CSCI4333 Database Design & Implement

Lecture Sixteen SQL 3

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Inner Join

Sailor

sid	sname	rating	age
22	dustin	7	45.0
31	lubber	8	55.5
58	rusty	10	35.0

R

sid	bid	day
22	101	10/10/96
58	103	11/12/96

What is Result of S⋈ *R* ?

Inner Join

sid	sname	rating	age
22	dustin	7	45.0
31	lubber	8	55.5
58	rusty	10	35.0

sid	bid	day
22	101	10/10/96
58	103	11/12/96

=

sid	sname	rating	age	bid	day
22	dustin	7	45.0	101	10/10/96
58	rusty	10	35.0	103	11/12/96

Inner Join

sid	sname	rating	age
22	dustin	7	45.0
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22	101	10/10/96
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=

sid	sname	rating	age	bid	day
22	dustin	7	45.0	101	10/10/96
58	rusty	10	35.0	103	11/12/96

How can we write it in SQL?

Inner Join

sid	sname	rating	age
22	dustin	7	45.0
31	lubber	8	55.5
58	rusty	10	35.0

sid	bid	day
22	101	10/10/96
58	103	11/12/96

=

sid	sname	rating	age	bid	day
22	dustin	7	45.0	101	10/10/96
58	rusty	10	35.0	103	11/12/96

```
SELECT * FROM S JOIN R ON S.sid=R.sid
SELECT * FROM S INNER JOIN R ON S.sid=R.sid
SELECT * FROM S NATURAL JOIN R
```

Outer Join

- Let R and S be two tables. The outer join preserves the rows of R and S that have no matching rows according to the join condition and outputs them with nulls at the non-applicable columns.
- There exist three different variants: *left outer join*, *right outer join* and *full outer join*.

Outer Join

sid	sname	rating	age
22	dustin	7	45.0
31	lubber	8	55.5
58	rusty	10	35.0

(left outer-join)

sid	bid	day
22	101	10/10/96
58	103	11/12/96

R.sid

41 103

=

sid	sname	rating	age	bid	day
22	dustin	7	45.0	101	10/10/96
31	lubber	8	55.5	Null	Null
58	rusty	10	35.0	103	11/12/96

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SELECT * FROM S LEFT OUTER JOIN R ON S.sid=R.sid

Outer Join

sid	sname	rating	age
22	dustin	7	45.0
31	lubber	8	55.5
58	rusty	10	35.0

(right outer-join)

sid	bid	day
22	101	10/10/96
58	103	11/12/96

=

sid	sname	rating	age	bid	day
22	dustin	7	45.0	101	10/10/96
58	rusty	10	35.0	103	11/12/96

SELECT * FROM S RIGHT OUTER JOIN R ON S.sid=R.sid

Correlated Nested Queries…1

- Thus far, we have seen nested queries where the inner subquery is independent of the outer query.

- We can make the inner subquery **depend** on the outer query. This is called correlation.

Correlated Nested Queries…2

Find names of sailors who have reserved boat 103

```
SELECT  S.sname
FROM  Sailors S
WHERE  EXISTS (SELECT  *
               FROM  Reserves R
               WHERE  R.bid=103 AND R.sid=S.sid);
```

Tests whether the set is nonempty. If it is, then return TRUE.

(For finding sailors who have **not** reserved boat 103, we would use NOT EXISTS)