

Question 1.

The screenshot shows the pgAdmin 4 interface. The left sidebar displays the database structure, including the 'Assignment1' database. The main window shows the 'Query Editor' with the following SQL query:

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

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

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

The 'Notifications' section at the bottom indicates: "Successfully run. Total query runtime: 80 msec. 4 rows affected."

Question 2.

The screenshot shows the pgAdmin 4 interface. The left sidebar displays the database structure, including the 'Assignment1' database. The main window shows the 'Query Editor' with the following SQL query:

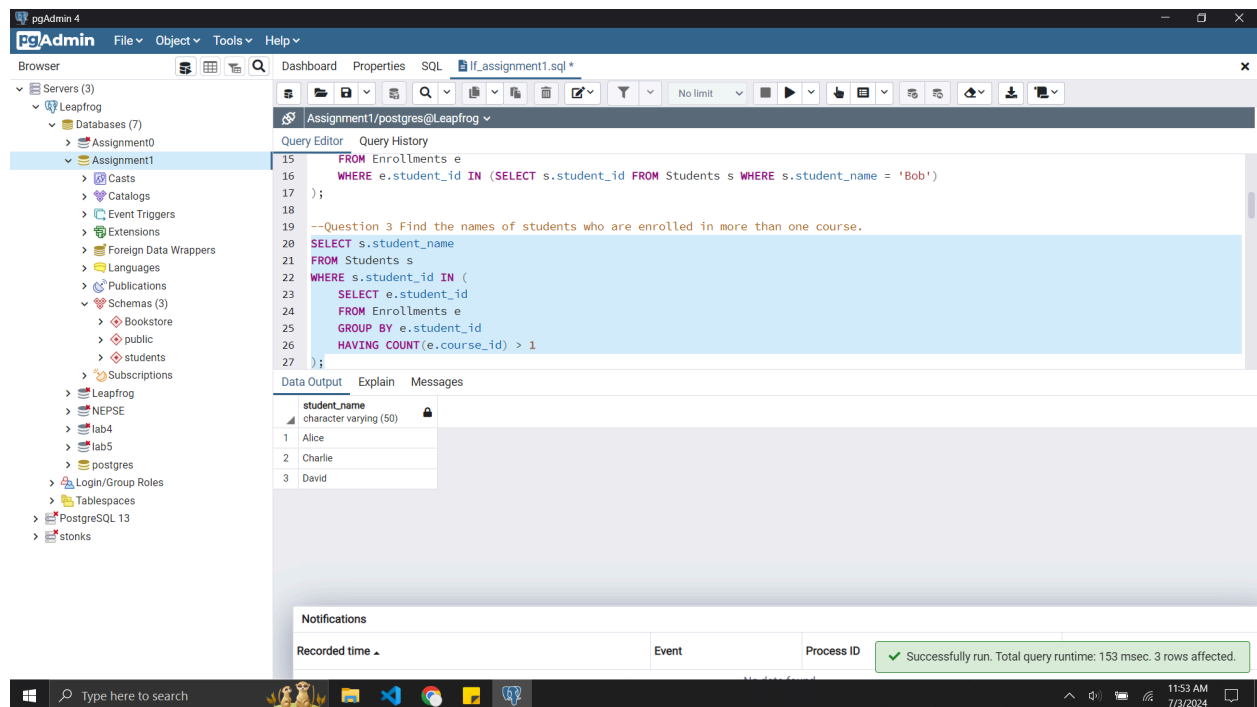
```
6 FROM Enrollments e
7 WHERE e.course_id = (SELECT c.course_id FROM Courses c WHERE c.course_name = 'Math')
8 );
9
10 --Question 2 List all courses taken by students named Bob.
11 SELECT c.course_name
12 FROM Courses c
13 WHERE c.course_id IN (
14     SELECT e.course_id
15     FROM Enrollments e
16     WHERE e.student_id IN (SELECT s.student_id FROM Students s WHERE s.student_name = 'Bob')
17 );
```

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

course_name
Science

The 'Notifications' section at the bottom indicates: "Successfully run. Total query runtime: 79 msec. 1 row affected."

Question 3.



The screenshot shows the pgAdmin 4 interface. The left sidebar displays a tree view of the database structure, including Servers (3), Leapfrog, Databases (7), Assignment0, and Assignment1. The main window shows the SQL Editor with the following query:

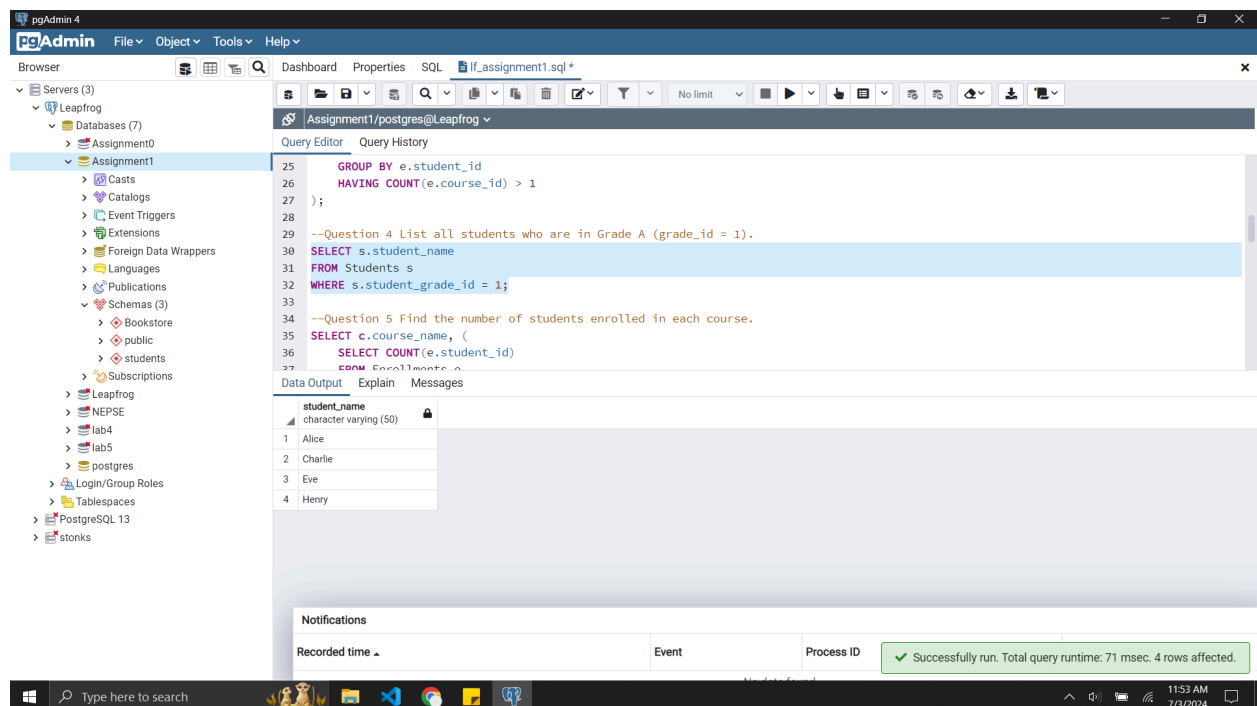
```
15 FROM Enrollments e
16 WHERE e.student_id IN (SELECT s.student_id FROM Students s WHERE s.student_name = 'Bob')
17 );
18
19 --Question 3 Find the names of students who are enrolled in more than one course.
20 SELECT s.student_name
21 FROM Students s
22 WHERE s.student_id IN (
23     SELECT e.student_id
24     FROM Enrollments e
25     GROUP BY e.student_id
26     HAVING COUNT(e.course_id) > 1
27 );
```

The Data Output tab shows the results of the query:

student_name
1 Alice
2 Charlie
3 David

The Notifications tab shows a successful run: "Successfully run. Total query runtime: 153 msec. 3 rows affected."

Question 4.



The screenshot shows the pgAdmin 4 interface. The left sidebar displays a tree view of the database structure, including Servers (3), Leapfrog, Databases (7), Assignment0, and Assignment1. The main window shows the SQL Editor with the following query:

```
25 GROUP BY e.student_id
26 HAVING COUNT(e.course_id) > 1
27 );
28
29 --Question 4 List all students who are in Grade A (grade_id = 1).
30 SELECT s.student_name
31 FROM Students s
32 WHERE s.student_grade_id = 1;
```

The Data Output tab shows the results of the query:

student_name
1 Alice
2 Charlie
3 Eve
4 Henry

The Notifications tab shows a successful run: "Successfully run. Total query runtime: 71 msec. 4 rows affected."

Question 5.

The screenshot shows the pgAdmin 4 interface. The left sidebar displays the database structure, including the 'Assignment1' database. The main window shows the SQL query editor with the following query:

```
30 SELECT s.student_name
31 FROM Students s
32 WHERE s.student_grade_id = 1;
33
34 --Question 5 Find the number of students enrolled in each course.
35 SELECT c.course_name, (
36     SELECT COUNT(e.student_id)
37     FROM Enrollments e
38     WHERE e.course_id = c.course_id
39 ) AS student_count
40 FROM Courses c;
```

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

course_name	student_count
Math	4
Science	4
History	2

The 'Notifications' section at the bottom indicates: "Successfully run. Total query runtime: 84 msec. 3 rows affected."

Question 6.

The screenshot shows the pgAdmin 4 interface. The left sidebar displays the database structure, including the 'Assignment1' database. The main window shows the SQL query editor with the following query:

```
39 ) AS student_count
40 FROM Courses c;
41
42 --Question 6 Retrieve the course with the highest number of enrollments.
43 SELECT c.course_name, (
44     SELECT COUNT(e.enrollment_id)
45     FROM Enrollments e
46     WHERE e.course_id = c.course_id
47 ) AS enrollment_count
48 FROM Courses c
49 ORDER BY enrollment_count DESC
50 LIMIT 1;
```

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

course_name	enrollment_count
Math	4

The 'Notifications' section at the bottom indicates: "Successfully run. Total query runtime: 79 msec. 1 rows affected."

Question 7.

The screenshot shows the pgAdmin 4 interface. The left sidebar displays the database structure, including the 'Leapfrog' database and its 'Assignment1' table. The main window shows the SQL query editor with the following code:

```
49 ORDER BY enrollment_count DESC
50 LIMIT 1;
51
52 --Question 7 List students who are enrolled in all available courses.
53 SELECT s.student_name
54 FROM Students s
55 WHERE (
56     SELECT COUNT(DISTINCT e.course_id)
57     FROM Enrollments e
58     WHERE e.student_id = s.student_id
59 ) = (SELECT COUNT(*) FROM Courses);
60
```

The 'Data Output' tab is selected, showing the results of the query. The results are displayed in a table with the following columns: 'student_name' (character varying (50)). The results are:

student_name
Henry
Ivy
Jack

The 'Notifications' section at the bottom shows a green message: 'Successfully run. Total query runtime: 68 msec. 0 rows affected.'

Question 8.

The screenshot shows the pgAdmin 4 interface. The left sidebar displays the database structure, including the 'Leapfrog' database and its 'Assignment1' table. The main window shows the SQL query editor with the following code:

```
59 ) = (SELECT COUNT(*) FROM Courses);
60
61 --Question 8
62 SELECT s.student_name
63 FROM Students s
64 WHERE NOT EXISTS (
65     SELECT 1
66     FROM Enrollments e
67     WHERE e.student_id = s.student_id
68 );
69 --Question 9 Retrieve the average age of students enrolled in the Science course.
70 SELECT AVG(s.student_age)
```

The 'Data Output' tab is selected, showing the results of the query. The results are displayed in a table with the following columns: 'student_name' (character varying (50)). The results are:

student_name
Henry
Ivy
Jack

The 'Notifications' section at the bottom shows a green message: 'Successfully run. Total query runtime: 117 msec. 3 rows affected.'

Question 9.

The screenshot shows the pgAdmin 4 interface with the SQL query editor open. The query is as follows:

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

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

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

avg
16.50000000

The Notifications bar at the bottom indicates: "Successfully run. Total query runtime: 98 msec. 1 rows affected."

Question 10.

The screenshot shows the pgAdmin 4 interface with the SQL query editor open. The query is as follows:

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

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

student_name	grade_name
Charlie	A
Grace	B

The Notifications bar at the bottom indicates: "Successfully run. Total query runtime: 74 msec. 2 rows affected."