



Bilkent University
Department of Computer Engineering

CS - 353 Database Systems

Homework 3
Writing SQL Query

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Section: 3

Question 1

a)

```
select model,price from Printer  
where color = "yes" and type = "laser"
```

b)

```
( select distinct maker from Product where type="PC" or  
type="Laptop" ) except  
( select distinct maker from Product where type="printer" )
```

c)

```
select maker,model,price  
from Product natural join Laptop  
where hd > 120 and ram >= 1024 and screen >= 17.0
```

d)

```
select distinct product1.maker, product2.maker  
from (Product natural join PC) as product1, (Product natural join PC)  
as product2  
where product1.speed>= 2.5 and product2.speed >= 2.5 and  
product1.model = product2.model
```

e) i)

```
select first.model  
from Product as first, Product as second, Product as third  
where first.type = "Laptop" and first.model = second.model and  
first.model = third.model and first.maker < second.maker and  
first.maker < third.maker and second.maker < third.maker
```

ii)

```
with maker_over_3 (model, type,count) (  
    select model, type, count(maker) as count  
    from Product  
    group by model having count(maker) >= 3)  
select model from maker_over_3 where type="Laptop"
```

f)

```
with PC_Product(maker) as  
    (select distinct maker  
    from Product natural join PC  
    where speed >= 2.50),  
Laptop_Product (maker) as  
    (select distinct maker  
    from Product natural join Laptop  
    where speed >= 2.50)  
all_manufacturers (maker) as  
    (select maker  
    from PC_Product) union  
    (select maker  
    from Laptop_Product)  
select distinct maker  
from all_manufacturers
```

g) i)

with one_PC (maker) as

```
( select distinct maker from Product where type="PC" except  
  (select distinct product1.maker as maker  
  from Product as product1, Product as product2  
  where product1.type="PC" and product2.type = "PC" and  
    product1.maker = product2.maker and product1.model  
    < product2.model) ),
```

one_Laptop (maker) as

```
(select distinct maker from Product where type="Laptop" except  
  (select distinct product1.maker as maker  
  from Product as product1, Product as product2  
  where product1.type="Laptop" and product2.type = "Laptop"  
    and product1.maker = product2.maker and  
    product1.model < product2.model) ),
```

one_Printer (maker) as

```
(select distinct maker from Product where type="Printer" except  
  (select distinct product1.maker as maker  
  from Product as product1, Product as product2  
  where product1.type="Printer" and product2.type = "Printer"  
    and product1.maker = product2.maker and  
    product1.model < product2.model) ),
```

select one_PC.maker

from one_PC, one_Laptop, one_Printer

where one_PC.maker = one_Laptop **and** one_PC.maker = one_Printer

ii)

with one_PC (maker) **as** (**select** maker

from Product **natural join** PC

group by maker **having** count(model) = 1)

one_Laptop (maker) **as** (**select** maker

from Product **natural join** Laptop

group by maker **having** count(model) = 1)

one_Printer (maker) **as** (**select** maker

from Product **natural join** Printer

group by maker **having** count(model) = 1)

select one_PC.maker

from one_PC, one_Laptop, one_Printer

where one_PC.maker = one_Laptop **and** one_PC.maker = one_Printer

h) i)

with lower_speed(model) **as**

(**select** laptop1.model

from Laptop **as** laptop1, Laptop **as** laptop2

where laptop1.speed < laptop2.speed),

Laptop_model (model) **as**

(**select** model **from** Laptop

except (**select** model **from** lower_speed))

select maker
from Laptop_model **natural join** Product

ii)

select maker
from Product **natural join** Laptop
where speed = **max**(speed)

i)

select distinct laptop1.model, laptop2.model
from Laptop as laptop1, Laptop as laptop2
where laptop1.ram = laptop2.ram **and** laptop1.speed = laptop2.speed
and laptop1.screen = laptop2.screen

Question 2

a)

Gives the name of the ships that are 'sunk' or 'damaged', the battle it's involved, battle result and where it is built (country name).

b)

select O.ship, O.battle, O.result, C.country 2
from Outcomes O, Ships S, Classes C
where O.ship = S.name **and** S.class = C.class **and** (
O.result="damaged" **or** O.result="sunk")

c)

Result the name, country, type of the ships which are involved in all of the battles.

d)

select name,country,name

```
from Ships as S natural join Classes
where not exist ( (select battle from Outcomes) except
    (select battle from Outcomes as O
    where S.name = O.name))
```

Question 3

a)

```
delete from Laptop
where ram < 1024
```

b)

```
delete from Product  
where type="Printer" and maker in (  
    (select distinct maker from Product) except  
        (select distinct maker from Product  
            where type="PC" or type="Laptop"))
```

c)

```
with man_IBM (model) as (select model from Product where  
                                maker="IBM")  
  
update PC set price = price-100 and ram = ram * 2 and hd = hd * 2  
  
where man_IBM.model = model
```

d)

```
delete from Ships
where name in ( select distinct name from Battle
                  where result = "Sunk")
```