10/10 Questions Answered
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Quiz 5

STUDENT NAME

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Q1 Relational Calculus (and a little SQL)

10 Points

This quiz is intended to be done prior to the start of this week's discussion sessions. Since you'll get tons of practice with SQL in the next two HW assignments, this quiz will give you a chance to try the tuple relational calculus (TRC) instead - though we'll toss in a little SQL in spots. All of the entry boxes are free-text entry boxes - use this as a worksheet to try your hand at last week's queries in this week's query language! (Remember, you will ultimately receive full credit simply for attempting the quiz, i.e., for giving it your best shot, so you have nothing to lose by trying.) Your TA will go over the solutions in the discussion - in real-time if you are there, or on the video if you consume discussion material that way.

Here's a set of potentially helpful symbols to cut/paste from: ∃ ∄ ∀ ∈ ∉ ¬ ∧ ∨ ⇒ = ≠ < > ≤ ≥

Roll up your sleeves and ready your TRC skills...!

Q1.1

1 Point

Find all the sailors whose name is Horatio.

```
{ s | SOME s IN Sailors(s.sname = 'Horatio') }
```

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Q1.2

1 Point

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

```
{ t(sid, rating, age) | SOME s IN Sailors (t.sid = s.sid AND t.rating =
s.rating AND t.age = s.age AND s.sname = 'Horatio') }
```

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Q1.3

1 Point

Print the reservations for sailors who name is Horatio.

```
 { r | SOME r IN Reserves (
SOME s IN Sailors ( r.sid = s.sid AND s.sname = 'Horatio' )
)}
```

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Q1.4

1 Point

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

```
 { t(bname, color) | SOME b IN Boats (
t.bname = b.bname AND t.color = b.color AND SOME r IN Reserves
(r.bid = b.bid AND SOME s IN Sailors (
r.sid = s.sid AND s.sname = 'Horatio'
))) }
```

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Q1.5

1 Point

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

```
{ t(sid) | SOME s IN Sailors (
s.sid = t.sid AND ALL b IN Boats (
b.color != 'red' IMPLIES SOME r IN Reserves ( r.bid = b.bid AND r.sid
= s.sid
))) }
```

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Q1.6

1 Point

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

```
{ t(sname, age) | SOME s IN Sailors (
s.sname = t.sname AND s.age = t.age AND ALL b IN Boats (
b.color != 'red' IMPLIES SOME r IN Reserves ( r.bid = b.bid AND r.sid
= s.sid
))))}
```

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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.

```
{ t(sname) | SOME s IN Sailors (
t.sname = s.sname AND (s.rating <= 3 OR s.age > 40)
)}
```

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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. (*Write this one in SQL!*)

```
SELECT S.sname
FROM Sailors S
WHERE S.rating <= 3 OR S.age > 40
```

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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.

```
{ t(sname) | SOME s IN Sailors (
t.sname = s.sname AND s.rating <= 3 AND s.age > 40
)}
```

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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.

Name the final result's column name "busy_sailors".

```
{ t(sname) | SOME s IN Sailors (
t.sname = s.sname AND s.rating >= 6 AND s.age > 40 AND
ALL b IN Boats (
b.color != 'red' IMPLIES SOME r IN Reserves ( r.bid = b.bid AND r.sid
= s.sid
))
)}
```

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