Giving a database schema:

- Sailors(sid: *integer*, sname: *string*, rating: *integer*, age:*real*)
- Boats(bid:*integer* , bname: *string*, color: *string*)
- Reserves(sid: *integer*, bid: *integer* , day: *date*)

Sid	*Sname*	*Rating*	*Age*
22	Dustin	7	45.0
29	Brutus	1	33.0
31	Lubber	8	55.5
32	Andy	8	25.5
58	Rusty	10	35.0
64	Horatio	7	35.0
71	Zorba	10	16.0
74	Horatio	9	35.0
85	Art	3	25.5
95	Bob	3	63.5

Sailors

Sid	*Bid*	*Day*
22	101	10/10/08
22	102	10/10/08
22	103	10/08/08
22	104	10/07/08
31	102	11/10/08
31	103	11/06/08
31	104	11/12/08
64	101	9/05/08
64	102	9/08/08
74	103	9/08/08

Reserves

Bid	*Bname*	*Color*
101	Interlake	Blue
102	Interlake	Red
103	Clipper	Green
104	Marine	Red

Boats

Using relational algebra expression to answer below queries

Group1.

1. Find the names of sailors who have reserved boat 103
2. Find the names of sailors who have reserved a red boat
3. Find the colors of boats reserved by Lubber.
4. Find the names of sailors who have reserved at least one boat.
5. Find the names of sailors who have reserved a red or a green boat

Group 2.

6. Find the names of sailors who have reserved a red and a green boat
7. Find the sids of sailors with age over 20 who have not reserved a red boat
8. Find the names of sailors who have reserved all boats
9. Find the names of sailors who have reserved all boats called Interlake
10. Find the names of sailors who have reserved at least two boats

Assume the following relations:

- BOOKS(DocId, Title, Publisher, Year)
- STUDENTS(StId, StName, Major, Age)
- AUTHORS(AName, Address)
- borrows(DocId, StId, Date)
- has-written(DocId, AName)
- describes(DocId, Keyword)

Group 3.

1. List the year and title of each book

2. List all students with the books they can borrow
3. List all books published by McGraw-Hill before 1990
4. List the names of all students who have borrowed a book and
who are CS majors
5. Find the name of the youngest student

Group 4.
1. List the name of those authors who are living in Davis
2. List the name of students who are older than 30 and who are
not studying CS
3. Rename AName in the relation AUTHORS to Name
4. Find the title of the oldest book
5. List the authors of the books the student 'Smith' has borrowed

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Write relational algebra expressions for the following nine queries:
Person (name, age, gender)
name is a key
Frequents (name, pizzeria)
(name, pizzeria) is a key
Eats (name, pizza)
(name, pizza) is a key
Serves (pizzeria, pizza, price)
(pizzeria, pizza) is a key

Group 5.
1. Find all pizzerias frequented by at least one person under the age of 18.
2. Find the names of all females who eat either mushroom or pepperoni pizza (or both).
3. Find the names of all females who eat both mushroom and pepperoni pizza.
4. Find all pizzerias that serve at least one pizza that Amy eats for less than $10.00.
5. Find all pizzerias that are frequented by only females or only males.

Group 6.

1. For each person, find all pizzas the person eats that are not served by any pizzeria the person frequents. Return all such person (name) / pizza pairs.
2. Find the names of all people who frequent only pizzerias serving at least one pizza they eat.
3. Find the names of all people who frequent every pizzeria serving at least one pizza they eat.
4. Find the pizzeria serving the cheapest pepperoni pizza. In the case of ties, return all of the cheapest-pepperoni pizzerias.