

CSC E 520

5.15

a. sets;

R	S	T
x y	x y	x y
3 5	3 4	5 4
4 7	4 7	3 4
6 9	6 9	

$R \cap S =$

x y
1 2
4 7
6 9

$(R \cap S) - T =$

x y
1 2
4 7
6 9

$S - T =$

x y
1 2
6 9

$R \cap (S - T) =$

x y
1 2
6 9

This holds for all sets

since any sets of R, S, T
will have the same
intersection with above whether
intersected first or not since
there are no copy of each tuple

b. This holds for all sets since the resulting
set will only contain values in R, S and T, over
to how union and intersection work on sets.

Using R, S, T, T1, T2

$R \cap S \cap T$: 4 rows of 1

$R \cap (S \cap T)$: 4 rows of 1

$R \cap S \cap T$: 4 rows of 1

$R \cap S \cap T$: 3 rows of 1

$R \cap (S \cap T)$: 3 rows of 1

12 12 12
12 12 12

12 0

12 12
12 12

12 12
12 12
12 12

R	S	T
x y	x y	x y
1 2	1 2	1 2
3 4	3 4	3 4
5 6	5 6	5 6
7 8	7 8	7 8
9 10	9 10	9 10

$R \cap S =$
 $(R \cap S) - T =$

x y
1 2
3 4
5 6
7 8
9 10

$S - T =$

x y
1 2
3 4
5 6
7 8
9 10

$R \cap (S - T) =$

x y
1 2
3 4
5 6
7 8
9 10

C. Applying two conditions to a set @ Prior simultaneously
or one at a time will produce the same result.

Using $R_1 =$

x	x
1	1
2	2
2	2
3	3

$C: x > 1, D: x > 1.$

$\sigma_{x > 1 \vee D > 1}(R) =$

x	y
2	2
2	2
3	3

$\sigma_{x > 1}(R) \cup \sigma_{D > 1}(R) =$

x	y
2	2
2	2
2	2
2	2
3	3
3	3

$\sigma_{x > 1}(R) \cup \sigma_{D > 1}(R) =$

x	y
2	2
2	2
3	3
3	3

6.15

a. $\begin{matrix} a & b \\ 10 & 20 \\ 20 & 20 \end{matrix}$, where a, b can be any integer or NULL

b. $\begin{matrix} a & b \\ x & y \end{matrix}$ where $x \neq \text{NULL}$ and b is an integer.

d. $\begin{matrix} a & b \\ x & x \end{matrix}$, where x is an integer and b is not NULL

3)

a.

```
Command Prompt - mysql -u dfs -p
ERROR 1248 (42000): Every derived table must have its own alias
mysql> SELECT AVG(price) AS AvgPrice
  -> FROM (SELECT price,model FROM PC UNION SELECT price,model FROM LAPTOP) AS Combo
  -> WHERE model IN (SELECT model FROM Product WHERE maker = 'D');
+-----+
| AvgPrice |
+-----+
| 730.0000 |
+-----+
1 row in set (0.00 sec)

mysql> SELECT maker
  -> FROM Product
  -> WHERE model IN (SELECT model FROM PC WHERE speed >= 3.0);
+-----+
| maker |
+-----+
| B      |
| B      |
| B      |
| D      |
| E      |
| E      |
+-----+
6 rows in set (0.01 sec)
```

b.

```
mysql> SELECT MAX(price) AS maxPrice FROM (SELECT price FROM Printer);
ERROR 1248 (42000): Every derived table must have its own alias
mysql> SELECT MAX(price) AS maxPrice FROM (SELECT price FROM Printer) AS alias;
+-----+
| maxPrice |
+-----+
| 899      |
+-----+
1 row in set (0.00 sec)
```

c.

```
Command Prompt - mysql -u dfs -p
+-----+
| 899 |
+-----+
1 row in set (0.00 sec)

mysql> SELECT *
  -> FROM Laptop
  -> WHERE speed < ANY (SELECT speed
  -> FROM PC);
+-----+
| model | speed | ram | hd | screen | price |
+-----+
| 2001 | 2 | 2048 | 240 | 20 | 3673 |
| 2002 | 2 | 1024 | 80 | 17 | 949 |
| 2003 | 2 | 512 | 60 | 15 | 549 |
| 2004 | 2 | 512 | 60 | 13 | 1150 |
| 2005 | 2 | 1024 | 120 | 17 | 2500 |
| 2006 | 2 | 2048 | 80 | 15 | 1700 |
| 2007 | 2 | 1024 | 120 | 13 | 1429 |
| 2008 | 2 | 1024 | 160 | 15 | 900 |
| 2009 | 2 | 512 | 80 | 14 | 680 |
| 2010 | 2 | 2048 | 160 | 15 | 2300 |
+-----+
10 rows in set (0.00 sec)
```

d.

```
mysql> SELECT model
  -> FROM (SELECT model,price FROM PC UNION SELECT model,price FROM Laptop UNION SELECT model,price FROM Printer) as AllThree
  -> WHERE price IN (
  -> SELECT MAX(price) FROM (SELECT model,price FROM PC UNION SELECT model,price FROM Laptop UNION SELECT model,price FROM Printer) AS allThree);
+-----+
| model |
+-----+
| 2001 |
+-----+
1 row in set (0.00 sec)
```

e.

```
mysql> SELECT maker
-> FROM Product
-> WHERE model IN (
-> SELECT model
-> FROM Printer
-> WHERE price = (SELECT MIN(price) FROM Printer WHERE color = TRUE));
+-----+
| maker |
+-----+
| E     |
+-----+
1 row in set (0.00 sec)
```

f.

```
Command Prompt - mysql -u zfs -p
mysql> SELECT maker
-> FROM Product
-> WHERE model IN (
-> SELECT model
-> FROM PC
-> WHERE speed = (SELECT MAX(speed) FROM PC WHERE ram = (SELECT MIN(ram) FROM PC)) AND ram = (SELECT MIN(ram) FROM PC));
+-----+
| maker |
+-----+
| B     |
| E     |
+-----+
2 rows in set (0.00 sec)

mysql> _
```

4) d.

```
Command Prompt - mysql -u zfs -p
-> WHERE model IN (
-> SELECT model
-> FROM PC
-> WHERE speed = (SELECT MAX(speed) FROM PC WHERE ram = (SELECT MIN(ram) FROM PC)) AND ram = (SELECT MIN(ram) FROM PC));
+-----+
| maker |
+-----+
| B     |
| E     |
+-----+
2 rows in set (0.00 sec)

mysql> SELECT AVG(price) as AvgPrice
-> FROM (SELECT price,model FROM PC UNION SELECT price,model FROM LAPTOP)
-> WHERE model IN (SELECT model FROM Product WHERE maker = 'D');
ERROR 1248 (42000): Every derived table must have its own alias
mysql> SELECT AVG(price) as AvgPrice
-> FROM (SELECT price,model FROM PC UNION SELECT price,model FROM LAPTOP) AS Combo
-> WHERE model IN (SELECT model FROM Product WHERE maker = 'D');
+-----+
| AvgPrice |
+-----+
| 730.0000 |
+-----+
1 row in set (0.00 sec)

mysql>
```