实验题目	关系数据库管理系统与 SQL			实验日期	2022/04/03
班级	1903501	学号	1190202425	姓名	傅彦璋

CS33503 数据库系统实验

实验检查记录

实验结果的正确性(60%)		表达能力(10%)	
实验过程的规范性(10%)		实验报告(20%)	
加分(5%)		总成绩(100%)	

实验报告

一、实验目的

1. 掌握 PostgreSQL 的使用方法;
2. 利用 SQL 创建、修改、查询和控制关系数据库。

二、实验环境

PostgreSQL 13.4 on x86_64-apple-darwin20.4.0, compiled by Apple clang version 12.0.5 (clang-1205.0.22.9), 64-bit

三、实验过程

3.1 练习使用 psql 命令

我在连接数据库 Product 后，试图创建另一个数据库 College。似乎没什么优雅的方法，需要\q 退出 psql，然后重新连接到某个用户之后再 create database。

3.2 验证第 3 章例子

验证发现，除了嵌套查询的例子中用了不存在的属性 Cname，似乎没什么问题

3.3 习题 11

(a)

```
select distinct maker from Product where type='laptop' except select distinct maker from Product where type='pc';
```

(b)

```
select distinct maker from Product where maker not in (select maker from Product where type='pc') and maker in (select maker from Product where type='laptop');
```

(c)

```
select distinct maker from Product as A where type='laptop' and not exists (select * from Product as B where B.maker = A.maker and B.type='pc');
```

(d)

```
select P1.model from Printer as P1 join Printer as P2 on (P1.price < P2.price) where P2.model=3002;
```

(e)
select model from Printer as P1 where P1.price < (select price from Printer as P2 where P2.model=3002);

(f)
select model from Printer as P1 where exists (select price from Printer as P2 where P2.model=3002 and P2.price>P1.price);

(g)
select PC1.model from PC as PC1 left outer join PC as PC2 on (PC1.speed < PC2.speed) where PC2.model is null;

(h)
select model from PC where speed in (select max(speed) from PC);

(i)
select model from PC where speed = (select max(speed) from PC);

(j)
select model from PC where speed >= (select max(speed) from PC);

(k)
select model from PC as PC1 where not exists (select * from PC as PC2 where PC2.speed > PC1.speed);

(l)
select distinct A.maker from ((Product join PC using(model)) as A join (Product join PC using(model)) as B on A.speed != B.speed and A.maker = B.maker) join (Product join PC using(model)) as C on A.speed != C.speed and B.speed != C.speed and A.maker = C.maker;

(m)
select maker from Product join PC using(model) group by maker having count(distinct speed)>=3 ;

(n)
select maker from (select maker, count(distinct speed) as cnt from Product join PC using(model) group by maker) as A where A.cnt >=3;

(o)
update PC set price = price*0.90 where model = any (select model from Product where maker = 'A');

(p)
update PC set price = price*0.90 where model in (select model from Product where maker = 'A');

(q)
update PC set price = price*0.90 where exists(select * from Product where maker = 'A' and model = PC.model);

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四、实验结论

PostgreSQL 真好，mySQL 不支持集合相减操作，不如 PostgreSQL 舒服。