

10/10 Questions Answered

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Quiz 4

STUDENT NAME

Q1 Try to Relax :-)

10 Points

This quiz is intended to be done (for fun!) before the pre-midterm discussion sections on the relational algebra. You will use the Relax relational algebra calculator - the same one that you will be using for the next HW assignment - to answer a series of queries over the Sailors/Boats/Reserves data that have been used in the lectures. This will help ensure that you get off to a successful start with the algebra and get some pre-HW practice. (The URL for the online Relax relational algebra calculator is <https://dbis-uibk.github.io/relax/calc/local/uibk/local/0> and the gist identifier to use in Relax for the relevant data is 9aa882b7295d64737b8330978c3e0658).

Relax - relational algebra calculator 0.18.2 Language ▾ Take a Tour Feedback Help

Wisconsin Sailing C... ▾ Relational Algebra SQL Group Editor

Sailors
 sid number
 sname string
 rating number
 age number

Boats
 bid number
 bname string
 color string

Reserves
 sid number
 bid number
 date date

$\pi \sigma \rho \leftarrow \tau \gamma \wedge \vee \neg = \neq \leq \geq \cap \cup \div - \times \bowtie \ltimes \rtimes \times \triangleright = \cdot / \{ \}$

1 | your query goes here ...

keyboard shortcuts:
 execute statement: [CTRL]+[RETURN]
 execute selection: [CTRL]+[SHIFT]+[RETURN]
 autocomplete: [CTRL]+[SPACE]

▶ execute query download history ▾

Q1.1

1 Point

Find all the sailors whose name is Horatio.

$$\sigma \text{ sname} = \text{'Horatio'} \text{ (Sailors)}$$

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1 Point

Print (just) the sailor ids, ratings, and ages of sailors whose name is Horatio.

$$\pi \text{ sid, rating, age } (\sigma \text{ sname} = \text{'Horatio'} \text{ (Sailors)})$$

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1 Point

Print the reservations for sailors whose name is Horatio.

$$\pi \text{ sid, bid, date } ((\text{Reserves}) \bowtie (\sigma \text{ sname} = \text{'Horatio'} \text{ (Sailors)}))$$

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1 Point

Print the names and colors of boats reserved by a sailor whose name is Horatio.

$$\pi \text{ bname, color } (\text{Boats} \bowtie \text{Boats.bid} = \text{horatio_reservations.bid } (\rho \text{ horatio_reservations } (\pi \text{ Reserves.sid, Reserves.bid, Reserves.date}$$

$((\text{Reserves}) \bowtie \text{Reserves.sid} = \text{Horatio.sid} \ \rho \ \text{Horatio} \ (\sigma \ \text{sname} = \text{'Horatio'} \ (\text{Sailors}))))))$

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Q1.5

1 Point

Print the ids of sailors who have reserved all of the non-red boats.

$(\pi \text{ sid}, \text{bid} \ (\text{Reserves})) \div (\pi \text{ bid} \ \sigma \text{color} \neq \text{'red'} \ (\text{Boats}))$

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Q1.6

1 Point

Print the names and ages of sailors who have reserved all of the non-red boats.

$\pi \text{ sname}, \text{age} \ (((\pi \text{ sid}, \text{bid} \ (\text{Reserves})) \div (\pi \text{ bid} \ \sigma \text{color} \neq \text{'red'} \ (\text{Boats})))) \bowtie \text{Sailors}$

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Q1.7

1 Point

Print the names of sailors who have a rating of three or less **or** who are over 40 years old. (Use **only** selection and projection.)

$\pi \text{ sname} \ (\sigma \text{rating} \leq 3 \ \vee \ \text{age} > 40 \ (\text{Sailors}))$

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Q1.8

1 Point

Print the names of sailors who have a rating of three or less **or** who are over 40 years old. (This time use only **simple predicates** and use union.)

```
low_rating =  $\sigma$  rating  $\leq$  3 (Sailors)
older_sailors =  $\sigma$  age > 40 (Sailors)
 $\pi$  sname (low_rating  $\cup$  older_sailors)
```

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Q1.9

1 Point

Print the names of sailors who have a rating of three or less **and** who are over 40 years old. (Use only selection and projection.)

```
 $\pi$  sname ( $\sigma$  rating  $\leq$  3  $\wedge$  age > 40 (Sailors))
```

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Q1.10

1 Point

Print the names of sailors who have a rating of 6 or more **and** who are over 40 years old **and** who have reserved all of the non-red boats. (Hints: You can use assignment to combine steps from earlier - being careful to operate on keys, i.e., sailor ids, to avoid false answers in the event of duplicate names. Name the final result's column name "busy_sailors".)

```
sailors_nonred = (πsid,bid (Reserves))÷(πbid σcolor≠'red' (Boats))  
ρ busy_sailors ← sname (π sname ((σ rating ≥ 6 ∧ age > 40  
(Sailors)) ⋈ sailors_nonred))
```

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