CSE 132a Written HW 1

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1)(i) $\{a: day \mid \exists d \in all\ days\ (d(day) = a(day) \wedge \forall r \in res\ (r(day) = d(day) \rightarrow \exists b \in boat\ (b(bname) = r(bname) \wedge b(color) = "red")))\}$

2)(i) $\{a: day \mid \exists d \in all\ days\ (d(day) = a(day) \wedge \forall b \in boat\ (b(color) = "red" \wedge \forall r \in res\ (r(day) = d(day) \rightarrow \exists r \in res\ (r(bname) = b(bname)))))\}$

1)(ii) $\{a: day \mid \exists d \in all\ days\ (d(day) = a(day) \wedge \neg\exists r \in res\ (r(day) = d(day) \wedge \neg\exists b \in boat\ (b(bname) = r(bname) \wedge b(color) = "red")))\}$

2)(ii) $\{a: day \mid \exists d \in all\ days\ (d(day) = a(day) \wedge \neg\exists b \in boat\ (b(color) <> "red" \vee \exists r \in res\ (r(day) = d(day) \vee \exists r \in res\ (r(bname) = b(bname)))))\}$

1)(iii)
```
SELECT d.day FROM alldays d
WHERE NOT EXISTS ( SELECT * FROM Reservation r
                   WHERE r.bname = d.day
                   AND NOT EXISTS ( SELECT * FROM Boat b
                                    WHERE b.bname = r.bname
                                    AND b.color = 'red' ))
```

2)(iii)
```
SELECT d.day FROM alldays d
WHERE NOT EXISTS ( SELECT * FROM Boat b
                   WHERE b.color <> 'red'
                   OR EXISTS ( SELECT * FROM Reservation r
                               WHERE r.day = d.day
                               OR EXISTS ( SELECT * FROM Boat b
                                           WHERE r.bname = b.bname )))
```

Sailor	Sname	rating
S		

boat	bname	Color	rating
b	△	○	

res	Sname	bname	day
r		△	□

alldays	day
a	□

ans	day
a	□

Q1) Find days when only red boats are reserved.

Q2) List days when every red boat is reserved.