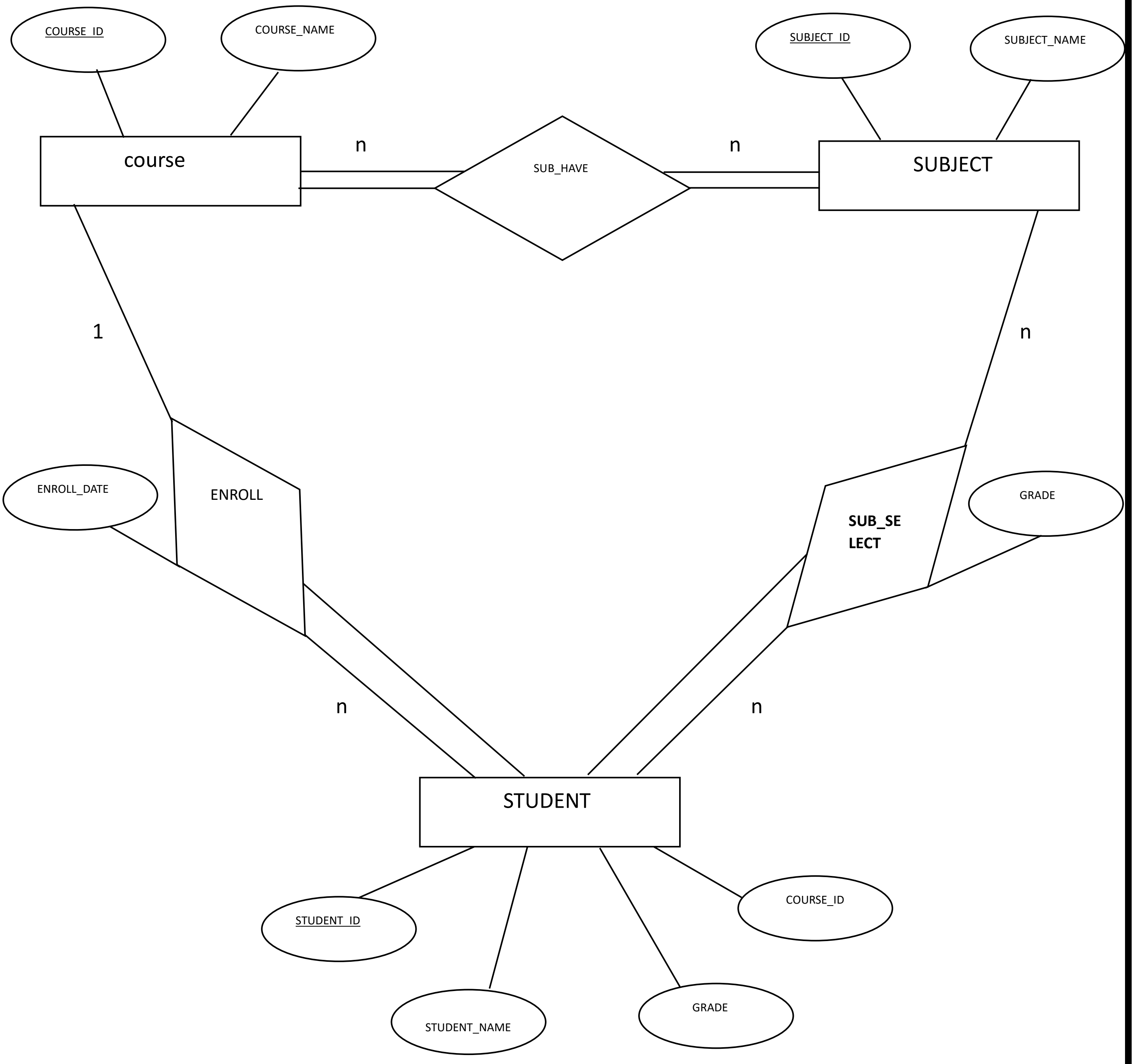
SUB_HAVE

SUBJECT_ID(FK)
COURSE_ID(FK)

SUB_SELECT

SUBJECT_ID(FK)
STUDENT_ID(FK)
GRADE

# ER DIAGRAM


COURSE_ID
COURSE_NAME
SUBJECT_ID
SUBJECT_NAME
course
n
SUB_HAVE
n
SUBJECT
1
n
ENROLL_DATE
ENROLL
SUB_SE LECT
GRADE
n
n
STUDENT
STUDENT_ID
COURSE_ID
STUDENT_NAME
GRADE

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

**Ans:-**

```
CREATE TABLE COURSE  (
    COURSE_ID INT PRIMARY KEY,
    COURSE_NAME VARCHAR2(50)
);
CREATE TABLE STUDENT (
    STUDENT_ID INT PRIMARY KEY,
    STUDENT_NAME VARCHAR2(50),
    COURSE_ID INT ,
    GRADE VARCHAR(2),
   FOREIGN KEY (COURSE_ID) REFERENCES COURSE (COURSE_ID)
);
CREATE TABLE SUBJECT (
    SUBJECT_ID INT PRIMARY KEY,
    SUBJECT_NAME VARCHAR(50)
);
CREATE TABLE ENROLL(
    COURSE_ID INT ,
    STUDENT_ID INT ,
    ENROLL_DATE DATE,
    FOREIGN KEY (COURSE_ID) REFERENCES COURSE (COURSE_ID),
    FOREIGN KEY (STUDENT_ID) REFERENCES STUDENT (STUDENT_ID)
);
CREATE TABLE SUB_HAVE(
    COURSE_ID INT,
    SUBJECT_ID  INT ,
    SUBJECT_NAME VARCHAR2(50),
     FOREIGN KEY (COURSE_ID) REFERENCES COURSE (COURSE_ID),
     FOREIGN KEY (SUBJECT_ID) REFERENCES SUBJECT (SUBJECT_ID)
);
```

```sql
CREATE TABLE SUB_SELECT(
    STUDENT_ID INT,
    SUBJECT_ID INT,
    GRADE VARCHAR(2),
  FOREIGN KEY (STUDENT_ID) REFERENCES STUDENT (STUDENT_ID),
 FOREIGN KEY (SUBJECT_ID) REFERENCES SUBJECT (SUBJECT_ID)

);



-- Insert into COURSE
INSERT INTO COURSE (COURSE_ID, COURSE_NAME) VALUES (1, 'Computer Science');
INSERT INTO COURSE (COURSE_ID, COURSE_NAME) VALUES (2, 'Information Technology');
INSERT INTO COURSE (COURSE_ID, COURSE_NAME) VALUES (3, 'Data Science');
INSERT INTO COURSE (COURSE_ID, COURSE_NAME) VALUES (4, 'Electrical Engineering');
INSERT INTO COURSE (COURSE_ID, COURSE_NAME) VALUES (5, 'Mechanical Engineering');

-- Insert into STUDENT
INSERT INTO STUDENT (STUDENT_ID, STUDENT_NAME, COURSE_ID, GRADE) VALUES
(101, 'Alice', 1, 'A');
INSERT INTO STUDENT (STUDENT_ID, STUDENT_NAME, COURSE_ID, GRADE) VALUES
(102, 'Bob', 1, 'B');
INSERT INTO STUDENT (STUDENT_ID, STUDENT_NAME, COURSE_ID, GRADE) VALUES
(103, 'Charlie', 2, 'B');
INSERT INTO STUDENT (STUDENT_ID, STUDENT_NAME, COURSE_ID, GRADE) VALUES
(104, 'David', 2, 'A');
INSERT INTO STUDENT (STUDENT_ID, STUDENT_NAME, COURSE_ID, GRADE) VALUES
(105, 'Eve', 3, 'B');
INSERT INTO STUDENT (STUDENT_ID, STUDENT_NAME, COURSE_ID, GRADE) VALUES
(106, 'Frank', 1, 'C');
INSERT INTO STUDENT (STUDENT_ID, STUDENT_NAME, COURSE_ID, GRADE) VALUES
(107, 'Grace', 1, 'C');
INSERT INTO STUDENT (STUDENT_ID, STUDENT_NAME, COURSE_ID, GRADE) VALUES
(108, 'Hannah', 1, 'A');
```

```sql
INSERT INTO STUDENT (STUDENT_ID, STUDENT_NAME, COURSE_ID, GRADE) VALUES (109, 'Ian', 2, 'C');

INSERT INTO STUDENT (STUDENT_ID, STUDENT_NAME, COURSE_ID, GRADE) VALUES (110, 'Jane', 2, 'B');




-- Insert into SUBJECT

INSERT INTO SUBJECT (SUBJECT_ID, SUBJECT_NAME) VALUES (201, 'Mathematics');

INSERT INTO SUBJECT (SUBJECT_ID, SUBJECT_NAME) VALUES (202, 'Programming');

INSERT INTO SUBJECT (SUBJECT_ID, SUBJECT_NAME) VALUES (203, 'Database Systems');

INSERT INTO SUBJECT (SUBJECT_ID, SUBJECT_NAME) VALUES (204, 'Operating Systems');

INSERT INTO SUBJECT (SUBJECT_ID, SUBJECT_NAME) VALUES (205, 'Networks');

INSERT INTO SUBJECT (SUBJECT_ID, SUBJECT_NAME) VALUES (206, 'Data Structures');

INSERT INTO SUBJECT (SUBJECT_ID, SUBJECT_NAME) VALUES (207, 'Algorithms');


-- Insert into ENROLL

INSERT INTO ENROLL (STUDENT_ID, ENROLL_DATE, COURSE_ID) VALUES (101, TO_DATE('2023-01-15', 'YYYY-MM-DD'), 1);

INSERT INTO ENROLL (STUDENT_ID, ENROLL_DATE, COURSE_ID) VALUES (102, TO_DATE('2023-01-16', 'YYYY-MM-DD'), 1);

INSERT INTO ENROLL (STUDENT_ID, ENROLL_DATE, COURSE_ID) VALUES (103, TO_DATE('2023-01-17', 'YYYY-MM-DD'), 2);

INSERT INTO ENROLL (STUDENT_ID, ENROLL_DATE, COURSE_ID) VALUES (104, TO_DATE('2023-01-18', 'YYYY-MM-DD'), 2);

INSERT INTO ENROLL (STUDENT_ID, ENROLL_DATE, COURSE_ID) VALUES (105, TO_DATE('2023-01-19', 'YYYY-MM-DD'), 3);


-- Insert into SUB_HAVE

INSERT INTO SUB_HAVE (COURSE_ID, SUBJECT_ID, SUBJECT_NAME) VALUES (1, 201, 'Mathematics');

INSERT INTO SUB_HAVE (COURSE_ID, SUBJECT_ID, SUBJECT_NAME) VALUES (1, 202, 'Programming');

INSERT INTO SUB_HAVE (COURSE_ID, SUBJECT_ID, SUBJECT_NAME) VALUES (2, 203, 'Database Systems');
INSERT INTO SUB_HAVE (COURSE_ID, SUBJECT_ID, SUBJECT_NAME) VALUES (2, 204,
'Operating Systems');

INSERT INTO SUB_HAVE (COURSE_ID, SUBJECT_ID, SUBJECT_NAME) VALUES (3, 205,
'Networks');

INSERT INTO SUB_HAVE (COURSE_ID, SUBJECT_ID, SUBJECT_NAME) VALUES (3, 206,
'Data Structures');

INSERT INTO SUB_HAVE (COURSE_ID, SUBJECT_ID, SUBJECT_NAME) VALUES (3, 207,
'Algorithms');


-- Insert into SUB_SELECT

INSERT INTO SUB_SELECT (STUDENT_ID, SUBJECT_ID, GRADE) VALUES (101, 201, 'A');

INSERT INTO SUB_SELECT (STUDENT_ID, SUBJECT_ID, GRADE) VALUES (101, 202, 'B');

INSERT INTO SUB_SELECT (STUDENT_ID, SUBJECT_ID, GRADE) VALUES (102, 201, 'A');

INSERT INTO SUB_SELECT (STUDENT_ID, SUBJECT_ID, GRADE) VALUES (102, 202, 'B');

INSERT INTO SUB_SELECT (STUDENT_ID, SUBJECT_ID, GRADE) VALUES (103, 203, 'B');

INSERT INTO SUB_SELECT (STUDENT_ID, SUBJECT_ID, GRADE) VALUES (103, 204, 'C');

INSERT INTO SUB_SELECT (STUDENT_ID, SUBJECT_ID, GRADE) VALUES (104, 203, 'A');

INSERT INTO SUB_SELECT (STUDENT_ID, SUBJECT_ID, GRADE) VALUES (104, 204, 'A');

INSERT INTO SUB_SELECT (STUDENT_ID, SUBJECT_ID, GRADE) VALUES (105, 205, 'B');

INSERT INTO SUB_SELECT (STUDENT_ID, SUBJECT_ID, GRADE) VALUES (105, 206, 'A');

INSERT INTO SUB_SELECT (STUDENT_ID, SUBJECT_ID, GRADE) VALUES (105, 207, 'A');
```

**Q2. At the time of creation if we forget to create a field enrollment date (ENROLL_DATE)**

**in ENROLL table so add the field.**

**Ans:**

```
ALTER TABLE COURSE

MODIFY COURSE_NAME VARCHAR2(50) NOT NULL;
```

**Q3. Course name cannot be blank, therefore add the criteria in the specific table.**
**Ans:**

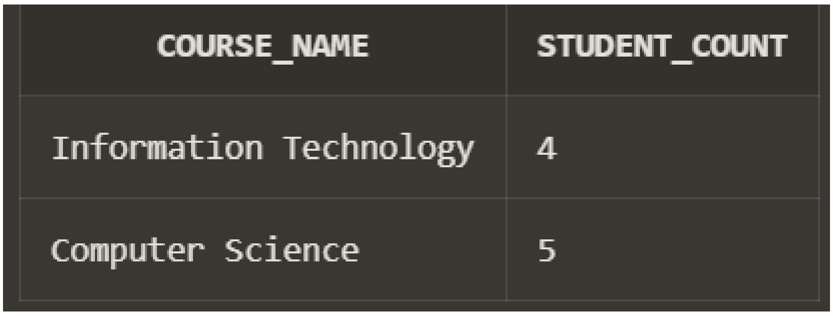
```
ALTER TABLE COURSE

MODIFY COURSE_NAME VARCHAR2(50) NOT NULL;
```

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

**Ans:**

```
SELECT COURSE.COURSE_NAME, COUNT(STUDENT.STUDENT_ID) AS
STUDENT_COUNT
```

```
FROM STUDENT
LEFT JOIN COURSE ON COURSE.COURSE_ID = STUDENT.COURSE_ID
GROUP BY COURSE.COURSE_NAME,STUDENT.COURSE_ID
HAVING COUNT(STUDENT.STUDENT_ID) > 3;
```

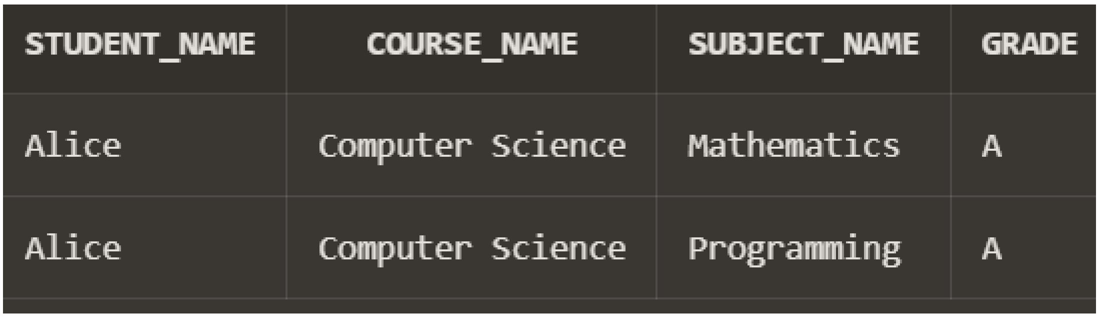


| COURSE_NAME | STUDENT_COUNT |
|---|---|
| Information Technology | 4 |
| Computer Science | 5 |

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

**Ans:**

```
SELECT STUDENT_NAME, COURSE_NAME, SUBJECT_NAME, GRADE
FROM STUDENT S
JOIN COURSE C ON S.COURSE_ID = C.COURSE_ID
JOIN SUB_SELECT SS ON S.STUDENT_ID = SS.STUDENT_ID
JOIN SUBJECT SB ON SS.SUBJECT_ID = SB.SUBJECT_ID
WHERE S.STUDENT_ID = 101;
```



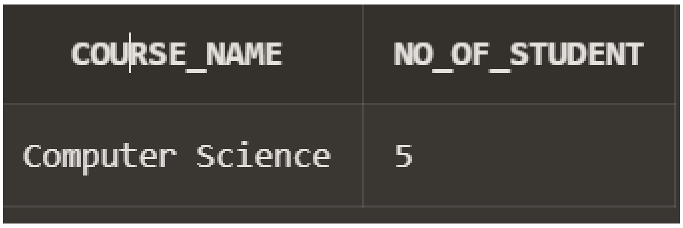
| STUDENT_NAME | COURSE_NAME | SUBJECT_NAME | GRADE |
|---|---|---|---|
| Alice | Computer Science | Mathematics | A |
| Alice | Computer Science | Programming | A |

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

**Ans:**

```
SELECT COURSE_NAME, COUNT(STUDENT_ID) AS "NO_OF_STUDENT"
FROM STUDENT
LEFT JOIN COURSE ON STUDENT.COURSE_ID = COURSE.COURSE_ID
GROUP BY COURSE.COURSE_ID, COURSE.COURSE_NAME
```

```
HAVING COUNT(STUDENT_ID) = (
    SELECT MAX(student_count)
    FROM (
        SELECT COUNT(STUDENT_ID) AS student_count
        FROM STUDENT
        GROUP BY COURSE_ID
    )
);
```

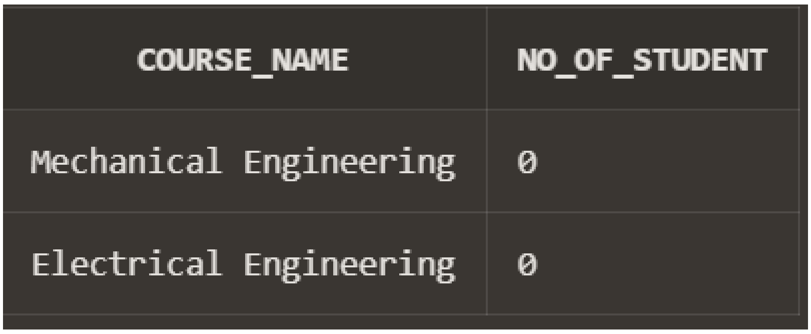


| COURSE_NAME | NO_OF_STUDENT |
|---|---|
| Computer Science | 5 |

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

**Ana:**

```
SELECT COURSE_NAME, COUNT(STUDENT_ID) AS "NO_OF_STUDENT"
FROM COURSE
LEFT JOIN STUDENT ON STUDENT.COURSE_ID = COURSE.COURSE_ID
GROUP BY COURSE.COURSE_ID, COURSE.COURSE_NAME
HAVING COUNT(STUDENT_ID) = 0
```



| COURSE_NAME | NO_OF_STUDENT |
|---|---|
| Mechanical Engineering | 0 |
| Electrical Engineering | 0 |

**Q8. Delete Course no 30 from COURSE table.**

**Ans:**

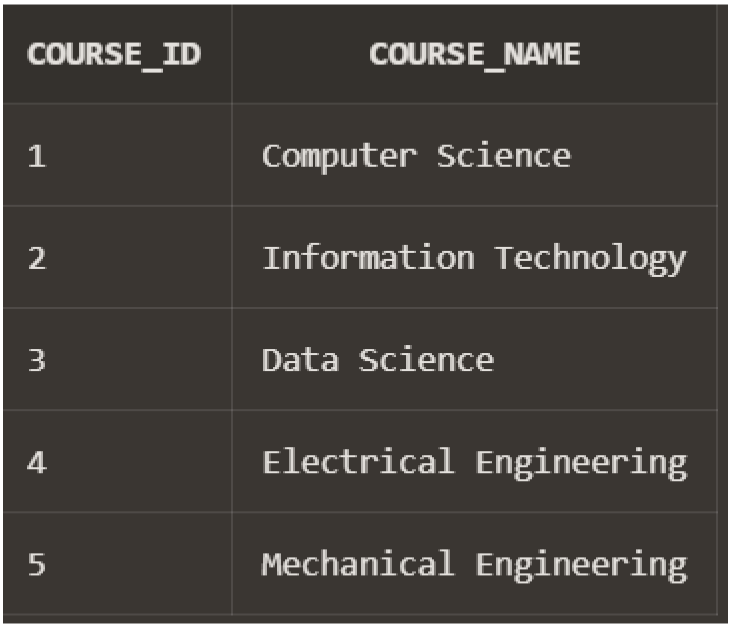
```
DELETE FROM COURSE
WHERE COURSE_ID = 30;
```

**Q9. Rename the COURSE table as DEPARTMENT.**

**Ans:**

```
ALTER TABLE COURSE
```

```
RENAME TO DEPARTMENT;
SELECT * FROM DEPARTMENT
```



| COURSE_ID | COURSE_NAME |
|---|---|
| 1 | Computer Science |
| 2 | Information Technology |
| 3 | Data Science |
| 4 | Electrical Engineering |
| 5 | Mechanical Engineering |

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

**Ans:**

```
UPDATE STUDENT S
SET GRADE = 'B'
WHERE S.STUDENT_NAME = 'A'
AND S.STUDENT_ID IN (
    SELECT SS.STUDENT_ID
    FROM SUB_SELECT SS
    JOIN SUBJECT SB ON SS.SUBJECT_ID = SB.SUBJECT_ID
    WHERE SB.SUBJECT_NAME = 'Database Systems');
```

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

**Ans:**

```
DELETE FROM STUDENT
WHERE COURSE_ID = 2;
```

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

**Ans:**

```
UPDATE ENROLL
SET ENROLL_DATE = TO_DATE('2018-08-16', 'DD-MM-YYYY')
```

```
WHERE STUDENT_ID = 18069;


;
```