

Relational Algebra Exercises

February 28, 2019

Consider the Sailors-Boats-Reserves database described in the following.

- **S(sid,sname,rating,age)**
- **B(bid,bname,color)**
- **R(sid,bid,date)**

Give a relational algebra expression for each of the following operations:

- 1 Find the colors of boats reserved by Albert.
- 2 Find all sailor id's of sailors who have a rating of at least 8 or reserved boat 103.

- **S(sid,sname,rating,age)**

- **B(bid,bname,color)**

- **R(sid,bid,date)**

3 Find the names of sailors who have not reserved a red boat.

4 Find the sailor id's of sailors with age over 20 who have not reserved a red boat.

5 Find the names of sailors who have reserved at least two boats.

- **S(sid,sname,rating,age)**

- **B(bid,bname,color)**

- **R(sid,bid,date)**

6 Find the names of sailors who have reserved all boats.

7 Find the names of sailors who have reserved all boats called BigBoat.

8 Find the sailor id's of sailors whose rating is better than some sailor called Bob.

- **S(sid,sname,rating,age)**

- **B(bid,bname,color)**

- **R(sid,bid,date)**

9 Find the sailor id's of sailors whose rating is better than every sailor called Bob.

10 Find the sailor id's of sailors with the highest rating.

Consider the following collection of relation schemes:

- **professor(profname,deptname)**
- **department(deptname,building)**
- **committee(commname,profname)**

- 1 Find the committees which have some member from the ECE department.
- 2 Find all the professors who are in any one of the committees that Professor Smith is in.

- professor(profname,deptname)
- department(deptname,building)
- committee(commname,profname)

- **professor(profname,deptname)**
 - **department(deptname,building)**
 - **committee(commname,profname)**
- 3** Find all the professors who are in at least all those committees that Professor Smith is in.

- **professor(profname,deptname)**
- **department(deptname,building)**
- **committee(commname,profname)**

4 Find all the professors who are in exactly (i.e., no more and no less) all those committees that Professor Smith is in.

- **professor(profname,deptname)**
 - **department(deptname,building)**
 - **committee(commname,profname)**
- 5 Find all the professors who have offices in at least all those buildings that Professor Smith has offices in (a professors offices are in the building in which her/his department is in).