

CS3550: DBMS-1

Assignment-1

Relational Algebra

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1. $(\pi_{bid} \sigma_{color='red'} Boats)$ means selecting the boats (only unique tuples, i.e. unique bid's) which are red in color.

Then taking natural join with the set *Reserves* which gives us set of reserved boats.

Then taking natural join with the set *sailors* which gives us the set of sailors(only unique sids) who have made reservation for the remaining red color boats.

Then π_{sname} gives us the name of the above sailors.

Hence, in short we can say the above relational algebra gives us the names of the sailors who have made reservation for red color boats.

2. Tempboats is a relation which has boats which are red and green in color(only unique tuples, i.e. unique bids).

Then taking natural join with the set *Reserves* which gives us the set of reserved boats.

Then taking natural join with the set *sailors* which gives us the set of sailors(only unique sids) who have made reservation for the remaining red and green color boats.

At the end, π_{sname} gives us the name of the sailors satisfying above condition.

Hence, in short, we can say the above relational algebra gives us the names of the sailors who have made reservation for red and green color boats.

3. Temp1 set has sailors who have reserved red color boats.

Temp2 set has sailors who have reserved green color boats.

Then intersection of Temp1 and Temp2 gives us the sids of the sailors who have reserved both red and green color boats.

At the end, π_{sname} gives us the name of the sailors satisfying above condition.

Hence, in short, we can say the above relational algebra gives us the names of the sailors who have made reservation for both red and green color boats.

4. Reservations set have the sailors(with *sid* and *sname*) who have made reservation for boats *bid*.

Reservationpairs has the cross product of Reservations set with Reservation set itself.

At the end we'll find pairs of reservation tuples in which, $sid1=sid2$ means same seller and $bid1!=bid2$ means different boats. So seller who reserved different boats.

Hence, in short, we can say the above relational algebra gives us the names of the sailors who have made reservation for at least two boats.

5. $\Pi_{sid} (\sigma_{age>20} Sailors)$ gives us the set of the sailors/sids whose age is more than 20.

$\Pi_{sid} ((\sigma_{color='red'} Boats) ./ Reserves ./ Sailors)$ gives us the set of sailors/sids who have reserved a red color boat.

At the end we took the difference of first set with the second set which means selecting the sailors whose age is more than 20 and have not made reservation for red color boat.