练习二

查询操作

1. 在零件表的视图中找出weight < 20 的零件名字(PNAME)

```
spj=# select DISTINCT PNAME
spj-# from P
spj-# where weight<20;
   pname
-----------
 螺母
 螺栓
 螺丝刀
(4 行记录)
```

1. 查询供应商表中城市为北京的供应商姓名(SNAME)

```
spj=# select SNAME
spj-# from s
spj-# where city='北京';
   sname
-----------
 东方红
 盛锡
(2 行记录)
```

1. 在零件表中查询平均重量在15以上的零件名字和零件代码（PNO）

```
spj=# select PNAME, PNO
spj-# from P
spj-# GROUP BY PNO
spj-# HAVING AVG(ALL WEIGHT) > 15;
  pname   | pno
----------+-----
 凸轮     | P5
 螺栓     | P2
 齿轮     | P6
```

1. 查询全体供应商的姓名（SNAME）和状态(STATUS)

```
spj=# select SNAME, status
spj-# from s;
   sname   | status
-----------+--------
 精益      | 20
 东方红    | 30
 丰泰盛    | 20
 为民      | 30
 盛锡      | 10
(5 行记录)
```

1. 查询所有weight在13到20（含13和20）的零件代码（PNO）、零件名（PNAME）和颜色(COLOR)

```
spj=# SELECT PNO, PNAME, COLOR
spj-# FROM P
spj-# WHERE WEIGHT >= 13 AND WEIGHT <= 20;
 pno |   pname   | color
-----+-----------+-------
 P2  | 螺栓      | 绿
 P3  | 螺丝刀    | 蓝
 P4  | 螺丝刀    | 红
(3 行记录)
```

1. 查询所有“螺”开头的的零件代码（PNO）和零件名（PNAME）

```
spj=# SELECT PNO, PNAME
spj-# FROM P
spj-# WHERE PNAME LIKE '%螺%';
 pno |   pname
-----+-----------
 P1  | 螺母
 P2  | 螺栓
 P3  | 螺丝刀
 P4  | 螺丝刀
(4 行记录)
```

1. 查询所有零件的平均重量

```
spj=# SELECT AVG(WEIGHT)
spj-# FROM P;
         avg
---------------------
 21.1666666666666667
(1 行记录)
```

1. 查询同在“天津”的工程项目名（JNAME）

```
spj=# SELECT JNAME
spj-# FROM J
spj-# WHERE CITY='天津'
spj-# ORDER BY JNAME;
    jname
-------------
 弹簧厂
 造船厂
(2 行记录)
```

1. 查询在“精益”供应商下的零件，且质量小于15的零件详细信息

```
spj=# SELECT DISTINCT P.PNO, P.PNAME, P.COLOR, P.WEIGHT
spj-# FROM S, P, SPJ
spj-# WHERE S.SNAME='精益' AND S.SNO=SPJ.SNO AND P.PNO=SPJ.PNO AND P.WEIGHT < 15;
 pno |  pname   | color | weight
-----+----------+-------+--------
 P1  | 螺母     | 红    |     12
(1 行记录)
```

练习三：

复杂子查询操作：

1）在零件表中找出weight排名前三的零件名字(PNAME)，按降序输出

```
spj=# select PNAME
spj-# from p
spj-# order by weight DESC LIMIT 3;
  pname
----------
 凸轮
 齿轮
 螺栓
(3 行记录)
```

2）查询工程项目中至少使用了供应商S1所供应的全部零件的城市(CITY)

```
1. 连接谓词和选择谓词：
select DISTINCT CITY
from j, spj
where j.JNO=spj.JNO and spj.SNO='S1';

2. join on
select DISTINCT CITY
from
(j join spj
on (j.JNO=spj.JNO))
where spj.SNO='S1';

3. 带有 IN 谓词的子查询
select DISTINCT CITY
from J
where JNO
IN
(select JNO
from SPJ
where SNO='S1');


  city
--------
 北京
 天津
 长春
(3 行记录)
```

3）查询出供应商代码（SNO）为S1的，生产零件的全部颜色（COLOR）

```
1. 连接谓词和选择谓词：
select DISTINCT color
from p, spj
where p.PNO=spj.PNO and spj.SNO='S1';

2. join on
select DISTINCT color
from
(p join spj
on (p.PNO=spj.PNO)
and spj.SNO='S1');

3. 带有 IN 谓词的子查询
select DISTINCT color
from P
where PNO
IN
(select PNO
from SPJ
where SNO='S1');
```

4）查询所有WEIGHT > 20的零件名字(PNAME),零件代码(PNO),供应商代码(SNO)，供应商姓名(SNAME)

```
1. 连接谓词和选择谓词：
select p.PNAME, p.PNO, s.SNO, s.SNAME
from p, s, spj
where s.SNO=spj.SNO and spj.PNO=p.PNO and p.weight>20 group by (s.SNO, p.PNO);

2. join on
select p.PNAME, p.PNO, s.SNO, s.SNAME
from
(p join spj on p.PNO=spj.PNO)
join s on (spj.SNO=s.SNO)
where p.weight>20
group by (p.PNO, s.SNO);

3. 带有 IN 谓词的子查询
select p.PNAME, p.PNO, s.SNO, s.SNAME
from p, s
where (PNO IN (select PNO from spj where p.PNO=spj.PNO and SNO IN (select SNO
from spj where spj.SNO=s.SNO)))
and p.weight>20 group by (s.SNO, p.PNO);

  pname   | pno | sno |   sname
----------+-----+-----+-----------
 齿轮     | P6  | S5  | 为民
 凸轮     | P5  | S4  | 丰泰盛
 齿轮     | P6  | S4  | 丰泰盛
 凸轮     | P5  | S2  | 盛锡
(4 行记录)
```

5）查询供应工程J1零件为红色的供应商号码(SNO)

```
1. 连接谓词和选择谓词：
select s.SNO, p.PNO
from s, p, spj
where spj.JNO='J1' and s.SNO=spj.SNO and spj.PNO=p.PNO and p.color='红';

2. join on
select s.SNO, p.PNO
from
(p join spj on spj.PNO=p.PNO
join s on s.SNO=spj.SNO)
where p.color='红' and spj.JNO='J1';

3. 带有 IN 谓词的子查询
select s.SNO, p.PNO
from s, p
where
(PNO IN (select PNO from spj where p.PNO=spj.PNO and SNO IN (select SNO from spj
where spj.SNO=s.SNO)  and spj.JNO='J1'))
and p.color='红';


 sno | pno
-----+-----
 S1  | P1
 S3  | P1
(2 行记录)
```

练习四

练习带分组聚集的查询

1）查询大于平均WEIGHT的零件，列出他们的供应商代码（SNO），零件代码（PNO），工程代码（JNO），供应数量（QTY）

```
select SNO, PNO, JNO, QTY
from spj
where PNO in (
select PNO from p where weight > (select AVG(weight) from p)
);
```

2）查询小于平均供应数量QTY的(零件及工程组合)，列出他们的零件代码（PNO）、工程代码(JNO)、数量（QTY）、零件名（PNAME），颜色（COLOR）

```
select distinct spj.PNO, JNO, QTY, pname, color
from p, spj
where p.pno=spj.pno and QTY < (select AVG(QTY) from spj)
ORDER BY spj.PNO;
```

3）查询供应数量QTY不在99-301之间的(零件及工程组合)，列出他们的工程代码（JNO）、零件代码（PNO），零件名（PNAME），颜色（COLOR）

```
select distinct jno, spj.pno, pname, color
from p, spj
where p.pno=spj.pno and(jno, spj.pno) in(
select jno, pno
from spj
```

```
where QTY<99 or QTY>300
GROUP BY (jno, pno)
);

 jno | pno |   pname    | color
-----+-----+------------+-------
 J1  | P3  | 螺丝刀     | 蓝
 J1  | P5  | 凸轮       | 蓝
 J4  | P1  | 螺母       | 红
 J4  | P3  | 螺丝刀     | 蓝
 J4  | P6  | 齿轮       | 红
 J5  | P3  | 螺丝刀     | 蓝
(6 行记录)
```

4）查询WEIGHT大于15，且平均供应数量QTY必须在250以上的零件，列出他们的零件代码（PNO），零件名（PNAME）,供应数量（QTY）

```
select distinct p.PNO, PNAME, QTY from p, spj where p.PNO=spj.PNO and weight >
15 and p.PNO in ( select PNO from spj GROUP BY PNO HAVING AVG(QTY)>250);
GROUP BY (p.PNO, PNAME, QTY);

 pno |  pname    | qty
-----+-----------+-----
 P6  | 齿轮      | 300
 P6  | 齿轮      | 200
 P6  | 齿轮      | 500
(行记录)
```

5）查询工程项目代码（JNO）为“J1”的项目，列出所有使用的零件代码（PNO），零件名（PNAME），颜色（COLOR）

```
select p.PNO, p.pname, p.color
from p, spj
where JNO='J1' and p.PNO=spj.PNO
GROUP BY p.PNO;

SELECT DISTINCT P.PNO,PNAME,COLOR FROM P,SPJ WHERE SPJ.PNO=P.PNO AND
SPJ.JNO='J1';

 pno |   pname    | color
-----+------------+-------
 P1  | 螺母       | 红
 P3  | 螺丝刀     | 蓝
 P5  | 凸轮       | 蓝
(3 行记录)
```

6）查询供应商代码（SNO），零件代码（PNO），重量（WEIGHT），通过零件代码（PNO），重量（WEIGHT）排序

```
select distinct spj.SNO, (spj.PNO, p.weight)
from p, spj
where spj.pno=p.PNO
ORDER BY (spj.PNO, p.weight);

 sno |   row
```

```
-----+---------
 S1  | (P1,12)
 S3  | (P1,12)
 S1  | (P2,17)
 S5  | (P2,17)
 S2  | (P3,14)
 S3  | (P3,14)
 S5  | (P3,14)
 S2  | (P5,40)
 S4  | (P5,40)
 S4  | (P6,30)
 S5  | (P6,30)
(11 行记录)
```