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11/5/2023

CS300-ON

Assignment 2

**Writing Queries using Relational Algebra**

1. List only the name and rating for all Sailors. **(4 points)**
   1. π(sname, rating)(S)
2. List all sailor information for sailors with a rating>8).  **(4 points)**
   1. σ(rating > 8)(S)
3. List the boat id for boats all red boats.  **(4 points)**
   1. π(bid)(σ(color = 'red')(Boats))
4. List the boat id for all red boats and all green boats.  **(4 points)**
   1. π(bid)(σ(color = 'red')(Boats) ⋃ σ(color = 'green')(Boats))
5. List the name of every sailor who is aged 16 or under.  **(4 points)**
   1. π(sname)(σ(age <= 16)(Sailors))
6. List the name and rating for all sailors who have a rating of 7 and below.  **(4 points)**
   1. π(sname, rating)(σ(rating <= 7)(Sailors))
7. Count the number of reservations for boat number 4.  **(4 points)**
   1. |σ(bid = 4)(Reserves)|
8. Find the names of sailors who have reserved boat 103.  **(4 points)**
   1. π(sname)(σ(bid = 103)(Reserves ⋈ Sailors))
9. Find the names of sailors who have reserved a red boat.  **(4 points)**
   1. π(sname)(σ(color = 'red')(Boats) ⋈ Reserves ⋈ Sailors)
10. Find the colors of the boats reserved by Lubber.  **(4 points)**
    1. π(color)(σ(sname = 'Lubber')(Sailors) ⋈ Reserves ⋈ Boats)
11. Find the names of sailors who have reserved a red and green boat.  **(5 points)**
    1. π(sname)(σ(color = 'red')(Boats) ⋈ σ(color = 'green')(Boats) ⋈ Reserves ⋈ Sailors)
12. Find the names of sailors with age over 20 who have not reserved a red boat.  **(5 points)**
    1. π(sname)(σ(age > 20)(Sailors) - (σ(color = 'red')(Boats) ⋈ Reserves ⋈ Sailors))