Assignment Report

Database Assignment 2

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Create grades table

```
CREATE TABLE Grades (grade_id INT PRIMARY KEY, grade_name
VARCHAR(10));
```

Screenshot:

```
Data Output   Messages   Notifications

CREATE TABLE

Query returned successfully in 59 msec.
```

Create students table

```
CREATE TABLE Students (
  student_id INT PRIMARY KEY,
  student_name VARCHAR(50),
  student_age INT,
  student_grade_id INT,
  FOREIGN KEY (student_grade_id) REFERENCES Grades (grade_id)
);
```

Screenshot:

```
Data Output   Messages   Notifications

CREATE TABLE

Query returned successfully in 59 msec.
```

Create courses table

```
CREATE TABLE Courses (
  course_id INT PRIMARY KEY,
  course_name VARCHAR(50)
);
```

Screenshot:

```
Data Output   Messages   Notifications

CREATE TABLE

Query returned successfully in 59 msec.
```

Enrollments table

```sql
CREATE TABLE Enrollments (
  enrollment_id INT PRIMARY KEY,
  student_id INT,
  course_id INT,
  enrollment_date DATE,
  FOREIGN KEY (student_id) REFERENCES Students (student_id),
  FOREIGN KEY (course_id) REFERENCES Courses (course_id)
);
```

Screenshot

```
Data Output   Messages   Notifications

CREATE TABLE

Query returned successfully in 45 msec.
```

Insert queries:

Insert into Grades table

```
INSERT INTO
  Grades (grade_id, grade_name)
VALUES
  (1, 'A'),
  (2, 'B'),
  (3, 'C');
```

Screenshot:

Data Output Messages Notifications

	grade_id [PK] integer	grade_name character varying (10)
1	1	A
2	2	B
3	3	C

Insert into Courses table

```
INSERT INTO
  Courses (course_id, course_name)
VALUES
  (101, 'Math'),
  (102, 'Science'),
  (103, 'History');
```

Screenshot:

Data Output Messages Notifications

	grade_id [PK] integer	grade_name character varying (10)
1	1	A
2	2	B
3	3	C

Insert into Students table

```sql
INSERT INTO
  Students (
    student_id,
    student_name,
    student_age,
    student_grade_id
  )
VALUES
  (1, 'Alice', 17, 1),
  (2, 'Bob', 16, 2),
  (3, 'Charlie', 18, 1),
  (4, 'David', 16, 2),
  (5, 'Eve', 17, 1),
  (6, 'Frank', 18, 3),
  (7, 'Grace', 17, 2),
  (8, 'Henry', 16, 1),
  (9, 'Ivy', 18, 2),
  (10, 'Jack', 17, 3);
```

Screenshot:

Data Output Messages Notifications

	student_id [PK] integer	student_name character varying (50)	student_age integer	student_grade_id integer
1	1	Alice	17	1
2	2	Bob	16	2
3	3	Charlie	18	1
4	4	David	16	2
5	5	Eve	17	1
6	6	Frank	18	3
7	7	Grace	17	2
8	8	Henry	16	1
9	9	Ivy	18	2
10	10	Jack	17	3

Insert into Enrollments table

```sql
INSERT INTO
  Enrollments (
    enrollment_id,
    student_id,
    course_id,
    enrollment_date
  )
VALUES
  (1, 1, 101, '2023-09-01'),
  (2, 1, 102, '2023-09-01'),
  (3, 2, 102, '2023-09-01'),
  (4, 3, 101, '2023-09-01'),
  (5, 3, 103, '2023-09-01'),
  (6, 4, 101, '2023-09-01'),
  (7, 4, 102, '2023-09-01'),
```

```
  (8, 5, 102, '2023-09-01'),
  (9, 6, 101, '2023-09-01'),
  (10, 7, 103, '2023-09-01');
```

Screenshots:

Data Output Messages Notifications

	enrollment_id [PK] integer	student_id integer	course_id integer	enrollment_date date
1	1	1	101	2023-09-01
2	2	1	102	2023-09-01
3	3	2	102	2023-09-01
4	4	3	101	2023-09-01
5	5	3	103	2023-09-01
6	6	4	101	2023-09-01
7	7	4	102	2023-09-01
8	8	5	102	2023-09-01
9	9	6	101	2023-09-01
10	10	7	103	2023-09-01

Questions:

1. Find all students enrolled in the Math course.

```
SELECT
  s.*
FROM
  students s
  JOIN enrollments e ON s.student_id = e.student_id
  JOIN courses c ON e.course_id = c.course_id
WHERE
  c.course_name = 'Math'
GROUP BY
  s.student_id;
```

Screenshots:

Data Output Messages Notifications

	student_id [PK] integer	student_name character varying (50)	student_age integer	student_grade_id integer
1	1	Alice	17	1
2	3	Charlie	18	1
3	4	David	16	2
4	6	Frank	18	3

2. List all courses taken by students named Bob.

```
SELECT
  c.*
FROM
  courses c
  JOIN enrollments e ON c.course_id = e.course_id
  JOIN students s ON e.student_id = s.student_id
WHERE
  s.student_name = 'Bob';
```

Screenshots:

Data Output Messages Notifications

	course_id [PK] integer	course_name character varying (50)
1	102	Science

3. Find the names of students who are enrolled in more than one course.

```
SELECT
  s.student_name
FROM
  students s
  JOIN enrollments e ON s.student_id = e.student_id
  JOIN courses c ON e.course_id = c.course_id
GROUP BY
  s.student_id
HAVING
  COUNT(e.course_id) > 1;
```

Screenshots:

Data Output Messages Notifications

	student_name character varying (50)
1	David
2	Charlie
3	Alice

4. List all students who are in Grade A (grade_id = 1).

```
SELECT
  s.*
FROM
  students s
  JOIN grades g ON s.student_grade_id = g.grade_id
WHERE
  g.grade_id = 1;
```

Screenshot:

Data Output Messages Notifications

	student_id [PK] integer	student_name character varying (50)	student_age integer	student_grade_id integer
1	1	Alice	17	1
2	3	Charlie	18	1
3	5	Eve	17	1
4	8	Henry	16	1

5. Find the number of students enrolled in each course.

```
SELECT
  e.course_id,
  COUNT(e.student_id) AS students_enrolled
FROM
  enrollments e
GROUP BY
  e.course_id
ORDER BY
  e.course_id;
```

Screenshot:

Data Output Messages Notifications

	course_id integer	students_enrolled bigint
1	101	4
2	102	4
3	103	2

6. Retrieve the course with the highest number of enrollments.

```sql
SELECT course_name, COUNT(s.student_id) AS student_count
FROM students s
JOIN enrollments e
ON e.student_id = s.student_id
JOIN courses c
ON c.course_id = e.course_id
GROUP BY course_name
HAVING COUNT(e.student_id)=(
  SELECT COUNT(student_id) FROM Enrollments
  GROUP BY course_id
  ORDER BY COUNT(student_id) DESC LIMIT 1
);
```

Screenshot:

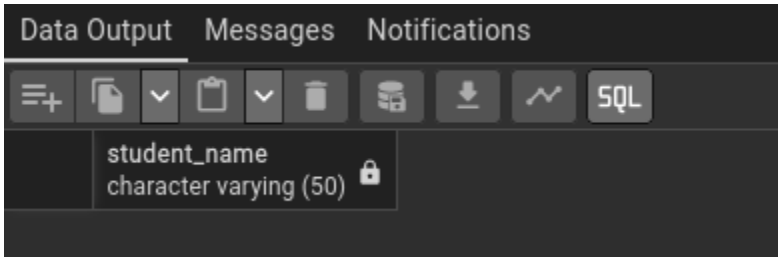
Data Output Messages Notifications

	course_name character varying (50)	student_count bigint
1	Math	4
2	Science	4

7. List students who are enrolled in all available courses.

```sql
SELECT student_name FROM students s
JOIN enrollments e
ON e.student_id = s.student_id
JOIN courses c
ON c.course_id = e.course_id
GROUP BY student_name
HAVING COUNT(e.course_id)=(
 SELECT COUNT(course_id) FROM courses
);
```

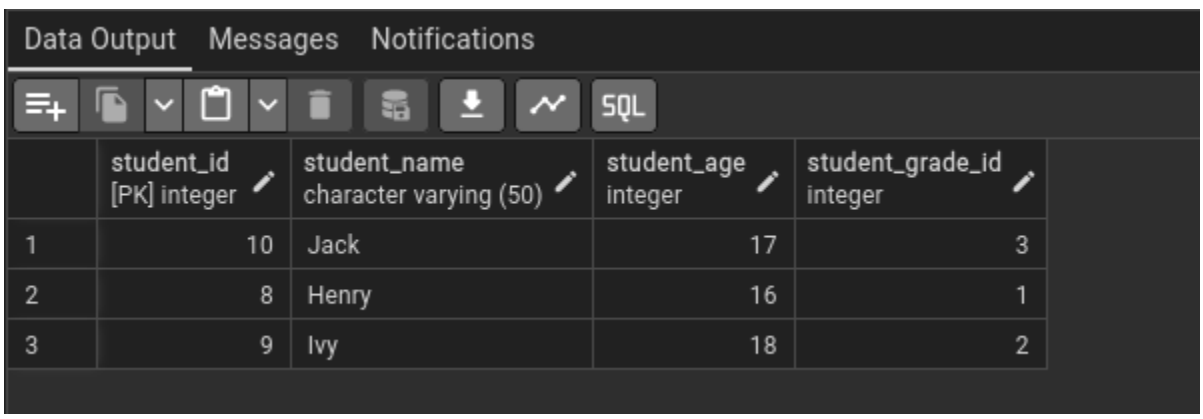
Screenshot:



8. Find students who are not enrolled in any courses.

```
SELECT
  s.*
FROM
  students s
  LEFT JOIN enrollments e ON e.student_id = s.student_id
WHERE
  e.course_id IS NULL;
```

Screenshot:



	student_id [PK] integer	student_name character varying (50)	student_age integer	student_grade_id integer
1	10	Jack	17	3
2	8	Henry	16	1
3	9	Ivy	18	2

9. Retrieve the average age of students enrolled in the Science course.

```
SELECT
  AVG(s.student_age) AS average_age
FROM
  students s
  JOIN enrollments e ON e.student_id = s.student_id
```

```
  JOIN courses c ON c.course_id = e.course_id
WHERE
  c.course_name = 'Science';
```

Screenshot:

Data Output Messages Notifications

	average_age numeric
1	16.5000000000000000

10. Find the grade of students enrolled in the History course.

```
SELECT
  s.student_name,
  c.course_name,
  g.grade_name
FROM
  students s
  JOIN enrollments e ON e.student_id = s.student_id
  JOIN courses c ON c.course_id = e.course_id
  JOIN grades g ON g.grade_id = s.student_grade_id
WHERE
  c.course_name = 'History';
```

Screenshot:

Data Output Messages Notifications

	student_name character varying (50)	course_name character varying (50)	grade_name character varying (10)
1	Charlie	History	A
2	Grace	History	B