# Correlated vs. Uncorrelated Subqueries



# Example: IN and EXISTS

Considering the following tables:

Sailors

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

#### Reserves

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

How do the following queries work?

SELECT sname

**FROM Sailors** 

WHERE sid IN (SELECT sid

FROM Reserves )

**SELECT** sname

FROM Sailors S

WHERE EXISTS (SELECT \*

FROM Reserves R

WHERE S.sid = R.sid)



### Uncorrelated Subquery

SELECT sname

**FROM Sailors** 

WHERE sid IN (SELECT sid

FROM Reserves )

### Sailors

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

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



SELECT sname
FROM Sailors
WHERE sid IN (SELECT sid
FROM Reserves)

Resei		ves	
<u>sid</u>	1	<u>id</u>	<u>day</u>
22	-	01	10/10/96
58	-	03	11/12/96



SELECT sname

FROM Sailors

WHERE sid IN (SELECT sid

FROM Reserves)

### Sailors

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

sid	1	id	<u>day</u>
22	ν 1	01	10/10/96
58	۸ ۱	03	11/12/96



SELECT sname

FROM Sailors

WHERE sid IN (SELECT sid

FROM Reserves)

### Sailors

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

<u>sid</u>	1	id	day
22	Λ 1	01	10/10/96
58	1 1	03	11/12/96



SELECT sname

FROM Sailors

WHERE sid IN (SELECT sid

FROM Reserves)

### Sailors

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

D	~
Rese	ves

sid	1	id	day
22	1 1	01	10/10/96
58	Υ 1	03	11/12/96



SELECT sname

**FROM Sailors** 

WHERE sid IN (SELECT sid

FROM Reserves)

Sai	ors	1	
sid	sname	rating	age
22	dustin	7	45.0
31	lubber	8	55.5
58	rusty	10	35.0

Answer!

Reserv	ves
--------	-----

sid	1	id	day
22	1	01	10/10/96
58	1	03	11/12/96



SELECT sname

FROM Sailors

WHERE sid IN (SELECT sid

FROM Reserves)

Sai	ors	1	
sid	sname	ating	age
22	dustin	7	45.0
31	lubber	8	55.5
58	rusty	10	35.0

Answer!

Rese		ves		
	<u>sid</u>	1	id	day
	22	ν 1	01	10/10/96
	58	X 1	03	11/12/96

This subquery was computed ONCE!



# Correlated Subquery

SELECT sname

FROM Sailors S

WHERE EXISTS (SELECT \*

FROM Reserves R

WHERE S.sid = R.sid)

### Sailors

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



SELECT sname

FROM Sailors S

WHERE EXISTS (SELECT \*

FROM Reserves R

WHERE S.sid = R.sid)

### Sailors

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	



SELECT sname

FROM Sailors S

WHERE EXISTS (SELECT \*

FROM Reserves R

WHERE S.sid = R.sid)

### Sailors

sid	sname	rating	age	
22	dustin	7	45.0	
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58	rusty	10	35.0	

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



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FROM Sailors S

WHERE EXISTS (SELECT \*

FROM Reserves R

WHERE S.sid = R.sid)

### Sailors

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

<u>sid</u>	<u>bid</u>	<u>day</u>
22	101	10/10/96
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SELECT sname

FROM Sailors S

WHERE EXISTS (SELECT \*

FROM Reserves R

WHERE S.sid = R.sid)

Sailors

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

**Answer!** 

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



SELECT sname

FROM Sailors S

WHERE EXISTS (SELECT \*

FROM Reserves R

WHERE S.sid = R.sid)

Sailors

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

Answer!

### Reserves

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

This was <u>used and recomputed for each row</u> of the outer query!



# Query Without Nesting

The same query using join

SELECT sname FROM Sailors S, Reserves R WHERE S.sid = R.sid

- More efficient solution and in this case simpler!
- Avoid nesting as much as possible

