

CS122 Using Relational Databases and SQL Joins

Chengyu Sun
California State University, Los Angeles

Combine Information from Different Tables

- ◆ Find the shipping address of Order #2

orders

id	customer_id	date_ordered	date_shipped
1	1	5/29/2007	6/5/2007
2	2	6/1/2007	null

customers

id	first_name	last_name	address
1	John	Doe	123 Main Street
2	Jane	Doe	123 Main Street
3	Tom	Smith	456 State Street

Put Two Tables Together – The Cartesian Product

- ◆ a.k.a. Cross Join

A	B	C	D
a ₁	b ₁	c ₁	d ₁
a ₂	b ₂	c ₂	d ₂
a ₂	b ₂	c ₃	d ₃

```
select * from orders, customers;
select * from orders cross join customers;
```

An Equi-Join Query

```
select orders.id, c.address
  from orders, customers c
 where orders.customer_id = c.id
    and orders.id = 2;
```

Table alias

Inner Join

```
select orders.id, c.address
  from orders inner join customers c
 on orders.customer_id = c.id
 and orders.id = 2;
```

Some Join Examples

- ◆ List the names of the customers who made orders on June 1, 2007
- ◆ List the descriptions of all the products ordered on June 1, 2007
- ◆ List the descriptions of the products ordered by John Doe on June 1, 2007

The Unmatched Rows ...

- ◆ List the names of the customers and the id's of their orders

```
select c.first_name, c.last_name, o.id
from customers c inner join orders o
on c.id = o.customer_id;
```



first_name	last_name	id
John	Doe	1
Jane	Doe	2

... The Unmatched Rows

- ◆ What if we want the following results:

first_name	last_name	id
John	Doe	1
Jane	Doe	2
Tom	Smith	null

Outer Joins

- ◆ Include the results of an Inner Join and the unmatched rows from *one or both* join tables

table1

A	B
1	10
2	12

table2

C	D
1	23
3	32
4	34

Left Outer Join

- ◆ a.k.a. Left Join

table1 *left outer join* table2 on A=C

A	B	C	D
1	10	1	23
2	12	null	null

Right Outer Join

- ◆ a.k.a. Right Join

table1 *right outer join* table2 on A=C

A	B	C	D
1	10	1	23
null	null	3	32
null	null	4	34

Full Outer Join

- ◆ a.k.a. Full Join
- ◆ MySQL does not support full outer join

table1 *full outer join* table2 on A=C

A	B	C	D
1	10	1	23
2	12	null	null
null	null	3	32
null	null	4	34

Self Join

- ◆ Find the pairs of customers who live together