Lora Tam
A0984493
CSE 132A
Homework 1

Homework 1

SQL QUERIES

1. List the days when only red boats are reserved
    a. SELECT distinct r.day from reservation r where day not in (select r.day from reservation r, boat b where r.bname = b.bname and b.color < > 'red');
2. List the days when every red boat is reserved
    a. SELECT distinct r.day from reservation r where day not in (select r.day from reservation r, boat b where b.color = 'red' and r.day not in(select day from reservation where bname = b.bname));

TUPLE RELATIONAL CALCULUS

i. write the query in tuple calculus using (at least one) universal quantification ∀
    a. {t : days | ∃ d ∈ alldays [t(day) = d(day) ∧ ∀ r ∈ reservation (d(day) = r(day) → ∃ b ∈ boat (b(bname) = r(bname) ∧ b(color) = red))]}
    b. {t : days | ∃ d ∈ alldays [t(day) = d(day) ∧ ∀ b ∈ boats (b(color) = red → ∃r ∈ reservation(r(day)=d(day) ^ r(bname) = b(bname))))]}

ii. rewrite the query in (i) in using only existential quantification ∃
    a. {t: days| ∃d ∈ alldays [t(day)=d(day) ^ ¬ ∃r ∈ reservation (d(day)=r(day) ^¬ ∃b ∈ boat (b(bname) = r(bname) ^ b(color) = red))]}
    b. {t : days | ∃ d ∈ alldays [t(day) = d(day) ∧ ¬ ∃ b ∈ boats (b(color) = red ∧ ¬ ∃r ∈ reservation(r(day)=d(day) ^ r(bname) = b(bname))))]}

iii. write the SQL query corresponding directly to the tuple calculus query in (ii), that uses NOT EXISTS tests on nested queries
    a. SELECT distinct r.day from reservation r where day not Exists (select r.day from reservation r, boat b where r.bname = b.bname and b.color < > 'red');
    b. SELECT distinct r.day from reservation r where day not Exists (select r.day from reservation r, boat b where b.color = 'red' and r.day not Exists(select day from reservation where bname = b.bname));