CIS/CSC384

HomeWork 4: Due Mar 24, 11:59 pm (via bb)

For each question, note down your confidence level between 0 – 10, with 0 indicating the lowest level of confidence and 10 indicating the highest level of confidence.

Consider the following three tables: PC, Laptop and Product, and the data as given.

model	speed	ram	hd	price
1001	2.66	1024	250	2114
1002	2.10	512	250	995
1003	1.42	512	80	478
1004	2.80	1024	250	649
1005	3.20	512	250	630
1006	3.20	1024	320	1049
1007	2.20	1024	200	510
1008	2.20	2048	250	770
1009	2.00	1024	250	650
1010	2.80	2048	300	770
1011	1.86	2048	160	959
1012	2.80	1024	160	649
1013	3.06	512	80	529

Sample Data for PC

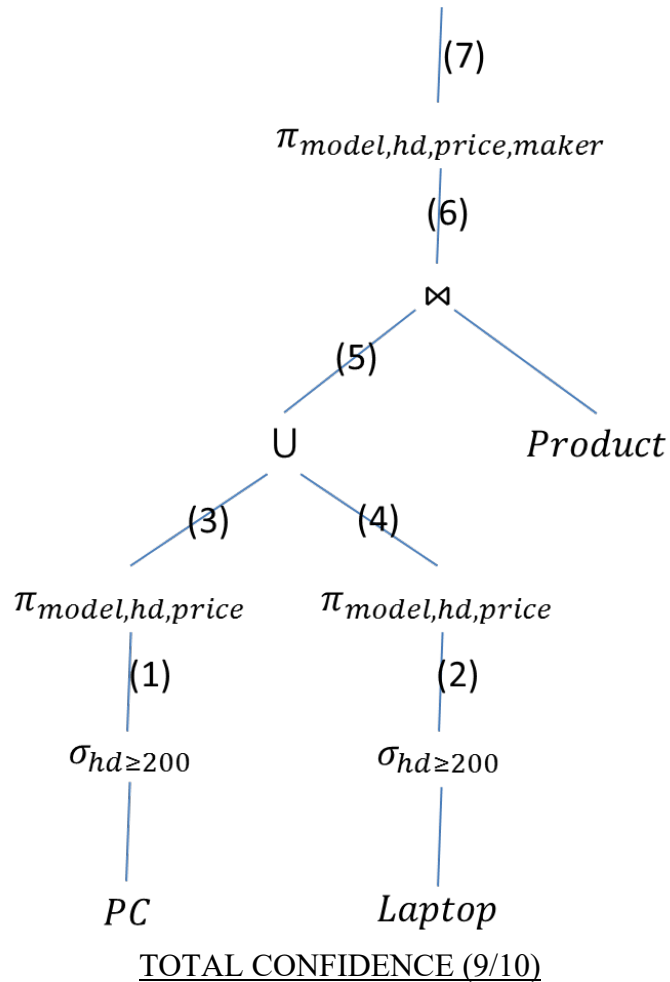| model	speed	ram	hd	screen	price
2001	2.00	2048	240	20.1	3673
2002	1.73	1024	80	17.0	949
2003	1.80	512	60	15.4	549
2004	2.00	512	60	13.3	1150
2005	2.16	1024	120	17.0	2500
2006	2.00	2048	80	15.4	1700
2007	1.83	1024	120	13.3	1429
2008	1.60	1024	100	15.4	900
2009	1.60	512	80	14.1	680
2010	2.00	2048	160	15.4	2300

Sample Data for Laptop

maker	model	type
A	1001	PC
A	1002	PC
A	1003	PC
A	2004	Laptop
A	2005	Laptop
A	2006	Laptop
B	1004	PC
B	1005	PC
B	1006	PC
B	2007	Laptop
C	1007	PC
D	1008	PC
D	1009	PC
D	1010	PC
D	3004	Printer
D	3005	Printer
E	1011	PC
E	1012	PC
E	1013	PC
E	2001	Laptop
E	2002	Laptop
E	2003	Laptop
E	3001	Printer
E	3002	Printer
E	3003	Printer
F	2008	Laptop
F	2009	Laptop
G	2010	Laptop
H	3006	Printer
H	3007	Printer

Sample Data for Product

Compute the results for the plans below, for each of the steps labeled with a number. When reporting the result, you must include the names of the columns of each result table, along with the data.

Note: You can report your confidence level for each of the steps for each question (or) you can report one confidence level for all the steps for a question.

Plan 1: Compute the results for steps labeled (1) ... (7) [5 pts]

|(7)

$\pi_{model,hd,price,maker}$

(6)

⋈

(5)

U   Product

(3)   (4)

$\pi_{model,hd,price}$ $\pi_{model,hd,price}$

(1)   (2)

$\sigma_{hd \geq 200}$ $\sigma_{hd \geq 200}$

PC   Laptop

TOTAL CONFIDENCE (9/10)

1. SELECT * FROM PC WHERE hd >= 200;

	PCMODEL	SPEED	RAM	HD	PRICE
1	1001	2.66	1024	250	2114
2	1002	2.1	512	250	995
3	1004	2.8	1024	250	649
4	1005	3.2	512	250	630
5	1006	3.2	1024	320	1049
6	1007	2.2	1024	200	510
7	1008	2.2	2048	250	770
8	1009	2	1024	250	650
9	1010	2.8	2048	300	770

2. SELECT * FROM Laptop WHERE hd >= 200;

	PCMODEL	SPEED	RAM	HD	SCREEN	PRICE
1	2001	2	2048	240	20.1	3673

3. SELECT pcmodel, hd, price FROM (SELECT * FROM PC WHERE hd >= 200);

	PCMODEL	HD	PRICE
1	1001	250	2114
2	1002	250	995
3	1004	250	649
4	1005	250	630
5	1006	320	1049
6	1007	200	510
7	1008	250	770
8	1009	250	650
9	1010	300	770

4. SELECT pcmodel, hd, price FROM (SELECT * FROM Laptop WHERE hd >= 200);

	PCMODEL	HD	PRICE
1	2001	240	3673

5. (SELECT pcmodel, hd, price FROM (SELECT * FROM PC WHERE hd >= 200))UNION(SELECT pcmodel, hd, price FROM (SELECT * FROM Laptop WHERE hd >= 200));

	PCMODEL	HD	PRICE
1	1001	250	2114
2	1002	250	995
3	1004	250	649
4	1005	250	630
5	1006	320	1049
6	1007	200	510
7	1008	250	770
8	1009	250	650
9	1010	300	770
10	2001	240	3673

6. SELECT * FROM ((SELECT pcmodel, hd, price FROM (SELECT * FROM PC WHERE hd >= 200))
   UNION (SELECT pcmodel, hd, price FROM (SELECT * FROM Laptop WHERE hd >= 200))) NATURAL
   JOIN PRODUCT;

7. SELECT pcmodel, hd, price, maker FROM (SELECT * FROM((SELECT pcmodel, hd, price FROM (SELECT * FROM PC WHERE hd >= 200)) UNION (SELECT pcmodel, hd, price FROM (SELECT * FROM Laptop WHERE hd >= 200))) NATURAL JOIN PRODUCT);

PCMODEL	HD	PRICE	MAKER
1001	250	2114	A
1001	250	2114	A
1001	250	2114	A
1001	250	2114	A
1001	250	2114	A
1001	250	2114	A
1001	250	2114	B
1001	250	2114	B
1001	250	2114	B
1001	250	2114	B
1001	250	2114	C
1001	250	2114	D
1001	250	2114	D
1001	250	2114	D
1001	250	2114	D
1001	250	2114	D
1001	250	2114	E
1001	250	2114	E
1001	250	2114	E
1001	250	2114	E
1001	250	2114	E
1001	250	2114	E
1001	250	2114	E
1001	250	2114	E
1001	250	2114	E
1001	250	2114	F
1001	250	2114	F
1001	250	2114	G
1001	250	2114	H
1001	250	2114	H
1002	250	995	A

PCMODEL	HD	PRICE	MAKER
1002	250	995	A
1002	250	995	A
1002	250	995	A
1002	250	995	A
1002	250	995	A
1002	250	995	B
1002	250	995	B
1002	250	995	B
1002	250	995	B
1002	250	995	C
1002	250	995	D
1002	250	995	D
1002	250	995	D
1002	250	995	D
1002	250	995	D
1002	250	995	E
1002	250	995	E
1002	250	995	E
1002	250	995	E
1002	250	995	E
1002	250	995	E
1002	250	995	E
1002	250	995	E
1002	250	995	E
1002	250	995	F
1002	250	995	F
1002	250	995	G
1002	250	995	H
1002	250	995	H
1004	250	649	A
1004	250	649	A

PCMODEL	HD	PRICE	MAKER
1004	250	649	A
1004	250	649	A
1004	250	649	A
1004	250	649	A
1004	250	649	B
1004	250	649	B
1004	250	649	B
1004	250	649	B
1004	250	649	C
1004	250	649	D
1004	250	649	D
1004	250	649	D
1004	250	649	D
1004	250	649	D
1004	250	649	E
1004	250	649	E
1004	250	649	E
1004	250	649	E
1004	250	649	E
1004	250	649	E
1004	250	649	E
1004	250	649	E
1004	250	649	E
1004	250	649	F
1004	250	649	F
1004	250	649	G
1004	250	649	H
1004	250	649	H
1005	250	630	A
1005	250	630	A
1005	250	630	A

PCMODEL	HD	PRICE	MAKER
1005	250	630	A
1005	250	630	A
1005	250	630	A
1005	250	630	B
1005	250	630	B
1005	250	630	B
1005	250	630	B
1005	250	630	C
1005	250	630	D
1005	250	630	D
1005	250	630	D
1005	250	630	D
1005	250	630	D
1005	250	630	E
1005	250	630	E
1005	250	630	E
1005	250	630	E
1005	250	630	E
1005	250	630	E
1005	250	630	E
1005	250	630	E
1005	250	630	E
1005	250	630	F
1005	250	630	F
1005	250	630	G
1005	250	630	H
1005	250	630	H
1006	320	1049	A
1006	320	1049	A
1006	320	1049	A
1006	320	1049	A

PCMODEL	HD	PRICE	MAKER
1006	320	1049	A
1006	320	1049	A
1006	320	1049	B
1006	320	1049	B
1006	320	1049	B
1006	320	1049	B
1006	320	1049	C
1006	320	1049	D
1006	320	1049	D
1006	320	1049	D
1006	320	1049	D
1006	320	1049	D
1006	320	1049	E
1006	320	1049	E
1006	320	1049	E
1006	320	1049	E
1006	320	1049	E
1006	320	1049	E
1006	320	1049	E
1006	320	1049	E
1006	320	1049	E
1006	320	1049	F
1006	320	1049	F
1006	320	1049	G
1006	320	1049	H
1006	320	1049	H
1007	200	510	A
1007	200	510	A
1007	200	510	A
1007	200	510	A
1007	200	510	A

PCMODEL	HD	PRICE	MAKER
1007	200	510	A
1007	200	510	B
1007	200	510	B
1007	200	510	B
1007	200	510	B
1007	200	510	C
1007	200	510	D
1007	200	510	D
1007	200	510	D
1007	200	510	D
1007	200	510	D
1007	200	510	E
1007	200	510	E
1007	200	510	E
1007	200	510	E
1007	200	510	E
1007	200	510	E
1007	200	510	E
1007	200	510	E
1007	200	510	E
1007	200	510	F
1007	200	510	F
1007	200	510	G
1007	200	510	H
1007	200	510	H
1008	250	770	A
1008	250	770	A
1008	250	770	A
1008	250	770	A
1008	250	770	A
1008	250	770	A

PCMODEL	HD	PRICE	MAKER
1008	250	770	B
1008	250	770	B
1008	250	770	B
1008	250	770	B
1008	250	770	C
1008	250	770	D
1008	250	770	D
1008	250	770	D
1008	250	770	D
1008	250	770	D
1008	250	770	E
1008	250	770	E
1008	250	770	E
1008	250	770	E
1008	250	770	E
1008	250	770	E
1008	250	770	E
1008	250	770	E
1008	250	770	E
1008	250	770	F
1008	250	770	F
1008	250	770	G
1008	250	770	H
1008	250	770	H
1009	250	650	A
1009	250	650	A
1009	250	650	A
1009	250	650	A
1009	250	650	A
1009	250	650	A
1009	250	650	B

PCMODEL	HD	PRICE	MAKER
1009	250	650	B
1009	250	650	B
1009	250	650	B
1009	250	650	C
1009	250	650	D
1009	250	650	D
1009	250	650	D
1009	250	650	D
1009	250	650	D
1009	250	650	E
1009	250	650	E
1009	250	650	E
1009	250	650	E
1009	250	650	E
1009	250	650	E
1009	250	650	E
1009	250	650	E
1009	250	650	E
1009	250	650	F
1009	250	650	F
1009	250	650	G
1009	250	650	H
1009	250	650	H
1010	300	770	A
1010	300	770	A
1010	300	770	A
1010	300	770	A
1010	300	770	A
1010	300	770	A
1010	300	770	B
1010	300	770	B

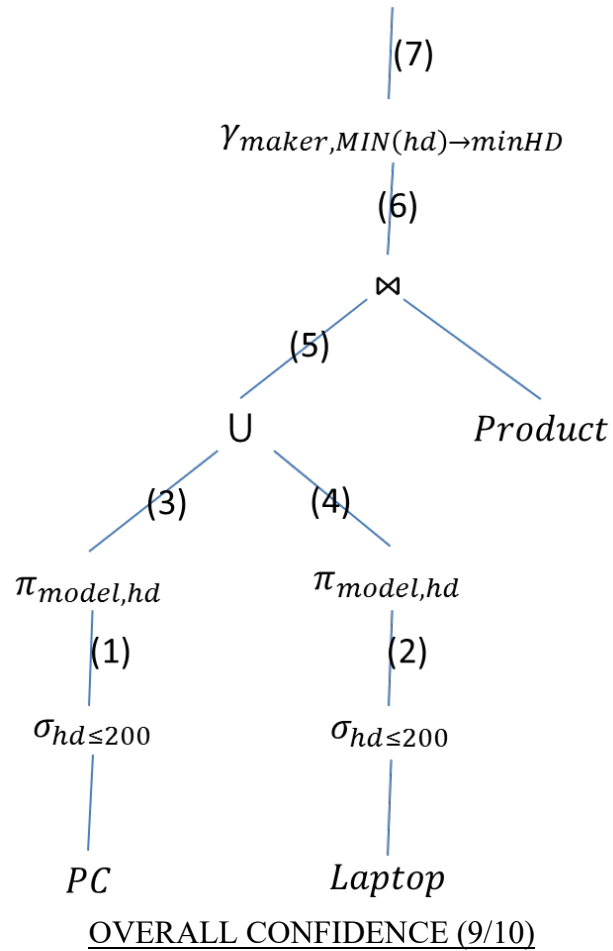| PCMODEL	HD	PRICE	MAKER
1010	300	770	B
1010	300	770	B
1010	300	770	C
1010	300	770	D
1010	300	770	D
1010	300	770	D
1010	300	770	D
1010	300	770	D
1010	300	770	E
1010	300	770	E
1010	300	770	E
1010	300	770	E
1010	300	770	E
1010	300	770	E
1010	300	770	E
1010	300	770	E
1010	300	770	F
1010	300	770	F
1010	300	770	G
1010	300	770	H
1010	300	770	H
2001	240	3673	A
2001	240	3673	A
2001	240	3673	A
2001	240	3673	A
2001	240	3673	A
2001	240	3673	A
2001	240	3673	B
2001	240	3673	B
2001	240	3673	B

PCMODEL	HD	PRICE	MAKER
2001	240	3673	B
2001	240	3673	C
2001	240	3673	D
2001	240	3673	D
2001	240	3673	D
2001	240	3673	D
2001	240	3673	D
2001	240	3673	E
2001	240	3673	E
2001	240	3673	E
2001	240	3673	E
2001	240	3673	E
2001	240	3673	E
2001	240	3673	E
2001	240	3673	E
2001	240	3673	E
2001	240	3673	F
2001	240	3673	F
2001	240	3673	G
2001	240	3673	H
2001	240	3673	H

```sql
SELECT DISTINCT pcmodel, hd, price, maker FROM
(SELECT * FROM
((SELECT pcmodel, hd, price  FROM (
SELECT *  FROM PC WHERE hd >= 200))
UNION
(SELECT pcmodel, hd, price FROM (
SELECT * FROM Laptop WHERE hd >= 200)))
NATURAL JOIN
PRODUCT);
```

PCMODEL	HD	PRICE	MAKER
1001	250	2114	D
1001	250	2114	F
1002	250	995	C
1005	250	630	B
1007	200	510	A
1009	250	650	A
2001	240	3673	G
2001	240	3673	H
1001	250	2114	H
1002	250	995	A
1002	250	995	D
1004	250	649	H
1005	250	630	G
1006	320	1049	C
1006	320	1049	E
1007	200	510	C
1007	200	510	G
1007	200	510	H
1008	250	770	D
1008	250	770	E
1010	300	770	D
1010	300	770	F
2001	240	3673	C
2001	240	3673	F
1001	250	2114	A
1001	250	2114	B
1001	250	2114	C
1004	250	649	C
1004	250	649	D
1004	250	649	E
1006	320	1049	G

PCMODEL	HD	PRICE	MAKER
1009	250	650	B
1009	250	650	D
1009	250	650	F
1006	320	1049	D
1007	200	510	D
1008	250	770	A
1010	300	770	A
1010	300	770	G
1002	250	995	B
1005	250	630	C
1006	320	1049	B
1006	320	1049	F
1007	200	510	E
1010	300	770	E
1001	250	2114	E
1004	250	649	A
1005	250	630	E
1005	250	630	F
1005	250	630	H
1006	320	1049	A
1007	200	510	B
1008	250	770	F
1008	250	770	G
1010	300	770	H
2001	240	3673	D
1001	250	2114	G
1002	250	995	H
1004	250	649	B
1004	250	649	F
1004	250	649	G
1005	250	630	D

PCMODEL	HD	PRICE	MAKER
1006	320	1049	H
1007	200	510	F
1008	250	770	C
1009	250	650	H
1010	300	770	B
1010	300	770	C
2001	240	3673	A
1002	250	995	E
1002	250	995	F
1002	250	995	G
1005	250	630	A
1008	250	770	B
1008	250	770	H
1009	250	650	C
1009	250	650	E
1009	250	650	G
2001	240	3673	B
2001	240	3673	E

Plan 2: Compute the results for steps labeled (1) … (7) [5 pts]

(7)

$\gamma_{maker,MIN(hd)\rightarrow minHD}$

(6)

⋈

(5)   Product

U

(3)   (4)

$\pi_{model,hd}$ $\pi_{model,hd}$

(1)   (2)

$\sigma_{hd\leq200}$ $\sigma_{hd\leq200}$

PC   Laptop

OVERALL CONFIDENCE (9/10)

1. SELECT * FROM PC WHERE hd <= 200;

	PCMODEL	SPEED	RAM	HD	PRICE
1	1003	1.42	512	80	478
2	1007	2.2	1024	200	510
3	1011	1.86	2048	160	959
4	1012	2.8	1024	160	649
5	1013	3.06	512	80	529

2. SELECT * FROM Laptop WHERE hd <= 200;

	PCMODEL	SPEED	RAM	HD	SCREEN	PRICE
1	2002	1.73	1024	80	17	949
2	2003	1.8	512	60	15.4	549
3	2004	2	512	60	13.3	1150
4	2005	2.16	1024	120	17	2500
5	2006	2	2048	80	15.4	1700
6	2007	1.83	1024	120	13.3	1429
7	2008	1.6	1024	100	15.4	900
8	2009	1.6	512	80	14.1	680
9	2010	2	2048	160	15.4	2300
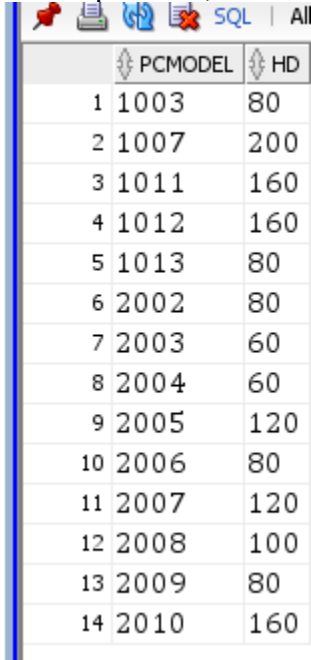
3. SELECT pcmodel, hd FROM (SELECT * FROM PC WHERE hd <= 200);

	PCMODEL	HD
1	1003	80
2	1007	200
3	1011	160
4	1012	160
5	1013	80

4. SELECT pcmodel, hd FROM (SELECT * FROM Laptop WHERE hd <= 200);

	PCMODEL	HD
1	2002	80
2	2003	60
3	2004	60
4	2005	120
5	2006	80
6	2007	120
7	2008	100
8	2009	80
9	2010	160

5. (SELECT pcmodel, hd FROM (SELECT * FROM PC WHERE hd <= 200)) UNION
   (SELECT pcmodel, hd FROM (SELECT * FROM Laptop WHERE hd <= 200));

	PCMODEL	HD
1	1003	80
2	1007	200
3	1011	160
4	1012	160
5	1013	80
6	2002	80
7	2003	60
8	2004	60
9	2005	120
10	2006	80
11	2007	120
12	2008	100
13	2009	80
14	2010	160

6. SELECT * FROM ((SELECT pcmodel, hd FROM (SELECT * FROM PC WHERE hd
   <= 200)) UNION (SELECT pcmodel, hd FROM (SELECT * FROM Laptop WHERE hd

<= 200))) NATURAL JOIN PRODUCT;

PCMODEL	HD	PMODEL	MAKER	PTYPE
1007	200	1002	A	PC
1007	200	1003	A	PC
1007	200	2004	A	Laptop
1007	200	2005	A	Laptop
1007	200	2006	A	Laptop
1007	200	1004	B	PC
1007	200	1005	B	PC
1007	200	1006	B	PC
1007	200	2007	B	Laptop
1007	200	1007	C	PC
1007	200	1008	D	PC
1007	200	1009	D	PC
1007	200	1010	D	PC
1007	200	3004	D	Printer
1007	200	3005	D	Printer
1007	200	1011	E	PC
1007	200	1012	E	PC
1007	200	1013	E	PC
1007	200	2001	E	Laptop
1007	200	2002	E	Laptop
1007	200	2003	E	Laptop
1007	200	3001	E	Printer
1007	200	3002	E	Printer
1007	200	3003	E	Printer
1007	200	2008	F	Laptop
1007	200	2009	F	Laptop
1007	200	2010	G	Laptop
1007	200	3006	H	Printer
1007	200	3007	H	Printer
1011	160	1001	A	PC
1011	160	1002	A	PC

PCMODEL	HD	PMODEL	MAKER	PTYPE
1011	160	1003	A	PC
1011	160	2004	A	Laptop
1011	160	2005	A	Laptop
1011	160	2006	A	Laptop
1011	160	1004	B	PC
1011	160	1005	B	PC
1011	160	1006	B	PC
1011	160	2007	B	Laptop
1011	160	1007	C	PC
1011	160	1008	D	PC
1011	160	1009	D	PC
1011	160	1010	D	PC
1011	160	3004	D	Printer
1011	160	3005	D	Printer
1011	160	1011	E	PC
1011	160	1012	E	PC
1011	160	1013	E	PC
1011	160	2001	E	Laptop
1011	160	2002	E	Laptop
1011	160	2003	E	Laptop
1011	160	3001	E	Printer
1011	160	3002	E	Printer
1011	160	3003	E	Printer
1011	160	2008	F	Laptop
1011	160	2009	F	Laptop
1011	160	2010	G	Laptop
1011	160	3006	H	Printer
1011	160	3007	H	Printer
1012	160	1001	A	PC
1012	160	1002	A	PC
1012	160	1003	A	PC

PCMODEL	HD	PMODEL	MAKER	PTYPE
1012	160	2004	A	Laptop
1012	160	2005	A	Laptop
1012	160	2006	A	Laptop
1012	160	1004	B	PC
1012	160	1005	B	PC
1012	160	1006	B	PC
1012	160	2007	B	Laptop
1012	160	1007	C	PC
1012	160	1008	D	PC
1012	160	1009	D	PC
1012	160	1010	D	PC
1012	160	3004	D	Printer
1012	160	3005	D	Printer
1012	160	1011	E	PC
1012	160	1012	E	PC
1012	160	1013	E	PC
1012	160	2001	E	Laptop
1012	160	2002	E	Laptop
1012	160	2003	E	Laptop
1012	160	3001	E	Printer
1012	160	3002	E	Printer
1012	160	3003	E	Printer
1012	160	2008	F	Laptop
1012	160	2009	F	Laptop
1012	160	2010	G	Laptop
1012	160	3006	H	Printer
1012	160	3007	H	Printer
1013	80	1001	A	PC
1013	80	1002	A	PC
1013	80	1003	A	PC
1013	80	2004	A	Laptop

PCMODEL	HD	PMODEL	MAKER	PTYPE
1013	80	2005	A	Laptop
1013	80	2006	A	Laptop
1013	80	1004	B	PC
1013	80	1005	B	PC
1013	80	1006	B	PC
1013	80	2007	B	Laptop
1013	80	1007	C	PC
1013	80	1008	D	PC
1013	80	1009	D	PC
1013	80	1010	D	PC
1013	80	3004	D	Printer
1013	80	3005	D	Printer
1013	80	1011	E	PC
1013	80	1012	E	PC
1013	80	1013	E	PC
1013	80	2001	E	Laptop
1013	80	2002	E	Laptop
1013	80	2003	E	Laptop
1013	80	3001	E	Printer
1013	80	3002	E	Printer
1013	80	3003	E	Printer
1013	80	2008	F	Laptop
1013	80	2009	F	Laptop
1013	80	2010	G	Laptop
1013	80	3006	H	Printer
1013	80	3007	H	Printer
2002	80	1001	A	PC
2002	80	1002	A	PC
2002	80	1003	A	PC
2002	80	2004	A	Laptop
2002	80	2005	A	Laptop

PCMODEL	HD	PMODEL	MAKER	PTYPE
2002	80	2006	A	Laptop
2002	80	1004	B	PC
2002	80	1005	B	PC
2002	80	1006	B	PC
2002	80	2007	B	Laptop
2002	80	1007	C	PC
2002	80	1008	D	PC
2002	80	1009	D	PC
2002	80	1010	D	PC
2002	80	3004	D	Printer
2002	80	3005	D	Printer
2002	80	1011	E	PC
2002	80	1012	E	PC
2002	80	1013	E	PC
2002	80	2001	E	Laptop
2002	80	2002	E	Laptop
2002	80	2003	E	Laptop
2002	80	3001	E	Printer
2002	80	3002	E	Printer
2002	80	3003	E	Printer
2002	80	2008	F	Laptop
2002	80	2009	F	Laptop
2002	80	2010	G	Laptop
2002	80	3006	H	Printer
2002	80	3007	H	Printer
2003	60	1001	A	PC
2003	60	1002	A	PC
2003	60	1003	A	PC
2003	60	2004	A	Laptop
2003	60	2005	A	Laptop
2003	60	2006	A	Laptop

PCMODEL	HD	PMODEL	MAKER	PTYPE
2003	60	1004	B	PC
2003	60	1005	B	PC
2003	60	1006	B	PC
2003	60	2007	B	Laptop
2003	60	1007	C	PC
2003	60	1008	D	PC
2003	60	1009	D	PC
2003	60	1010	D	PC
2003	60	3004	D	Printer
2003	60	3005	D	Printer
2003	60	1011	E	PC
2003	60	1012	E	PC
2003	60	1013	E	PC
2003	60	2001	E	Laptop
2003	60	2002	E	Laptop
2003	60	2003	E	Laptop
2003	60	3001	E	Printer
2003	60	3002	E	Printer
2003	60	3003	E	Printer
2003	60	2008	F	Laptop
2003	60	2009	F	Laptop
2003	60	2010	G	Laptop
2003	60	3006	H	Printer
2003	60	3007	H	Printer
2004	60	1001	A	PC
2004	60	1002	A	PC
2004	60	1003	A	PC
2004	60	2004	A	Laptop
2004	60	2005	A	Laptop
2004	60	2006	A	Laptop
2004	60	1004	B	PC

PCMODEL	HD	PMODEL	MAKER	PTYPE
2004	60	1005	B	PC
2004	60	1006	B	PC
2004	60	2007	B	Laptop
2004	60	1007	C	PC
2004	60	1008	D	PC
2004	60	1009	D	PC
2004	60	1010	D	PC
2004	60	3004	D	Printer
2004	60	3005	D	Printer
2004	60	1011	E	PC
2004	60	1012	E	PC
2004	60	1013	E	PC
2004	60	2001	E	Laptop
2004	60	2002	E	Laptop
2004	60	2003	E	Laptop
2004	60	3001	E	Printer
2004	60	3002	E	Printer
2004	60	3003	E	Printer
2004	60	2008	F	Laptop
2004	60	2009	F	Laptop
2004	60	2010	G	Laptop
2004	60	3006	H	Printer
2004	60	3007	H	Printer
2005	120	1001	A	PC
2005	120	1002	A	PC
2005	120	1003	A	PC
2005	120	2004	A	Laptop
2005	120	2005	A	Laptop
2005	120	2006	A	Laptop
2005	120	1004	B	PC
2005	120	1005	B	PC

PCMODEL	HD	PMODEL	MAKER	PTYPE
2005	120	1006	B	PC
2005	120	2007	B	Laptop
2005	120	1007	C	PC
2005	120	1008	D	PC
2005	120	1009	D	PC
2005	120	1010	D	PC
2005	120	3004	D	Printer
2005	120	3005	D	Printer
2005	120	1011	E	PC
2005	120	1012	E	PC
2005	120	1013	E	PC
2005	120	2001	E	Laptop
2005	120	2002	E	Laptop
2005	120	2003	E	Laptop
2005	120	3001	E	Printer
2005	120	3002	E	Printer
2005	120	3003	E	Printer
2005	120	2008	F	Laptop
2005	120	2009	F	Laptop
2005	120	2010	G	Laptop
2005	120	3006	H	Printer
2005	120	3007	H	Printer
2006	80	1001	A	PC
2006	80	1002	A	PC
2006	80	1003	A	PC
2006	80	2004	A	Laptop
2006	80	2005	A	Laptop
2006	80	2006	A	Laptop
2006	80	1004	B	PC
2006	80	1005	B	PC
2006	80	1006	B	PC

PCMODEL	HD	PMODEL	MAKER	PTYPE
2006	80	2007	B	Laptop
2006	80	1007	C	PC
2006	80	1008	D	PC
2006	80	1009	D	PC
2006	80	1010	D	PC
2006	80	3004	D	Printer
2006	80	3005	D	Printer
2006	80	1011	E	PC
2006	80	1012	E	PC
2006	80	1013	E	PC
2006	80	2001	E	Laptop
2006	80	2002	E	Laptop
2006	80	2003	E	Laptop
2006	80	3001	E	Printer
2006	80	3002	E	Printer
2006	80	3003	E	Printer
2006	80	2008	F	Laptop
2006	80	2009	F	Laptop
2006	80	2010	G	Laptop
2006	80	3006	H	Printer
2006	80	3007	H	Printer
2007	120	1001	A	PC
2007	120	1002	A	PC
2007	120	1003	A	PC
2007	120	2004	A	Laptop
2007	120	2005	A	Laptop
2007	120	2006	A	Laptop
2007	120	1004	B	PC
2007	120	1005	B	PC
2007	120	1006	B	PC
2007	120	2007	B	Laptop

PCMODEL	HD	PMODEL	MAKER	PTYPE
2007	120	1007	C	PC
2007	120	1008	D	PC
2007	120	1009	D	PC
2007	120	1010	D	PC
2007	120	3004	D	Printer
2007	120	3005	D	Printer
2007	120	1011	E	PC
2007	120	1012	E	PC
2007	120	1013	E	PC
2007	120	2001	E	Laptop
2007	120	2002	E	Laptop
2007	120	2003	E	Laptop
2007	120	3001	E	Printer
2007	120	3002	E	Printer
2007	120	3003	E	Printer
2007	120	2008	F	Laptop
2007	120	2009	F	Laptop
2007	120	2010	G	Laptop
2007	120	3006	H	Printer
2007	120	3007	H	Printer
2008	100	1001	A	PC
2008	100	1002	A	PC
2008	100	1003	A	PC
2008	100	2004	A	Laptop
2008	100	2005	A	Laptop
2008	100	2006	A	Laptop
2008	100	1004	B	PC
2008	100	1005	B	PC
2008	100	1006	B	PC
2008	100	2007	B	Laptop
2008	100	1007	C	PC

PCMODEL	HD	PMODEL	MAKER	PTYPE
2008	100	1008	D	PC
2008	100	1009	D	PC
2008	100	1010	D	PC
2008	100	3004	D	Printer
2008	100	3005	D	Printer
2008	100	1011	E	PC
2008	100	1012	E	PC
2008	100	1013	E	PC
2008	100	2001	E	Laptop
2008	100	2002	E	Laptop
2008	100	2003	E	Laptop
2008	100	3001	E	Printer
2008	100	3002	E	Printer
2008	100	3003	E	Printer
2008	100	2008	F	Laptop
2008	100	2009	F	Laptop
2008	100	2010	G	Laptop
2008	100	3006	H	Printer
2008	100	3007	H	Printer
2009	80	1001	A	PC
2009	80	1002	A	PC
2009	80	1003	A	PC
2009	80	2004	A	Laptop
2009	80	2005	A	Laptop
2009	80	2006	A	Laptop
2009	80	1004	B	PC
2009	80	1005	B	PC
2009	80	1006	B	PC
2009	80	2007	B	Laptop
2009	80	1007	C	PC
2009	80	1008	D	PC

PCMODEL	HD	PMODEL	MAKER	PTYPE
2009	80	1009	D	PC
2009	80	1010	D	PC
2009	80	3004	D	Printer
2009	80	3005	D	Printer
2009	80	1011	E	PC
2009	80	1012	E	PC
2009	80	1013	E	PC
2009	80	2001	E	Laptop
2009	80	2002	E	Laptop
2009	80	2003	E	Laptop
2009	80	3001	E	Printer
2009	80	3002	E	Printer
2009	80	3003	E	Printer
2009	80	2008	F	Laptop
2009	80	2009	F	Laptop
2009	80	2010	G	Laptop
2009	80	3006	H	Printer
2009	80	3007	H	Printer
2010	160	1001	A	PC
2010	160	1002	A	PC
2010	160	1003	A	PC
2010	160	2004	A	Laptop
2010	160	2005	A	Laptop
2010	160	2006	A	Laptop
2010	160	1004	B	PC
2010	160	1005	B	PC
2010	160	1006	B	PC
2010	160	2007	B	Laptop
2010	160	1007	C	PC
2010	160	1008	D	PC
2010	160	1009	D	PC

PCMODEL	HD	PMODEL	MAKER	PTYPE
2010	160	1010	D	PC
2010	160	3004	D	Printer
2010	160	3005	D	Printer
2010	160	1011	E	PC
2010	160	1012	E	PC
2010	160	1013	E	PC
2010	160	2001	E	Laptop
2010	160	2002	E	Laptop
2010	160	2003	E	Laptop
2010	160	3001	E	Printer
2010	160	3002	E	Printer
2010	160	3003	E	Printer
2010	160	2008	F	Laptop
2010	160	2009	F	Laptop
2010	160	2010	G	Laptop
2010	160	3006	H	Printer
2010	160	3007	H	Printer

7. SELECT maker, hd AS minhd FROM (SELECT * FROM ((SELECT pcmodel, hd FROM (SELECT * FROM PC WHERE hd <= 200)) UNION (SELECT pcmodel, hd FROM (SELECT * FROM Laptop WHERE hd <= 200))) NATURAL JOIN PRODUCT)

WHERE hd <= ALL (SELECT hd FROM ((SELECT pcmodel, hd FROM (SELECT *
FROM PC WHERE hd <= 200)) UNION (SELECT pcmodel, hd FROM (SELECT *
FROM Laptop WHERE hd <= 200))) NATURAL JOIN PRODUCT);

MAKER	MINHD
A	60
A	60
A	60
A	60
A	60
A	60
B	60
B	60
B	60
B	60
C	60
D	60
D	60
D	60
D	60
D	60
E	60
E	60
E	60
E	60
E	60
E	60
E	60
E	60
E	60
F	60
F	60
G	60
H	60
H	60
A	60

MAKER	MINHD
A	60
A	60
A	60
A	60
A	60
B	60
B	60
B	60
B	60
C	60
D	60
D	60
D	60
D	60
D	60
E	60
E	60
E	60
E	60
E	60
E	60
E	60
E	60
E	60
F	60
F	60
G	60
H	60
H	60

UNIQUE SOLUTIONS -------------

SELECT DISTINCT maker, hd AS minhd FROM
(SELECT * FROM
((SELECT pcmodel, hd FROM (
SELECT * FROM PC WHERE hd <= 200))
UNION
(SELECT pcmodel, hd FROM (
SELECT * FROM Laptop WHERE hd <= 200)))
NATURAL JOIN
PRODUCT)
WHERE hd <= ALL
(SELECT hd FROM
((SELECT pcmodel, hd FROM (
SELECT * FROM PC WHERE hd <= 200))
UNION
(SELECT pcmodel, hd FROM (
SELECT * FROM Laptop WHERE hd <= 200)))
NATURAL JOIN
PRODUCT);

	MAKER	MINHD
1	H	60
2	E	60
3	G	60
4	D	60
5	F	60
6	A	60
7	C	60
8	B	60