Assignment 5: Practice with Subqueries

The puzzles in this assignment will involve the tables you prepared in assignment 1. You'll be using subqueries to retrieve information to solve the problems in this assignment.

In this section you'll practice working with subqueries. The questions that follow are based on the tables you created in assignment one. The image displays 3 of those tables you can use to solve the problems in this section. Reviewthese tables and understand how the data is related before moving on.

Students Table

	student_no integer	student_name character varying (20)	age integer
1	1	Michael	19
2	2	Doug	18
3	3	Samantha	21
4	4	Pete	20
5	5	Ralph	19
6	6	Arnold	22
7	7	Michael	19
8	8	Jack	19
9	9	Rand	17
10	10	Sylvia	20

Courses Table

	course_no character varying (5)	course_title character varying (20)	credits integer
1	CS110	Pre Calculus	4
2	CS180	Physics	4
3	CS107	Intro to Psychology	3
4	CS210	Art History	3
5	CS220	US History	3

Student_enrollment Table

	student_no integer	course_no character varying (5)
1	1	CS110
2	1	CS180
3	1	CS210
4	2	CS107
5	2	CS220
6	3	CS110
7	3	CS180
8	4	CS220
9	5	CS110
10	5	CS180
11	5	CS210
12	5	CS220
13	6	CS110
14	7	CS110
15	7	CS210

Questions for this assignment

1. Is the students table directly related to the courses table? Why or why not?

2. Using subqueries only, write a SQL statement that returns the names of those students that are taking the courses Physics and US History.

NOTE: Do not jump ahead and use joins. I want you to solve this problem using only what you've learned in this section.

3. Using subqueries only, write a query that returns the name of the student that is taking the highest number of courses.

NOTE: Do not jump ahead and use joins. I want you to solve this problem using only what you've learned in this section.

4. Answer TRUE or FALSE for the following statement:

Subqueries can be used in the FROM clause and the WHERE clause but cannot be used in the SELECT Clause.

5. Write a query to find the student that is the oldest. You are not allowed to use LIMIT or the ORDER BY clause to solve this problem.

Do not scroll past here without trying out the assignment yourself

Instructor Solutions for this assignment

1. Is the students table directly related to the courses table? Why or why not?

The students table is not directly related to the courses table. The students table just contains student details. The courses table just contains courses information. The table that relates both the students table and courses table is the student_enrollment table. What student is enrolled in what course is captured in the student_enrollment table.

2. Using subqueries only, write a SQL statement that returns the names of those students that are taking the courses Physics and US History.

NOTE: Do not jump ahead and use joins. I want you to solve this problem using only what you've learned in this section.

```
SELECT student_name

FROM students WHERE student_no

        IN (SELECT student_no

          FROM student_enrollment

          WHERE course_no

          IN ( SELECT course_no

            FROM courses

            WHERE course_title

              IN ('Physics', 'US History')));
```

3. Using subqueries only, write a query that returns the name of the student that is taking the highest number of courses.

NOTE: Do not jump ahead and use joins. I want you to solve this problem using only what you've learned in this section.

```
SELECT student_name FROM students WHERE student_no IN (     SELECT student_no FROM (
SELECT student_no, COUNT(course_no) course_cnt        FROM STUDENT_ENROLLMENT
 GROUP BY student_no        ORDER BY course_cnt desc        LIMIT 1     )a )
```

4. Answer TRUE or FALSE for the following statement:

Subqueries can be used in the FROM clause and the WHERE clause but cannot be used in the SELECT Clause.

FALSE. Subqueries can be used in the FROM, WHERE, SELECT and even the HAVING clause.

5. Write a query to find the student that is the oldest. You are not allowed to use LIMIT or the ORDER BY clause to solve this problem.

```
SELECT *

FROM students

WHERE age = (SELECT MAX(age) FROM students)
```