

## Appendix 1: Basic Operations in SQL

SQL keywords: SELECT, FROM, WHERE, AS, DISTINCT, INTERSECT, UNION, EXCEPT, IN, EXISTS, UNIQUE, ANY, ALL, COUNT, SUM, AVG, MAX, MIN, GROUP BY, HAVING, NULL, CHECK, ASSERTION.

## Appendix 2: Sample Queries

Find names of sailors who have reserved all red boats.

Relational Algebra:

$$\rho(\text{TempSids}, (\pi_{\text{sid}, \text{bid}} \text{Reserves}) / (\pi_{\text{bid}} (\sigma_{\text{colour} = \text{'red'}} \text{Boats})))$$
$$\pi_{\text{sname}}(\text{TempSids} \bowtie \text{Sailors})$$

SQL:

```
SELECT S.sname
FROM Sailors S
WHERE NOT EXISTS
    ((SELECT B.bid
     FROM Boats B
     WHERE B.colour = 'red')
    EXCEPT
    (SELECT R.bid
     FROM Reserves R
     WHERE R.sid=S.sid))
```