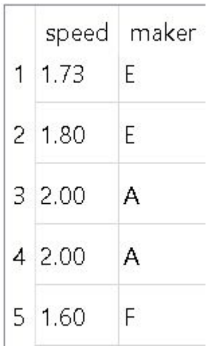
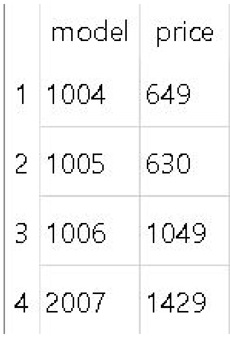
```
a)  select speed, maker
    from Laptop
    natural join
    Product
    where hd>30
```



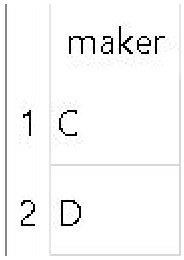
	speed	maker
1	1.73	E
2	1.80	E
3	2.00	A
4	2.00	A
5	1.60	F

```
b)  select model ,price
from Product
natural join printer
where maker = "B"
union
select model,price
from Product
natural join pc
where maker = "B"
union
select model,price
from Product
natural join laptop
where maker = "B"
```



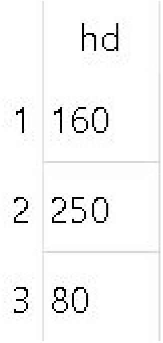
	model	price
1	1004	649
2	1005	630
3	1006	1049
4	2007	1429

```
c)select maker
from Product
where Product.type ="pc"
except
select maker
from Product
where Product.type ="laptop"
```



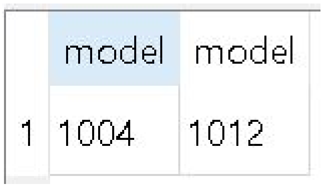
	maker
1	C
2	D

```
d) SELECT hd
   FROM pc
   GROUP BY hd
   HAVING COUNT(*) >= 2
```



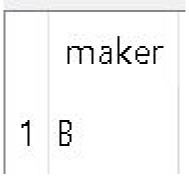
	hd
1	160
2	250
3	80

```
e) select a.model,b.model
   from pc a, pc b
   where a.model<b.model and a.speed = b.speed and a.ram = b.ram
```



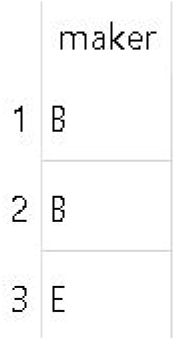
	model	model
1	1004	1012

```
f) select maker
from(select model,speed from pc union
select model,speed from Laptop)as r1
natural join Product
where speed > 3.0
group by maker
having count(*) >= 2
```



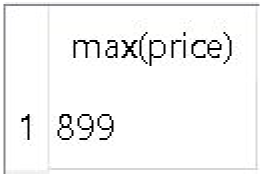
	maker
1	B

```
g)select maker
  from pc
  natural join Product
  where speed >=3
```



	maker
1	B
2	B
3	E

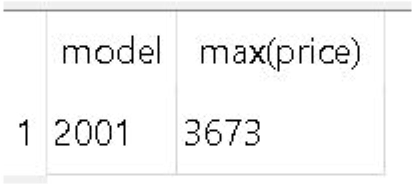
```
h) SELECT max(price)
FROM Printer
```



	max(price)
1	899

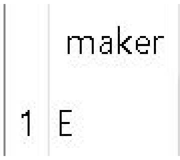
```
i) select *
 from Laptop,pc
 where Laptop.speed < (SELECT min(speed) FROM pc)
j) select model,max(price)
 from
 (
 SELECT model, price FROM pc WHERE price = (SELECT MAX(price) FROM pc)
```

```
  UNION
  SELECT model, price FROM Laptop WHERE price = (SELECT MAX(price) FROM Laptop)
  UNION
  SELECT model, price FROM Printer WHERE price = (SELECT MAX(price) FROM printer)) AS
t1
```



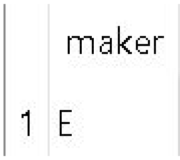
	model	max(price)
1	2001	3673

```
k) select maker
from(select min(price),model
from Printer
where color = "true")AS t1
natural join Product
```



	maker
1	E

```
l) select maker
from
(select model,max(speed),min(ram)
from pc)AS t1
natural join product
```



	maker
1	E

m)

3. (5 points) A general form of relational-algebra query is: πL(σC(R1 ×R2 ×...×Rn))
Here, L is an arbitrary list of attributes, and C is an arbitrary condition. The list of relations R1,R2,...,Rn may include the same relation repeated several times, in which case appropriate renaming may be assumed applied to the R0 is. Show how to express any query of this form in SQL.

ANSWER

To fix this issue ou should create a tuple variable for each R_i such that i Є [1,2,....,n] and this will be used for the FROM clause of the SQL statement (for example FROM R_1 AS T1 , FROM R_2 AS T2, etc)

And then the SELECT from the list of conditions L by T_i.L_i

And then replace the condition C that has an attribute relative to the relation (for example where T_i.Attribute > or < or = … etc)