

Question 1.

The screenshot shows the pgAdmin 4 interface with the 'Query Editor' tab active. The query is as follows:

```
--Question 1 Find all students enrolled in the Math course.
1 SELECT s.student_id, s.student_name, s.student_age, s.student_grade_id
2 FROM Students s
3
4 JOIN Enrollments e ON s.student_id = e.student_id
5 JOIN Courses c ON e.course_id = c.course_id
6 WHERE c.course_name = 'Math';
7
--Question 2 List all courses taken by students named Bob.
8 SELECT c.course_name
9 FROM Students s
10
11 JOIN Enrollments e ON s.student_id = e.student_id
12 JOIN Courses c ON e.course_id = c.course_id
13 WHERE s.student_name = 'Bob';
14
```

The 'Data Output' tab shows the results of the first query:

student_id	student_name	student_age	student_grade_id
1	Alice	17	1
2	Charlie	18	1
3	David	16	2
4	Frank	18	3

A green message bar at the bottom indicates: 'Successfully run. Total query runtime: 769 msec. 4 rows affected.'

Question 2.

The screenshot shows the pgAdmin 4 interface with the 'Query Editor' tab active. The query is as follows:

```
--Question 1 Find all students enrolled in the Math course.
1 SELECT s.student_id, s.student_name, s.student_age, s.student_grade_id
2 FROM Students s
3
4 JOIN Enrollments e ON s.student_id = e.student_id
5 JOIN Courses c ON e.course_id = c.course_id
6 WHERE c.course_name = 'Math';
7
--Question 2 List all courses taken by students named Bob.
8 SELECT c.course_name
9 FROM Students s
10
11 JOIN Enrollments e ON s.student_id = e.student_id
12 JOIN Courses c ON e.course_id = c.course_id
13 WHERE s.student_name = 'Bob';
14
```

The 'Data Output' tab shows the results of the second query:

course_name
Science

A green message bar at the bottom indicates: 'Successfully run. Total query runtime: 99 msec. 1 rows affected.'

Question 3.

The screenshot shows the pgAdmin 4 interface. The left sidebar displays a tree view of the database structure, with 'Tables (4)' expanded under the 'students' schema. The main pane shows the 'Query Editor' with a SQL query for 'Question 3'. The query is as follows:

```
--Question 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
GROUP BY s.student_name
HAVING COUNT(e.course_id) > 1;
```

The 'Data Output' tab shows the results of the query:

student_name
David
Alice
Charlie

A status message at the bottom right indicates: 'Successfully run. Total query runtime: 93 msec. 3 rows affected.'

Question 4.

The screenshot shows the pgAdmin 4 interface. The left sidebar displays a tree view of the database structure, with 'students' expanded under the 'Leapfrog' database. The main pane shows the 'Query Editor' with a SQL query for 'Question 4'. The query is as follows:

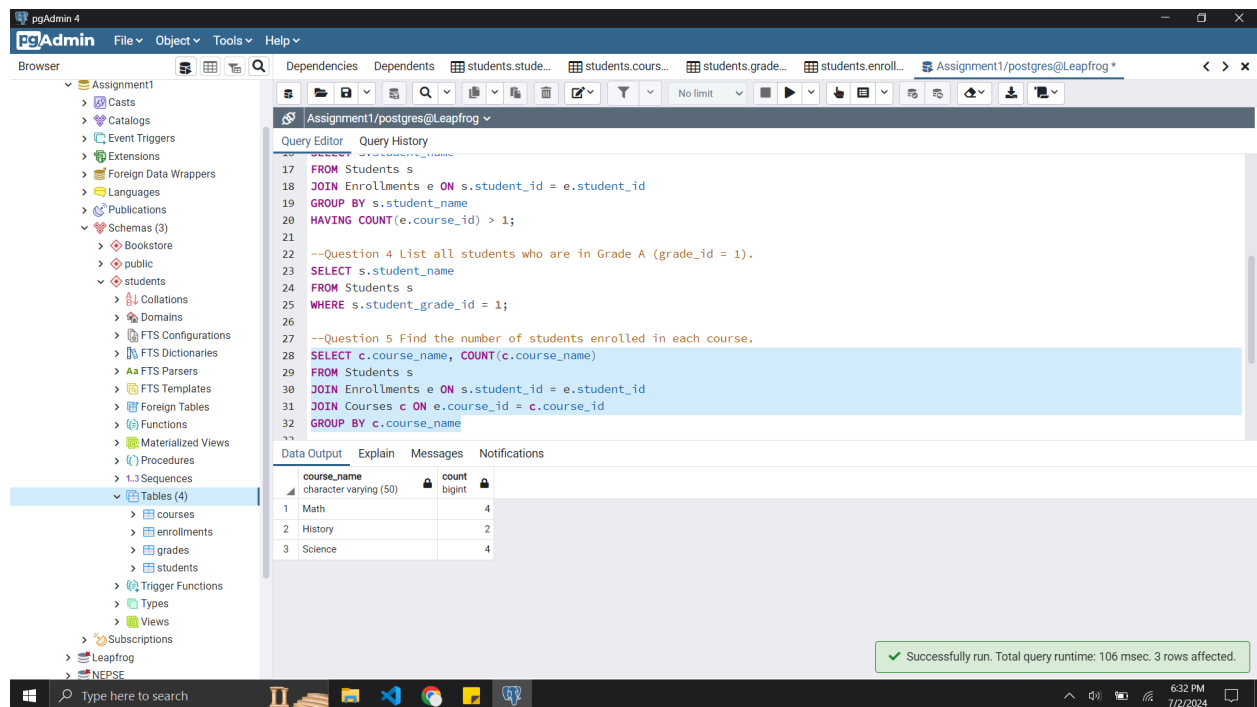
```
--Question 4 List all students who are in Grade A (grade_id = 1).
SELECT s.student_name
FROM Students s
WHERE s.student_grade_id = 1;
```

The 'Data Output' tab shows the results of the query:

student_name
Alice
Charlie
Eve
Henry

A status message at the bottom right indicates: 'Successfully run. Total query runtime: 92 msec. 4 rows affected.'

Question 5.



The screenshot shows the pgAdmin 4 interface. The left sidebar displays the database structure, with 'Tables (4)' expanded under the 'students' schema. The main pane shows the 'Query Editor' with the following SQL query:

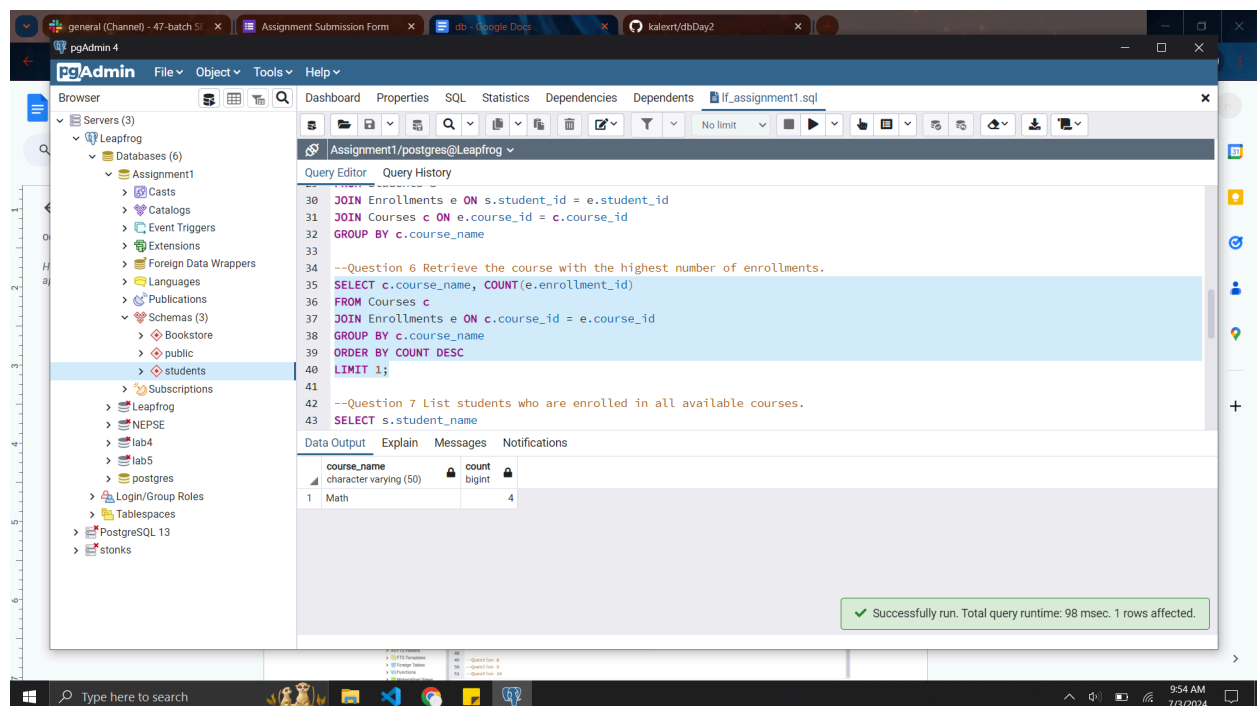
```
--Question 5 Find the number of students enrolled in each course.
SELECT c.course_name, COUNT(c.course_name)
FROM Students s
JOIN Enrollments e ON s.student_id = e.student_id
JOIN Courses c ON e.course_id = c.course_id
GROUP BY c.course_name
```

The 'Data Output' tab shows the results of the query:

course_name	count
Math	4
History	2
Science	4

A status message at the bottom indicates: 'Successfully run. Total query runtime: 106 msec. 3 rows affected.'

Question 6.



The screenshot shows the pgAdmin 4 interface. The left sidebar displays the database structure, with 'Tables (6)' expanded under the 'Assignment1' schema. The main pane shows the 'Query Editor' with the following SQL query:

```
--Question 6 Retrieve the course with the highest number of enrollments.
SELECT c.course_name, COUNT(e.enrollment_id)
FROM Courses c
JOIN Enrollments e ON c.course_id = e.course_id
GROUP BY c.course_name
ORDER BY COUNT DESC
LIMIT 1;
```

The 'Data Output' tab shows the results of the query:

course_name	count
Math	4

A status message at the bottom indicates: 'Successfully run. Total query runtime: 98 msec. 1 rows affected.'

Question 7.

The screenshot shows the pgAdmin 4 interface. The left sidebar displays a tree view of the database structure, with 'Tables (4)' expanded under the 'public' schema. The main pane shows the 'Query Editor' with the following SQL code:

```
35 SELECT c.course_name, COUNT(e.enrollment_id)
36 FROM Courses c
37 JOIN Enrollments e ON c.course_id = e.course_id
38 GROUP BY c.course_name
39 ORDER BY COUNT DESC
40 LIMIT 1;
41
42 --Question 7 List students who are enrolled in all available courses.
43 SELECT s.student_name
44 FROM Students s
45 JOIN Enrollments e ON s.student_id = e.student_id
46 GROUP BY s.student_id, s.student_name
47 HAVING COUNT(DISTINCT e.course_id) = (SELECT COUNT(*) FROM Courses);
48
49 --Question 8
50 --Question 9
51 --Question 10
```

The 'Data Output' tab is selected, showing a table with the following data:

student_name
character varying (50)

A status message at the bottom right indicates: 'Successfully run. Total query runtime: 110 msec. 0 rows affected.'

Question 8.

The screenshot shows the pgAdmin 4 interface. The left sidebar displays a tree view of the database structure, with 'Tables (4)' expanded under the 'public' schema. The main pane shows the 'Query Editor' with the following SQL code:

```
40 LIMIT 1;
41
42 --Question 7 List students who are enrolled in all available courses.
43 SELECT s.student_name
44 FROM Students s
45 JOIN Enrollments e ON s.student_id = e.student_id
46 GROUP BY s.student_id, s.student_name
47 HAVING COUNT(DISTINCT e.course_id) = (SELECT COUNT(*) FROM Courses);
48
49 --Question 8
50 SELECT s.student_name
51 FROM Students s
52 LEFT JOIN Enrollments e ON s.student_id = e.student_id
53 WHERE e.enrollment_id IS NULL;
54
55 --Question 9
56 --Question 10
```

The 'Data Output' tab is selected, showing a table with the following data:

student_name
character varying (50)
1 Jack
2 Henry
3 Ivy

A status message at the bottom right indicates: 'Successfully run. Total query runtime: 92 msec. 3 rows affected.'

Question 9.

The screenshot shows the pgAdmin 4 interface. The left sidebar displays the database structure, with 'Tables (4)' expanded under the 'students' schema. The main pane shows the 'Query Editor' with the following SQL code:

```
--Question 8
SELECT s.student_name
FROM Students s
LEFT JOIN Enrollments e ON s.student_id = e.student_id
WHERE e.enrollment_id IS NULL;

--Question 9 Retrieve the average age of students enrolled in the Science course.
SELECT AVG(s.student_age)
FROM Students s
JOIN Enrollments e ON s.student_id = e.student_id
JOIN Courses c ON e.course_id = c.course_id
WHERE course_name = 'Science';

--Question 10
```

The 'Data Output' tab shows the result of the query:

avg
16.50000000

Question 10.

The screenshot shows the pgAdmin 4 interface. The left sidebar displays the database structure, with 'Tables (4)' expanded under the 'students' schema. The main pane shows the 'Query Editor' with the following SQL code:

```
--Question 9 Retrieve the average age of students enrolled in the Science course.
SELECT AVG(s.student_age)
FROM Students s
JOIN Enrollments e ON s.student_id = e.student_id
JOIN Courses c ON e.course_id = c.course_id
WHERE course_name = 'Science';

--Question 10 Find the grade of students enrolled in the History course.
SELECT s.student_name, g.grade_name
FROM Students s
JOIN Enrollments e ON s.student_id = e.student_id
JOIN Courses c ON e.course_id = c.course_id
JOIN Grades g ON s.student_grade_id = g.grade_id
WHERE course_name = 'History';
```

The 'Data Output' tab shows the result of the query:

student_name	grade_name
Charlie	A
Grace	B

Successfully run. Total query runtime: 95 msec. 2 rows affected.