assignment1

vkvats

2.1. Find the sid and rating of each sailor.

Ans: $\{(s.sid, s.rating)|Sailor(s)\}$

2.2 Find the sid, name, and rating of each sailor whose rating is in the range [2;11] but not in the range [8;10].

Ans: $\{(s.sid, s.name, s.rating)|Sailor(s) \wedge ((s.rating \geq 2 \wedge s.rating < 8) \vee (s.rating > 10 \wedge s.rating \leq 11))\}$

2.3. Find the bid, name, and color of each non-red boat that was reserved by some sailor whose rating is more than 7.

Ans: $\{(b.bid, b.name, b.color)|Boat(b) \wedge (\exists_r \exists_s (Reserves(r) \wedge Sailor(s) \wedge (r.bid = b.bid) \wedge (r.sid = s.sid) \wedge (s.rating > 7) \wedge (b.color \neq Red)))\}$

2.4. Find the bid and name of each boat that was reserved by a sailor on a weekend day but that was not reserved by a sailor on a Tuesday.

Ans: $\{(b.bid, b.name)|Boat(b) \wedge \exists_{r1}(Reserves(r1) \wedge (b.bid = r1.bid) \wedge (r1.day = Saturday \vee r1.day = Sunday)) \wedge \neg \exists_{r2}(Reserves(r2) \wedge (b.bid = r2.bid) \wedge (r2.day = Tuesday))\}$

2.5. Find the sid of each sailor who reserved both a red boat and a green boat.

Ans: $\{(r1.sid)|Reserves(r1) \wedge \exists_{b1} \exists_{r2} \exists_{b2}(Boat(b1) \wedge (b1.bid = r1.bid) \wedge (b1.color = Red) \wedge Reserves(r2) \wedge Boat(b2) \wedge (b2.bid = r2.bid) \wedge (b2.color = Green) \wedge (r1.sid = r2.sid))\}$

2.6. Find the sid and name of each each sailor who reserved at least two different boats.

Ans: $\{(s.sid, s.name)|Sailor(s) \wedge \exists_{r1} \exists_{r2}(Reserves(r1) \wedge (Reserves(r2) \wedge (s.sid = r1.sid) \wedge (s.sid = r2.sid) \wedge (r1.bid \neq r2.bid)))\}$

2.7. Find the pairs of sids (s1; s2) of different sailors who both reserved a same boat.

Ans: $\{(r1.sid, r2.sid)|Reserves(r1) \wedge Reserves(r2) \wedge (r1.bid = r2.bid) \wedge (r1.sid \neq r2.sid)\}$

2.8. Find the sid of each sailor who did not reserve any boats on a Monday or on a Tuesday.

Ans: $\{(s.sid)|Sailor(s) \wedge \neg(\exists_r(Reserves(r) \wedge (s.sid = r.sid) \wedge (r.day = Monday \vee r.day = Tuesday)))\}$

2.9. Find the pairs (s; b) such that the sailor with sid s reserved the boat with bid b, provided that the sailor s has a rating greater than 6 and the color of boat b is not red.

Ans: $\{(s.sid, b.bid) | Sailor(s) \wedge Boat(b) \wedge \exists_r(Reserves(r) \wedge (b.bid = r.bid) \wedge (s.sid = r.sid) \wedge (b.color \neq Red) \wedge (s.rating > 6))\}$

2.10. Find the bid of each boat that where reserved by just one sailor.

Ans: $\{(r1.bid) | Reserves(r1) \wedge \neg\exists_{r2}(Reserves(r2) \wedge (r1.bid = r2.bid) \wedge (r1.sid \neq r2.sid))\}$

2.11. Find the sid of each sailor who reserved fewer than 3 boats.

Ans: $\{(s.sid) | Sailor(s) \wedge \neg(\exists_{r1}\exists_{r1}\exists_{r3}(Reserves(r1) \wedge (Reserves(r2) \wedge (Reserves(r3) \wedge (s.sid = r1.sid) \wedge (s.sid = r2.sid) \wedge (s.sid = r3.sid) \wedge (r1.bid \neq r2.bid) \wedge (r1.bid \neq r3.bid) \wedge (r3.bid \neq r2.bid)))))\}$