CGS 2545: Database Concepts
Spring 2012

SQL In-class Exercises – Part 2

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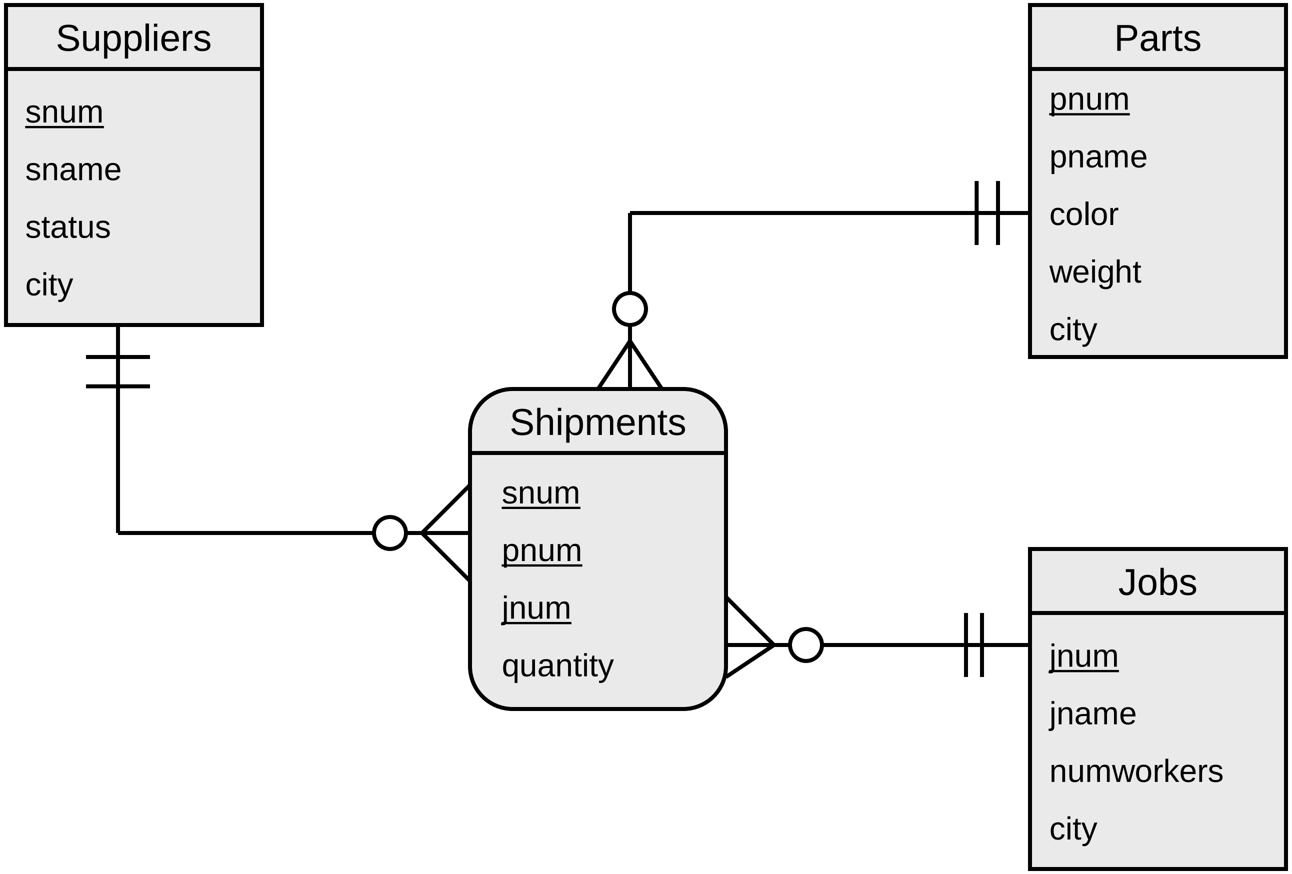
SQL In Class Exercises

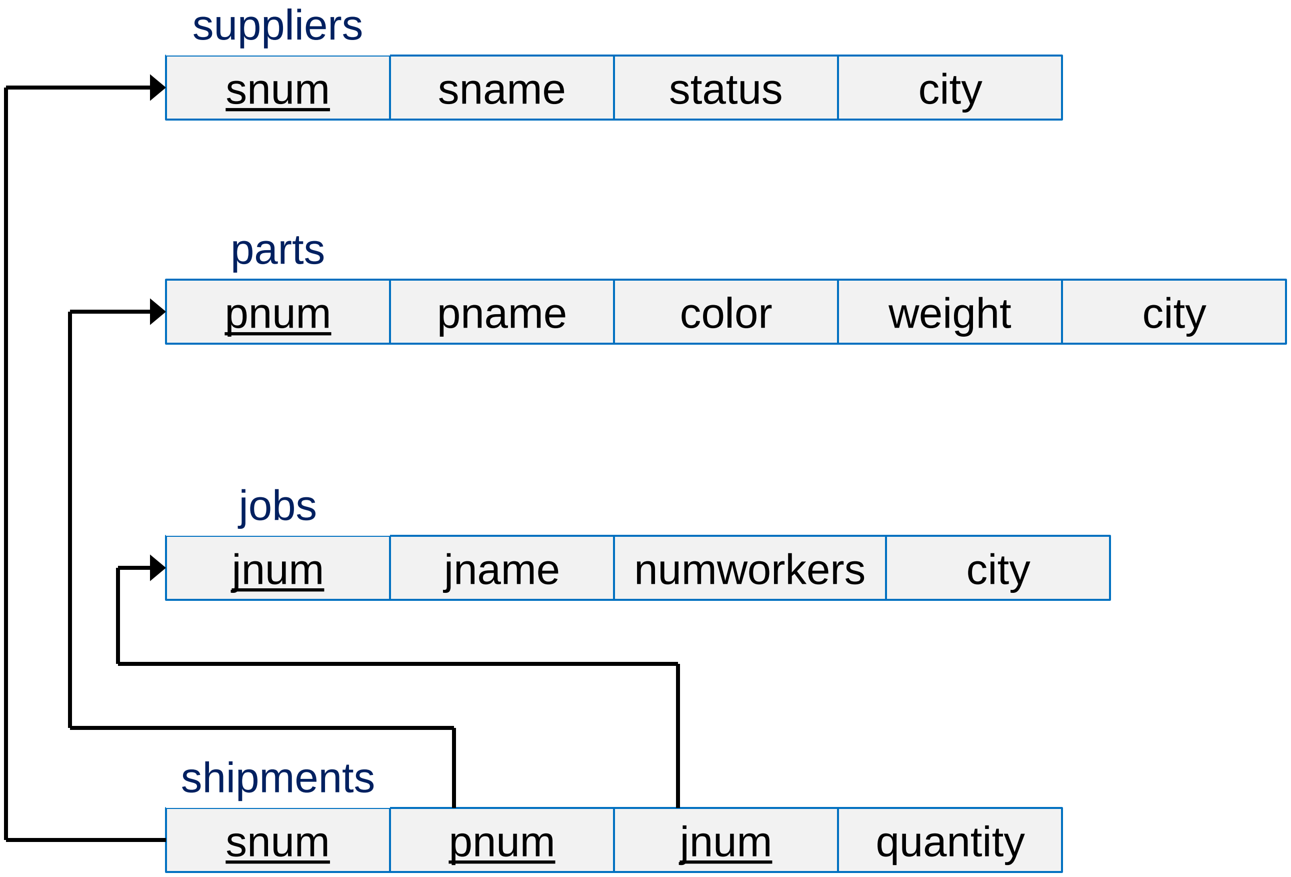
- Use the following database scheme for problems 1-9 in this exercise.



- Develop SQL expressions for each of the following queries:

SQL In Class Exercises

- The schema version of the database for problems 1-9.



suppliers

snum	sname	status	city

parts

pnum	pname	color	weight	city

jobs

jnum	jname	numworkers	city

shipments

snum	pnum	jnum	quantity

1. List only the names of those suppliers who ship a part that weighs more than 200.

Solutions

```
SELECT sname
FROM suppliers NATURAL JOIN shipments CROSS JOIN parts
WHERE weight > 200 AND shipments.pnum = parts.pnum;
```

Note that a second natural join won’t work here since the join would also occur on the city attribute, which would be a more restrictive query.

- or -

```
SELECT sname
FROM suppliers
WHERE snum IN (SELECT snum
               FROM shipments
               WHERE pnum IN (SELECT pnum
                              FROM parts
                              WHERE weight > 200) ) );
```

2. List the names of those cities in which both a supplier and a job are located.

Solutions

```
    SELECT supplier.city
    FROM suppliers NATURAL JOIN jobs;
```

- or -

```
   SELECT supplier.city
   FROM suppliers
   WHERE city IN (SELECT city
                  FROM jobs);
```

3. List the names of those jobs that receive a shipment from supplier number S1.

Solutions

```
SELECT jname
FROM jobs
WHERE jnum IN (SELECT jnum
               FROM shipments
               WHERE snum = “S1”);
```

- or -

```
SELECT jname
FROM jobs NATURAL JOIN shipments
WHERE snum = “S1”;
```

4. List the names of those parts that are not shipped to any job.

Solutions

```
SELECT pname
FROM parts
WHERE pnum NOT IN (SELECT pnum
                   FROM shipments);
```

- or -

```
SELECT pname
FROM parts
WHERE NOT EXISTS (SELECT *
                  FROM shipments
                  WHERE shipments.pnum = parts.pnum);
```

5. List the names of those suppliers who ship part number P2 to any job.

<u>Solutions</u>

```
SELECT sname
FROM suppliers
WHERE snum IN (SELECT snum
               FROM shipments
                WHERE pnum = “P2”);
```

- or -

```
SELECT sname
FROM suppliers NATURAL JOIN shipments
WHERE pnum = “P2”;
```

6. List the names of those suppliers who do not ship part number P2 to any job.

Solutions

```
SELECT sname
FROM suppliers
WHERE snum NOT IN (SELECT snum
                   FROM shipments
                   WHERE pnum = “P2”);
```

- or -

```
SELECT sname
FROM suppliers
WHERE NOT EXISTS (SELECT *
                  FROM shipments
                  WHERE shipments.snum = suppliers.snum AND shipments.pnum = “P2”);
```

Note that neither of the following are correct!

```
SELECT sname
FROM suppliers
WHERE snum = (SELECT snum
    FROM shipments
    WHERE pnum ≠ “P2”);
```

-or-

```
SELECT sname
FROM suppliers
WHERE snum IN (SELECT snum
   FROM shipments
   WHERE snum ≠ “P2”);
```

7. List the names of those suppliers who ship part at least one red part to any job.

Solutions

```
SELECT sname
FROM suppliers
WHERE snum IN (SELECT snum
               FROM shipments
                WHERE pnum IN (SELECT pnum
                               FROM parts
                               WHERE color = “red” ));
```

- or -

```
 SELECT sname
 FROM suppliers NATURAL JOIN shipments
 WHERE pnum IN (SELECT pnum
                FROM parts
                WHERE color = “red”);
```

8. List the part number for every part that is shipped by more than one supplier.

Solution

```
SELECT pnum
FROM shipments
GROUP BY pnum
HAVING COUNT (snum) > 1;
```

WHERE clause restricts by rows

HAVING clause restricts by groups

9. List the names of those suppliers who ship every part.

Solutions

```
SELECT sname
FROM suppliers
WHERE  NOT EXISTS (SELECT *
                   FROM parts
                   WHERE NOT EXITS (SELECT *
                                    FROM shipments
                                    WHERE shipments.snum = suppliers.snum
                                      AND shipments.pnum = parts.pnum ) );
```

This solution is correct if the participation of parts in shipments is optional or mandatory.

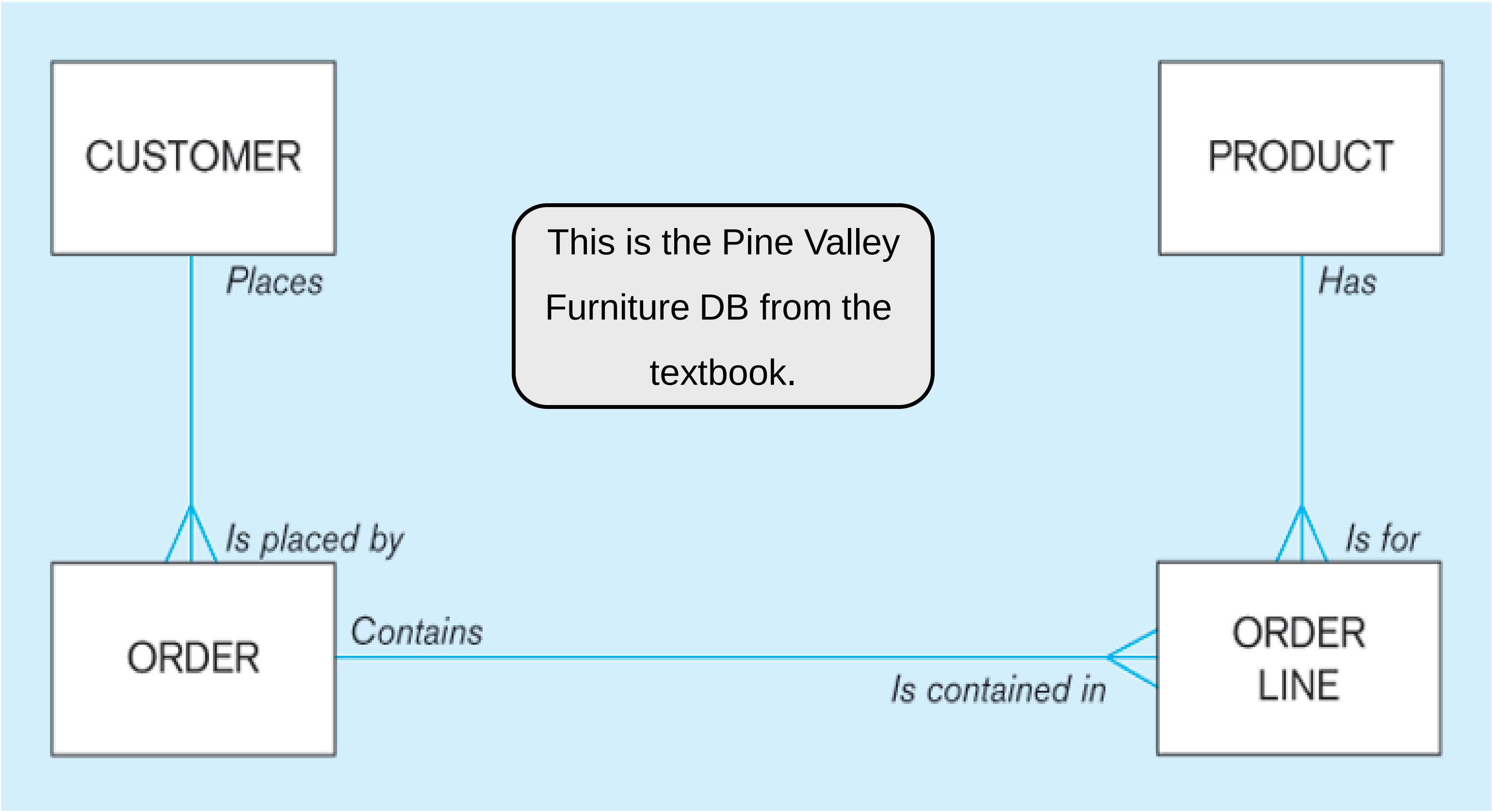
- or -

```
SELECT sname
FROM suppliers
WHERE (SELECT COUNT (shipments.pnum)
        FROM shipments
        WHERE shipments.snum = suppliers.snum)
     =
      (SELECT COUNT (parts.pnum)
                        FROM parts);
```

This solution is correct only if the participation of parts in shipments is mandatory. It is incorrect if the participation of parts in shipments is optional.

SQL In Class Exercises

- Use the following database scheme for problems 10- in this exercise.

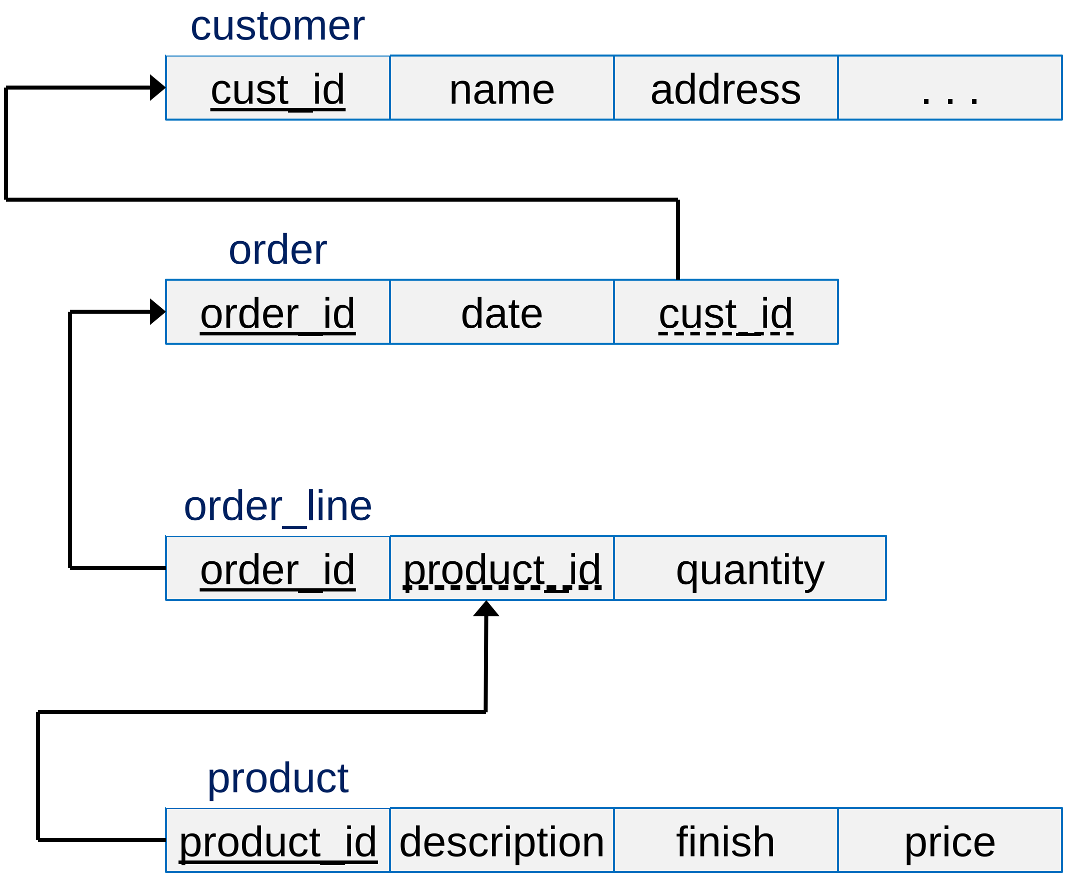


This is the Pine Valley Furniture DB from the textbook.

- Develop SQL expressions for each of the following queries:

SQL In Class Exercises

- The schema version of the database.



customer

cust_id	name	address	. . .

order

order_id	date	cust_id

order_line

order_id	product_id	quantity

product

product_id	description	finish	price

10. List the date of every order placed by customer 5.

Solutions

```
SELECT date
FROM order
WHERE cust_id = 5;
```

- or -

```
SELECT DISTINCT date
FROM order
WHERE cust_id = 5;
```

11. List all the cities from which a customer placed an order on March 29th.

Solutions

```
SELECT DISTINCT city
FROM customer NATURAL JOIN order
WHERE date = “March 29”;
```

- or -

```
SELECT DISTINCT city
FROM customer
WHERE cust_id  IN (SELECT cust_id
                   FROM order
                   WHERE date = “March 29”);
```

12. List the dates for every order placed that included part number 6.

Solutions

```
    SELECT DISTINCT date
    FROM order NATURAL JOIN order_line
    WHERE product_id = 6;
```

- or -

```
   SELECT DISTINCT date
   FROM order
   WHERE order_id  IN (SELECT order_id
                       FROM order_line
                       WHERE product_id = 6);
```

13. List the names of those customers who have not placed any orders.

Solution

```
SELECT name
FROM customer
WHERE cust_id NOT IN (SELECT cust_id
                      FROM order);
```

14. List the names of those customers who have never ordered part number 6.

Solution

```
SELECT DISTINCT name
FROM customer
WHERE cust_id NOT IN (SELECT cust_id
                    FROM order
                    WHERE order_id IN (SELECT order_id
                                     FROM order_line
                                     WHERE product_id = 6)
                     );
```

15. List the names of those customers who have ordered both part number 5 and part number 6.

Solution

```
SELECT DISTINCT name
FROM customer
WHERE  (cust_id IN (SELECT cust_id
                FROM order
                 WHERE order_id IN (SELECT order_id
                                  FROM order_line
                                  WHERE product_id = 5)  )
        )
        AND
       (cust_id IN (SELECT cust_id
                FROM order
                 WHERE order_id IN (SELECT order_id
                                  FROM order_line
                                  WHERE product_id = 6)  )
        );
```

16. List the names of those customers who have ordered part number 5 and not ordered part number 6.

Solution

```
SELECT DISTINCT name
FROM customer
WHERE  (cust_id IN (SELECT cust_id
                    FROM order
                     WHERE order_id IN (SELECT order_id
                                        FROM order_line
                                        WHERE product_id = 5)  )
        )
        AND
       (cust_id  NOT IN (SELECT cust_id
                    FROM order
                     WHERE order_id IN (SELECT order_id
                                         FROM order_line
                                          WHERE product_id = 6)  )
        );
```

17. List the names of those customers who have ordered either part number 5 or part number 6.

Solution

```
SELECT DISTINCT name
FROM customer
WHERE  cust_id IN (SELECT cust_id
                FROM order
                 WHERE order_id IN (SELECT order_id
                                  FROM order_line
                                   WHERE product_id = 5
                                     OR product_id = 6)  );
```

18. List the names of those customers who have ordered only part number 6.

Solution

```
SELECT DISTINCT name
FROM customer
WHERE  (cust_id IN (SELECT cust_id
                  FROM order
                   WHERE order_id IN (SELECT order_id
                                      FROM order_line
                                      WHERE product_id = 6)  )
        )
        AND
       (cust_id  NOT IN (SELECT cust_id
                  FROM order
                   WHERE order_id IN (SELECT order_id
                                       FROM order_line
                                        WHERE product_id <> 6)  )
        );
```