Nabin Thapa - 17 (I)Database Day 2 - Assignment

Part 1:

```sql
CREATE SCHEMA IF NOT EXISTS assignment2;
-- Grades table
CREATE TABLE assignment2.Grades (
   grade_id INT PRIMARY KEY,
   grade_name VARCHAR(10)
);
-- Students table
CREATE TABLE assignment2.Students (
   student_id INT PRIMARY KEY,
   student_name VARCHAR(50),
   student_age INT,
   student_grade_id INT,
   FOREIGN KEY (student_grade_id) REFERENCES assignment2.Grades(grade_id)
);
-- Courses table
CREATE TABLE assignment2.Courses (
   course_id INT PRIMARY KEY,
   course_name VARCHAR(50)
);
-- Enrollments table
CREATE TABLE assignment2.Enrollments (
   enrollment_id INT PRIMARY KEY,
   student_id INT,
   course_id INT,
   enrollment_date DATE,
   FOREIGN KEY (student_id) REFERENCES assignment2.Students(student_id),
   FOREIGN KEY (course_id) REFERENCES assignment2.Courses(course_id)
);
```

```sql
-- Insert into Grades table
INSERT INTO assignment2.Grades (grade_id, grade_name) VALUES
(1, 'A'),
(2, 'B'),
(3, 'C');
-- Insert into Courses table
INSERT INTO assignment2.Courses (course_id, course_name) VALUES
(101, 'Math'),
(102, 'Science'),
(103, 'History');
-- Insert into Students table
INSERT INTO assignment2.Students (student_id, student_name, student_age,
student_grade_id) VALUES
```

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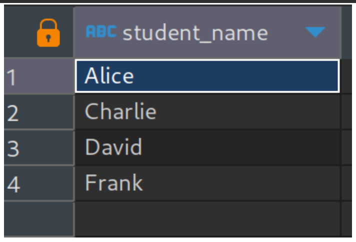
```sql
(1, 'Alice', 17, 1),
(2, 'Bob', 16, 2),
(3, 'Charlie', 18, 1),
(4, 'David', 16, 2),
(5, 'Eve', 17, 1),
(6, 'Frank', 18, 3),
(7, 'Grace', 17, 2),
(8, 'Henry', 16, 1),
(9, 'Ivy', 18, 2),
(10, 'Jack', 17, 3);
-- Insert into Enrollments table
INSERT INTO assignment2.Enrollments (enrollment_id, student_id, 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');
```

Questions:

1. Find all students enrolled in the Math course.

```sql
SELECT student_name FROM assignment2.Students s
JOIN assignment2.Enrollments e
ON e.student_id = s.student_id
JOIN assignment2.Courses c
ON c.course_id = e.course_id
WHERE course_name = 'Math';
```



	student_name
1	Alice
2	Charlie
3	David
4	Frank

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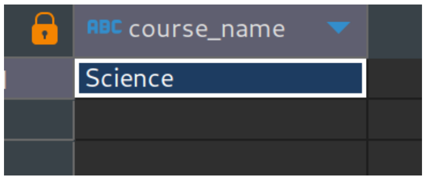
2. List all courses taken by students named Bob.

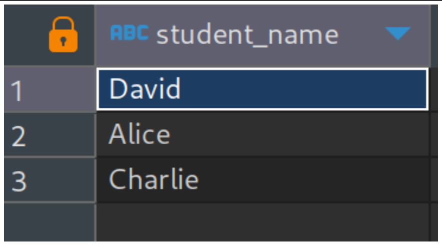
```
SELECT * FROM assignment2.Students s
JOIN assignment2.Enrollments e
ON e.student_id = s.student_id
JOIN assignment2.Courses c
ON c.course_id = e.course_id
WHERE student_name = 'Bob';
```



```
course_name
Science
```

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

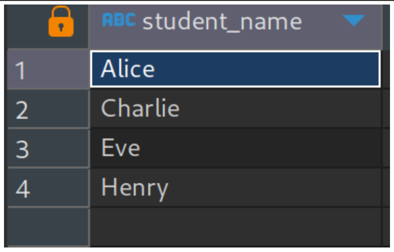
```
SELECT student_name FROM assignment2.Students s
JOIN assignment2.Enrollments e
ON e.student_id = s.student_id
GROUP BY s.student_name
HAVING COUNT(course_id) > 1;
```



```
  student_name
1 David
2 Alice
3 Charlie
```

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

```
SELECT student_name FROM assignment2.Students s
JOIN assignment2.Grades g
ON s.student_grade_id = g.grade_id
WHERE grade_name='A';
```



```
  student_name
1 Alice
2 Charlie
3 Eve
4 Henry
```

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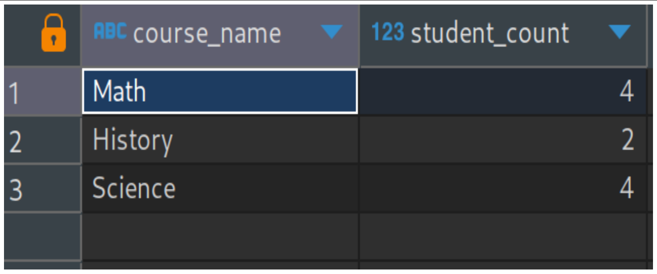
5. Find the number of students enrolled in each course.

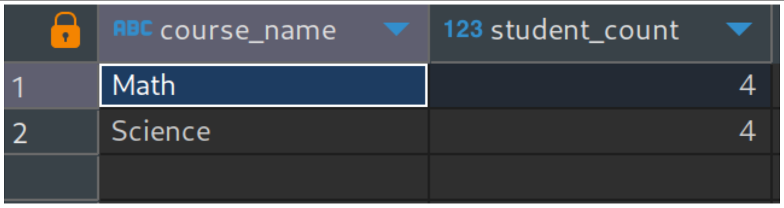
```sql
SELECT course_name, COUNT(s.student_id) AS student_count
FROM assignment2.Students s
JOIN assignment2.Enrollments e
ON e.student_id = s.student_id
JOIN assignment2.Courses c
ON c.course_id = e.course_id
GROUP BY course_name;
```



	course_name	student_count
1	Math	4
2	History	2
3	Science	4

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

```sql
SELECT course_name, COUNT(assignment2.Students.student_id) AS student_count
FROM assignment2.Students s
JOIN assignment2.Enrollments e
ON e.student_id = s.student_id
JOIN assignment2.Courses c
ON c.course_id = e.course_id
GROUP BY course_name
HAVING COUNT(e.student_id)=(
 SELECT COUNT(student_id) FROM assignment2.Enrollments
 GROUP BY course_id
 ORDER BY COUNT(student_id) DESC LIMIT 1
);
```



	course_name	student_count
1	Math	4
2	Science	4

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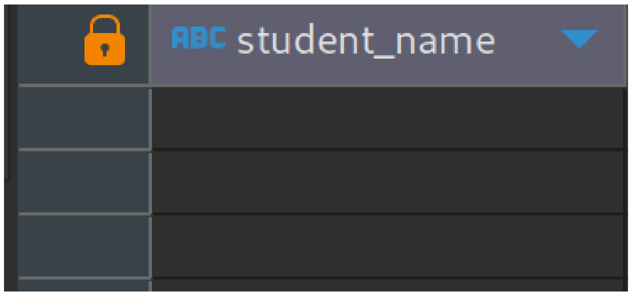
7. List students who are enrolled in all available courses.

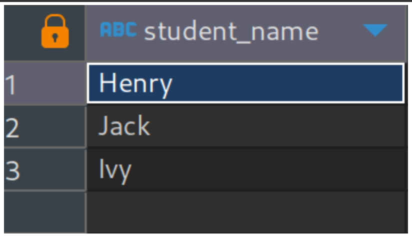
```sql
SELECT student_name FROM assignment2.Students s
JOIN assignment2.Enrollments e
ON e.student_id = s.student_id
JOIN assignment2.Courses c
ON c.course_id = e.course_id
GROUP BY student_name
HAVING COUNT(e.course_id)=(
 SELECT COUNT(course_id) FROM assignment2.Courses
);
```



student_name

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

```sql
SELECT student_name FROM assignment2.Students s
LEFT JOIN assignment2.Enrollments e
ON e.student_id = s.student_id
GROUP BY student_name
HAVING COUNT(e.course_id)=0;
```



	student_name
1	Henry
2	Jack
3	Ivy

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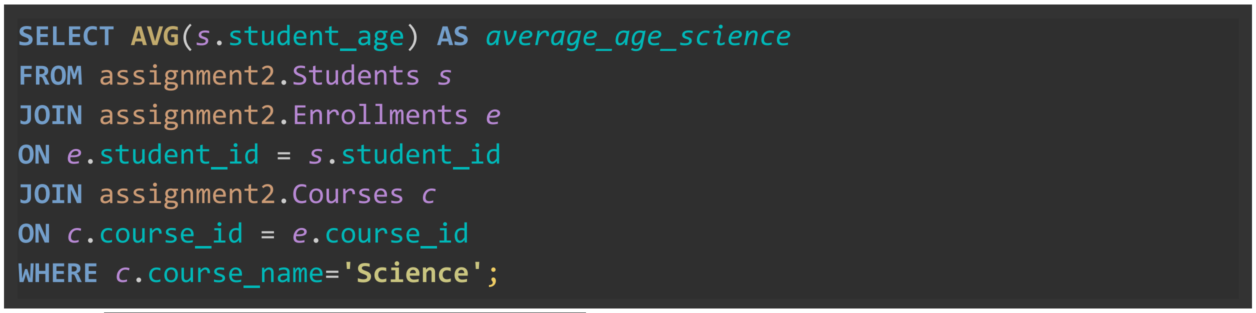
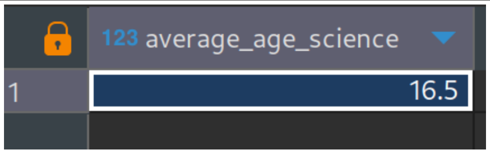
9. Retrieve the average age of students enrolled in the Science course.

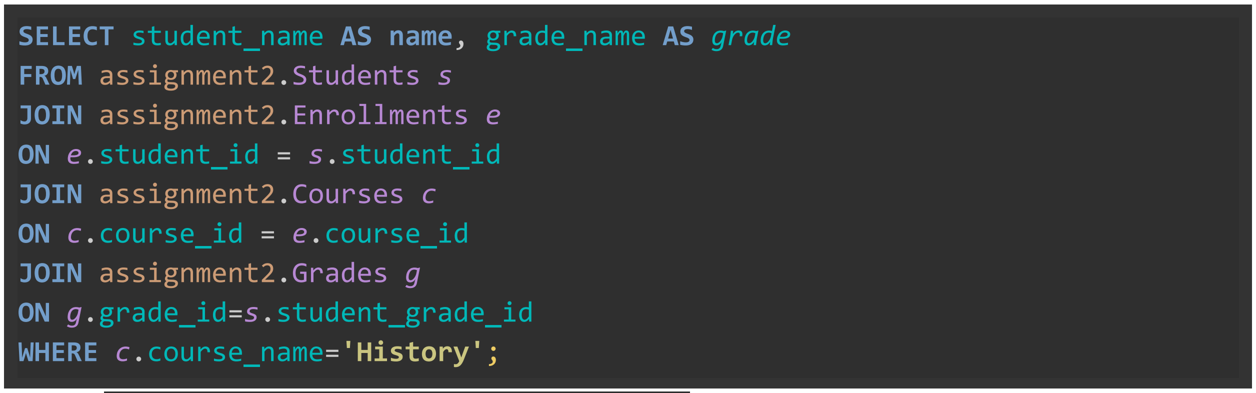


```
SELECT AVG(s.student_age) AS average_age_science
FROM assignment2.Students s
JOIN assignment2.Enrollments e
ON e.student_id = s.student_id
JOIN assignment2.Courses c
ON c.course_id = e.course_id
WHERE c.course_name='Science';
```

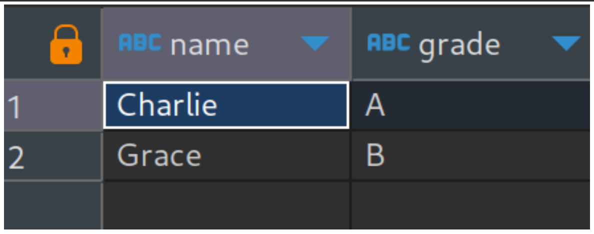


	average_age_science
1	16.5

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



```
SELECT student_name AS name, grade_name AS grade
FROM assignment2.Students s
JOIN assignment2.Enrollments e
ON e.student_id = s.student_id
JOIN assignment2.Courses c
ON c.course_id = e.course_id
JOIN assignment2.Grades g
ON g.grade_id=s.student_grade_id
WHERE c.course_name='History';
```



	name	grade
1	Charlie	A
2	Grace	B

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2. Please design and create the necessary tables (Books, Authors, Publishers, Customers, Orders, Book_Authors, Order_Items) for an online bookstore database. Ensure each table includes appropriate columns, primary keys, and foreign keys where necessary. Consider the relationships between these tables and how they should be defined.

```
CREATE SCHEMA IF NOT EXISTS assignment2;

CREATE TABLE IF NOT EXISTS assignment2.publishers(
	publisher_id INT PRIMARY KEY,
	publisher_name VARCHAR(100),
	country VARCHAR(50)
);

CREATE TABLE IF NOT EXISTS assignment2.books(
	book_id INT PRIMARY KEY,
	title vARCHAR(100),
	genre VARCHAR(50),
	publisher_id INT,
	publication_year DATE,
	FOREIGN KEY(publisher_id) REFERENCES assignment2.publishers(publisher_id)
);

CREATE TABLE IF NOT EXISTS assignment2.customers(
	customer_id INT PRIMARY KEY,
	customer_name VARCHAR(50) NOT NULL,
	email VARCHAR(150) UNIQUE,
	address VARCHAR(50)
);

CREATE TABLE IF NOT EXISTS assignment2.authors(
	author_id INT PRIMARY KEY,
	author_name VARCHAR(50) NOT NULL,
	birth_date DATE,
	nationality VARCHAR(50)
);

CREATE TABLE IF NOT EXISTS assignment2.orders(
	order_id INT PRIMARY KEY,
	order_date DATE DEFAULT CURRENT_DATE,
	customer_id INT,
	total_amount INT DEFAULT 1,
	FOREIGN KEY(customer_id) REFERENCES assignment2.customers(customer_id)
);
```

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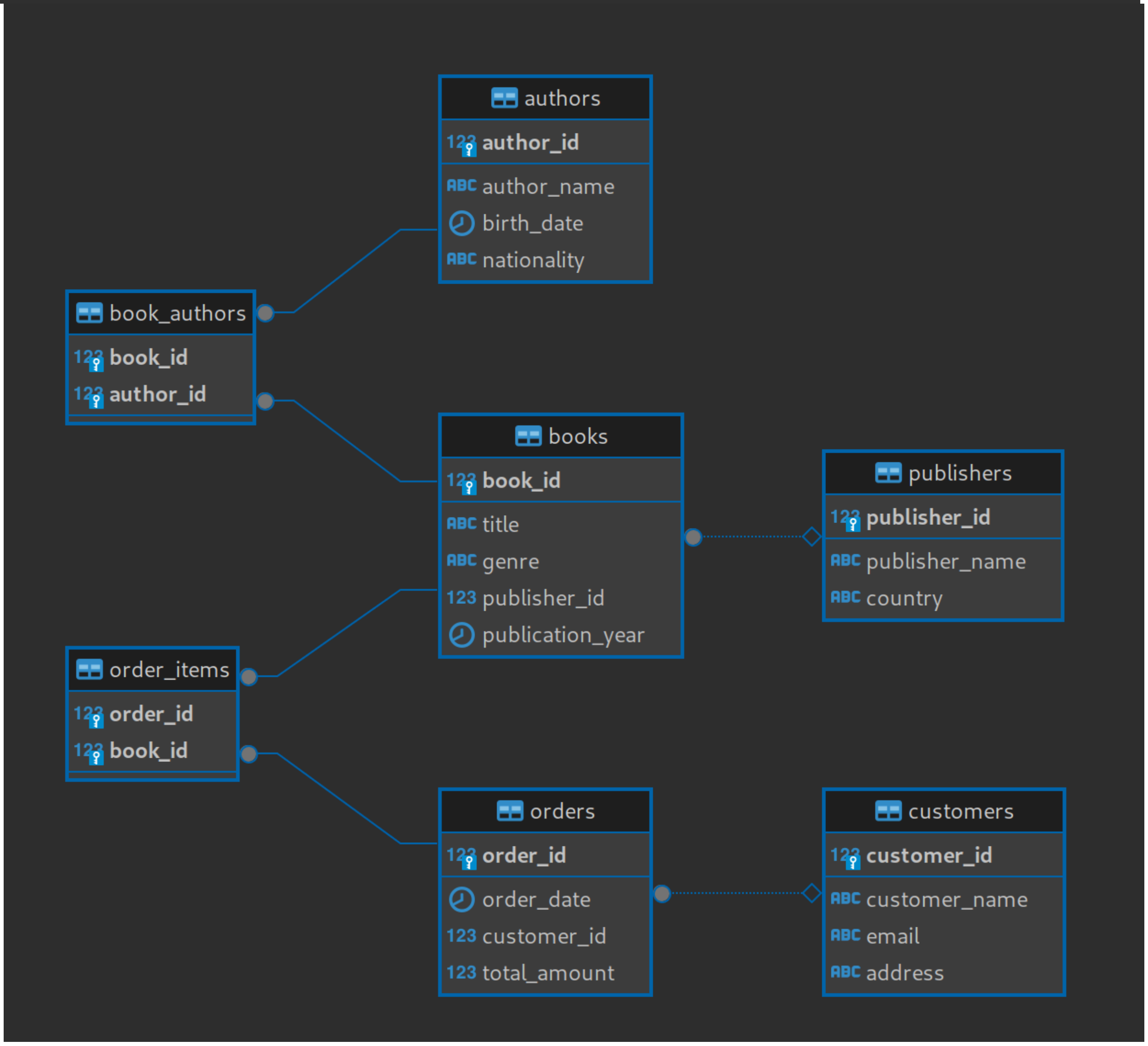
```
CREATE TABLE IF NOT EXISTS assignment2.book_authors(
	book_id INT,
	author_id INT,
	PRIMARY KEY(book_id, author_id),
	FOREIGN KEY(book_id) REFERENCES assignment2.books(book_id),
	FOREIGN KEY(author_id) REFERENCES assignment2.authors(author_id)
);

CREATE TABLE IF NOT EXISTS assignment2.order_items(
	order_id INT,
	book_id INT,
	PRIMARY KEY(order_id, book_id),
	FOREIGN KEY(book_id) REFERENCES assignment2.books(book_id),
	FOREIGN KEY(order_id) REFERENCES assignment2.orders(order_id)
);
```



authors
author_id
author_name
birth_date
nationality
book_authors
book_id
author_id
books
book_id
title
genre
publisher_id
publication_year
publishers
publisher_id
publisher_name
country
order_items
order_id
book_id
orders
order_id
order_date
customer_id
total_amount
customers
customer_id
customer_name
email
address