ASSIGNMENT 11 MySQL

Create three tables using MySQL

(1) Students

```sql
CREATE TABLE students (
    student_id INT PRIMARY KEY AUTO_INCREMENT,
    first_name VARCHAR(50),
    last_name VARCHAR(50),
    email VARCHAR(100),
    birthdate DATE,
    gender ENUM('Male', 'Female'),
    enrollment_date DATE
);
```

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra
1	**student_id** 🔑	int(11)			No	*None*		AUTO_INCREMENT
2	**first_name**	varchar(50)	utf8mb4_general_ci		Yes	*NULL*		
3	**last_name**	varchar(50)	utf8mb4_general_ci		Yes	*NULL*		
4	**email**	varchar(100)	utf8mb4_general_ci		Yes	*NULL*		
5	**birthdate**	date			Yes	*NULL*		
6	**gender**	enum('Male', 'Female')	utf8mb4_general_ci		Yes	*NULL*		
7	**enrollment_date**	date			Yes	*NULL*		

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(2) Courses

```sql
CREATE TABLE courses (
    course_id INT PRIMARY KEY AUTO_INCREMENT,
    course_name VARCHAR(100),
    course_description TEXT,
    start_date DATE,
    end_date DATE
);
```

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra
1	**course_id** 🔑	int(11)			No	*None*		AUTO_INCREMENT
2	**course_name**	varchar(100)	utf8mb4_general_ci		No	*None*		
3	**course_description**	text	utf8mb4_general_ci		No	*None*		
4	**start_date**	date			No	*None*		
5	**end_date**	date			No	*None*		

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(3) enrollments

```sql
CREATE TABLE enrollments (
    enrollment_id INT NOT NULL AUTO_INCREMENT,
    student_id INT NOT NULL,
    course_id INT NOT NULL,
    PRIMARY KEY (enrollment_id),
    FOREIGN KEY (student_id) REFERENCES students(student_id) ON DELETE CASCADE ON UPDATE CASCADE,
    FOREIGN KEY (course_id) REFERENCES courses(course_id) ON DELETE CASCADE ON UPDATE CASCADE
);
```

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra
1	**enrollment_id** 🔑	int(11)			No	*None*		AUTO_INCREMENT
2	**student_id** 🔗	int(11)			No	*None*		
3	**course_id** 🔗	int(11)			No	*None*		

Add some data in all tables

```sql
INSERT INTO students (first_name, last_name, email, birthdate, gender, enrollment_date) VALUES
('Aarav', 'Sharma', 'aarav.sharma@example.com', '2003-01-15', 'Male', '2024-01-01'),
('Aditi', 'Mehta', 'aditi.mehta@example.com', '2003-02-10', 'Female', '2024-01-01'),
('Ishaan', 'Singh', 'ishaan.singh@example.com', '2003-02-14', 'Male', '2024-01-01'),
('Riya', 'Patel', 'riya.patel@example.com', '2003-06-21', 'Female', '2024-01-01'),
('Kavya', 'Reddy', 'kavya.reddy@example.com', '2003-07-10', 'Female', '2024-01-01'),
('Vivaan', 'Nair', 'vivaan.nair@example.com', '2003-03-09', 'Male', '2024-01-01'),
('Ananya', 'Ghosh', 'ananya.ghosh@example.com', '2003-05-25', 'Female', '2024-01-01'),
('Arjun', 'Kumar', 'arjun.kumar@example.com', '2003-08-14', 'Male', '2024-01-01'),
('Saanvi', 'Joshi', 'saanvi.joshi@example.com', '2004-08-18', 'Female', '2024-01-01'),
('Dev', 'Bose', 'dev.bose@example.com', '2003-12-12', 'Male', '2024-01-01');
```

student_id	first_name	last_name	email	birthdate	gender	enrollment_date
1	Aarav	Sharma	aarav.sharma@example.com	2003-01-15	Male	2024-01-01
2	Aditi	Mehta	aditi.mehta@example.com	2003-02-10	Female	2024-01-01
3	ishaan	Singh	ishaan.singh@example.com	2003-02-14	Male	2024-01-01
4	Riya	Patel	riya.patel@example.com	2003-06-21	Female	2024-01-01
5	Kavya	Reddy	kavya.reddy@example.com	2003-07-10	Female	2024-01-01
6	Vivaan	Nair	vivaan.nair@example.com	2003-03-09	Male	2024-01-01
7	Ananya	Ghosh	ananya.ghosh@example.com	2003-05-25	Female	2024-01-01
8	Arjun	Kumar	arjun.kumar@example.com	2003-08-14	Male	2024-01-01
9	Saanvi	Joshi	saanvi.joshi@example.com	2004-08-18	Female	2024-01-01
10	Dev	Bose	dev.bose@example.com	2003-12-12	Male	2024-01-01

```sql
INSERT INTO courses (course_name, course_description, start_date, end_date) VALUES
('Database System','Introduction to Database Systems and SQL','2024-02-01','2024-05-01'),
('Web Development', 'Learn HTML, CSS, JavaScript, and basic web development techniques.', '2024-02-01', '2024-05-01'),
('Data Structures', 'Learn about various data structures and their applications.', '2024-02-01', '2024-05-01'),
('Algorithms', 'Introduction to algorithms and problem-solving techniques.', '2024-02-01', '2024-05-01'),
('Computer Networks', 'Overview of computer networking principles and practices.', '2024-02-01', '2024-05-01');
```

course_id	course_name	course_description	start_date	end_date
1	Database System	Introduction to Database Systems and SQL	2024-02-01	2024-05-01
2	Web Development	Learn HTML, CSS, JavaScript, and basic web develop...	2024-02-01	2024-05-01
3	Data Structures	Learn about various data structures and their appl...	2024-02-01	2024-05-01
4	Algorithms	Introduction to algorithms and problem-solving tec...	2024-02-01	2024-05-01
5	Computer Networks	Overview of computer networking principles and pra...	2024-02-01	2024-05-01

```sql
INSERT INTO enrollments (student_id, course_id) VALUES
(1, 1),
(2, 1),
(2, 3),
(2, 5),
(3, 2),
(3, 4),
(4, 3),
(4, 5),
(5, 1),
(5, 4),
(6, 5),
(6, 2),
(7, 1),
(8, 3),
```

enrollment_id	student_id	course_id
1	1	1
2	2	1
3	2	3
4	2	5
5	3	2
6	3	4
7	4	3
8	4	5
9	5	1
10	5	4
11	6	5
12	6	2
13	7	1
14	8	3
15	9	4
16	10	5

Question 1)

Retrieve a list of all students along with the courses they are enrolled in, including students who are not enrolled in any course.

```sql
SELECT s.student_id, s.first_name, s.last_name, c.course_id, c.course_name
FROM students s
LEFT JOIN enrollments e ON s.student_id = e.student_id
LEFT JOIN courses c ON e.course_id = c.course_id;
```

student_id	first_name	last_name	course_id	course_name
1	Aarav	Sharma	1	Database System
2	Aditi	Mehta	1	Database System
2	Aditi	Mehta	3	Data Structures
2	Aditi	Mehta	5	Computer Networks
3	Ishaan	Singh	2	Web Development
3	Ishaan	Singh	4	Algorithms
4	Riya	Patel	3	Data Structures
4	Riya	Patel	5	Computer Networks
5	Kavya	Reddy	1	Database System
5	Kavya	Reddy	4	Algorithms
6	Vivaan	Nair	5	Computer Networks
6	Vivaan	Nair	2	Web Development
7	Ananya	Ghosh	1	Database System
8	Arjun	Kumar	3	Data Structures
9	Saanvi	Joshi	4	Algorithms
10	Dev	Bose	5	Computer Networks

Question 2)

Find the number of courses each student is enrolled in, and include students who are not enrolled in any course.

```sql
SELECT s.student_id, s.first_name, s.last_name, COUNT(e.course_id) AS number_of_courses
FROM students s
LEFT JOIN enrollments e ON s.student_id = e.student_id
GROUP BY s.student_id, s.first_name, s.last_name;
```

student_id	first_name	last_name	number_of_courses
1	Aarav	Sharma	1
2	Aditi	Mehta	3
3	Ishaan	Singh	2
4	Riya	Patel	2
5	Kavya	Reddy	2
6	Vivaan	Nair	2
7	Ananya	Ghosh	1
8	Arjun	Kumar	1
9	Saanvi	Joshi	1
10	Dev	Bose	1

Question 3)

List all courses along with the number of students enrolled in each course. Include courses that currently have no students enrolled

```sql
SELECT c.course_id, c.course_name, COUNT(e.student_id) AS number_of_students
FROM courses c
LEFT JOIN enrollments e ON c.course_id = e.course_id
GROUP BY c.course_id, c.course_name;
```

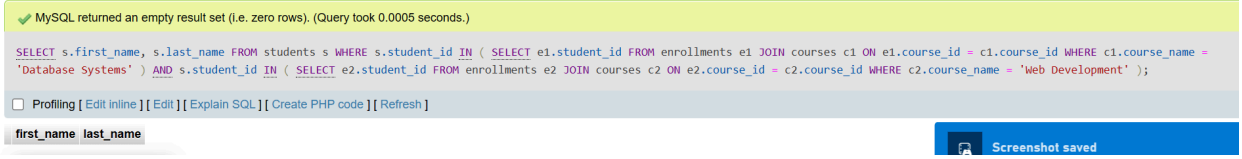
course_id	course_name	number_of_students
1	Database System	4
2	Web Development	2
3	Data Structures	3
4	Algorithms	3
5	Computer Networks	4

Question 4)

Find the names of students who are enrolled in both 'Database Systems' and 'Web Development' courses.

```sql
SELECT s.first_name, s.last_name
FROM students s
WHERE s.student_id IN (
    SELECT e1.student_id
    FROM enrollments e1
    JOIN courses c1 ON e1.course_id = c1.course_id
    WHERE c1.course_name = 'Database Systems'
)
AND s.student_id IN (
    SELECT e2.student_id
    FROM enrollments e2
    JOIN courses c2 ON e2.course_id = c2.course_id
    WHERE c2.course_name = 'Web Development'
);

```



Question 5)

Retrieve the first name, last name, and email of students who are enrolled in exactly two courses.

```sql
SELECT s.first_name, s.last_name, s.email
FROM students s
JOIN enrollments e ON s.student_id = e.student_id
GROUP BY s.student_id, s.first_name, s.last_name, s.email
HAVING COUNT(e.course_id) = 2;
```

first_name	last_name	email
Ishaan	Singh	ishaan.singh@example.com
Riya	Patel	riya.patel@example.com
Kavya	Reddy	kavya.reddy@example.com
Vivaan	Nair	vivaan.nair@example.com