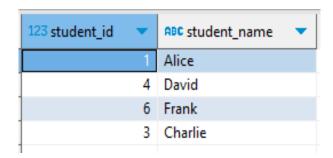```
--Queries
-- 1. Find all students enrolled in the Math course
SELECT
   student_id,
   student_name
FROM
   Students
WHERE
   student_id IN (
     SELECT
       student_id
     FROM
       Enrollments
     WHERE
       course_id IN (
         SELECT
           course_id
         FROM
           Courses
         WHERE
           course_name = 'Math'
)
 );
```

| 123 student_id | ABC student_name |
|---:|---|
| 1 | Alice |
| 4 | David |
| 6 | Frank |
| 3 | Charlie |

```
-- 2. List all courses taken by students named Bob
SELECT
   course_id,
   course_name
FROM
   Courses
WHERE
   course_id IN (
     SELECT
       course_id
     FROM
       Enrollments
```

```
     WHERE
       student_id IN (
         SELECT
           student_id
         FROM
           Students
         WHERE
           student_name = 'Bob'
       )
   );
```

123 course_id	ABC course_name
102	Science

```
-- 3. Find the names of students who are enrolled in more than one course
SELECT
  student_id,
  student_name
FROM
  Students
WHERE
  student_id IN (
    SELECT
      student_id
    FROM
      Enrollments
    GROUP BY
      student_id
    HAVING
      COUNT(*) > 1
  );
```

123 student_id	ABC student_name
1	Alice
3	Charlie
4	David

```
-- 4. List all students who are in Grade A (grade_id = 1)
SELECT
    student_id,
    student_name
FROM
    Students
WHERE
    student_grade_id = 1;
```

123 student_id	ABC student_name
1	Alice
3	Charlie
5	Eve
8	Henry

```
-- 5. Find the number of students enrolled in each course
SELECT
    course_id,
    course_name,
    (
        SELECT
            COUNT(*)
        FROM
            Enrollments
        WHERE
            course_id = Courses.course_id
    ) AS num_students
FROM
    Courses;
```

123 course_id	ABC course_name	123 num_students
101	Math	4
102	Science	4
103	History	2

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

SELECT

    course_id,

    course_name,

    (
```

```
    SELECT

        COUNT(*)

    FROM

        Enrollments

    WHERE

        course_id = Courses.course_id

  ) AS num_enrollments

FROM

  Courses

WHERE

  (

    SELECT

        COUNT(*)

    FROM

        Enrollments

    WHERE

        course_id = Courses.course_id

  ) = (

    SELECT

        MAX(enroll_count)

    FROM

        (

        SELECT

            COUNT(*) AS enroll_count

        FROM

            Enrollments

        GROUP BY

            course_id

        ) AS max_counts

  );
```

course_id	course_name	num_enrollments
101	Math	4
102	Science	4

```sql
-- 7. List students who are enrolled in all available courses
SELECT
    student_id,
    student_name
FROM
    Students
WHERE
    NOT EXISTS (
        SELECT
            course_id
        FROM
            Courses
        WHERE
            NOT EXISTS (
                SELECT
                    1
                FROM
                    Enrollments
                WHERE
                    student_id = Students.student_id
                    AND course_id = Courses.course_id
            )
    );
```

123 student_id	ABC student_name

```
-- 8. Find students who are not enrolled in any courses
SELECT
    student_id,
    student_name
FROM
    Students
WHERE
    student_id NOT IN (
        SELECT
            student_id
        FROM
            Enrollments
    );
```
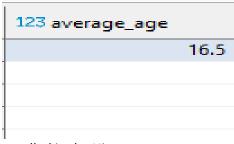
123 student_id	ABC student_name
8	Henry
9	Ivy
10	Jack

```sql
-- 9. Retrieve the average age of students enrolled in the Science course
SELECT
  AVG(student_age) AS average_age
FROM
  Students
WHERE
  student_id IN (
    SELECT
      student_id
    FROM
      Enrollments
    WHERE
      course_id IN (
        SELECT
          course_id
        FROM
          Courses
        WHERE
          course_name = 'Science'
      )
  );
```

123 average_age
16.5

```sql
-- 10. Find the grade of students enrolled in the History course
SELECT
  grade_name
FROM
  Grades
WHERE
  grade_id IN (
    SELECT
      student_grade_id
    FROM
      Students
    WHERE
      student_id IN (
        SELECT
          student_id
        FROM
          Enrollments
        WHERE
          course_id IN (
            SELECT
              course_id
```

```
        FROM
          Courses
        WHERE
          course_name = 'History'
      )
    )
);
```

ABC grade_name
A
B