

DBMS Lab Experiment 3

Name: Om Ashish Mishra

Registration Number: 16BCE0789

The Question:

Consider a database of a Software Stores that stores details of PCs, Printers, and Laptops and it involves the following tables:

Product (maker, model, type);

PC (model, speed, ram, hd, cd, price);

Laptop (model, speed, ram, hd, screen, price);

Printer (model, color, type, price);

The Product relation gives the manufacturer, model number and type (PC, Laptop, Printer) of various products. Assume that model numbers are unique.

The PC relation gives for each model number that is a PC, the speed of the processor in MHz, RAM size in MB, size of hard disk in GB, the speed of the CD reader, and the price.

The Laptop relation is similar, except that the screen size in inches is recorded in the place of CD speed.

The Printer relation records for each printer model, whether the printer produces color output (T, if so), the process type (Laser/Inkjet/Dry) and the price.

- i) Create a table for product, PC, Laptop and printer
- ii) Insert the following values in respective tables. Insert into Product values ('A', 1001, 'PC'); Insert into Product values ('A', 1002, 'PC'); Insert into Product values ('A', 1003, 'PC'); Insert into Product values ('B', 1004, 'PC'); Insert into Product values ('B', 1006, 'PC'); Insert into Product values ('B', 3002, 'Printer'); Insert into Product values ('B', 3004, 'Printer'); Insert into Product values ('C', 1005, 'PC'); Insert into Product values ('C', 1007, 'PC'); Insert into Product values ('D', 1008, 'PC'); Insert into Product values ('D', 1009, 'PC'); Insert into Product values ('D', 1010, 'PC'); Insert into Product values ('D', 2001, 'Laptop'); Insert into Product values ('D', 2002, 'Laptop'); Insert into Product values ('D', 2003, 'Laptop'); Insert into Product values ('D', 3001, 'Printer'); Insert into Product values ('D', 3003, 'Printer'); Insert into Product values ('E', 2004, 'Laptop'); Insert into Product values ('E', 2008, 'Laptop'); Insert into Product values ('F', 2005, 'Laptop'); Insert into Product values ('G', 2006, 'Laptop'); Insert into Product values ('G', 2007, 'Laptop'); Insert into Product values ('H', 3005, 'Printer'); Insert into Product values ('I', 3006, 'Printer'); Insert into Product values ('J', 1011, 'PC'); Insert into PC values (1001, 133, 16, 1.6, '6X', 1595); Insert into PC values (1002, 120, 16, 1.6, '6X', 1399); Insert into PC values (1003,

166, 24, 2.5, '6X', 1899); Insert into PC values (1004, 166, 32, 2.5, '8X', 1999); Insert into PC values (1005, 166, 16, 2.0, '8X', 1999); Insert into PC values (1006, 200, 32, 3.1, '8X', 2099); Insert into PC values (1007, 200, 32, 3.2, '8X', 2349); Insert into PC values (1008, 180, 32, 2.0, '8X', 3699); Insert into PC values (1009, 200, 32, 2.5, '8X', 2599); Insert into PC values (1010, 160, 16, 1.2, '8X', 1495); Insert into PC values (1011, 160, 16, 1.2, '10X', 1495); Insert into Laptop values (2001, 100, 20, 1.1, 9.5, 1999); Insert into Laptop values (2002, 117, 12, 0.75, 11.3, 2499); Insert into Laptop values (2003, 117, 32, 1.00, 10.4, 3599); Insert into Laptop values (2004, 133, 16, 1.10, 11.2, 3499); Insert into Laptop values (2005, 133, 16, 1.00, 11.3, 2599); Insert into Laptop values (2006, 120, 8, 0.81, 12.1, 1999); Insert into Laptop values (2007, 150, 16, 1.35, 12.1, 4799); Insert into Laptop values (2008, 120, 16, 1.10, 12.1, 2099); Insert into Laptop values (2009, 50, 16, 1.10, 12.1, 2099); Insert into Printer values (3001, 'T', 'Inkjet', 275); Insert into Printer values (3002, 'T', 'Inkjet', 269); Insert into Printer values (3003, 'F', 'Laser', 829); Insert into Printer values (3004, 'F', 'Laser', 879); Insert into Printer values (3005, 'F', 'Inkjet', 180); Insert into Printer values (3006, 'T', 'Dry', 470); Insert into Printer values (3007, 'A', 'Dry', 470);

iii) Practice the following queries

1)select * from tablename;

The Answer:

```
SQL> select * from product;
```

MAKER	MODEL
A	1001
PC	
A	1002
PC	
A	1003
PC	
B	1004
PC	
B	1006
PC	
B	3002
PRINTER	
B	3004
PRINTER	
C	1005
PC	
C	1007
PC	
D	1008
PC	
D	1009
PC	
D	1010
PC	
D	2001
LAPTOP	
D	2002
LAPTOP	

MAKER	MODEL
D LAPTOP	2001
D LAPTOP	2002
D LAPTOP	2003
MAKER	MODEL
D PRINTER	3001
D PRINTER	3003
E LAPTOP	2004
MAKER	MODEL
E LAPTOP	2008
F LAPTOP	2005
G LAPTOP	2006
MAKER	MODEL
G LAPTOP	2007
H PRINTER	3005
I PRINTER	3006
MAKER	MODEL
J PC	1011

25 rows selected.

SQL> _

```
$SQL> select * from pc;
```

MODEL	SPEED RAM		
HD	CD		PRICE
1001 1.6	6X	133 16	1595
1002 1.6	6X	120 16	1399
1003 2.5	6X	166 24	1899

MODEL	SPEED RAM		
HD	CD		PRICE
1004 2.5	8X	166 32	1999
1005 2	8X	166 16	1999
1006 3.1	8X	200 32	2099

MODEL	SPEED RAM		
HD	CD		PRICE
1007 3.2	8X	200 32	2349
1008 2	8X	180 32	3699
1009 2.5	8X	200 32	2599

MODEL	SPEED RAM		
HD	CD		PRICE
1010 1.2	8X	160 16	1495
1011 1.2	10X	160 16	1495

```
11 rows selected.
```

```
$SQL> _
```

```
$SQL> select * from laptop;
```

MODEL	SPEED RAM		
HD	SCREEN		PRICE
2001 1.1	9.5	100 20	1999
2002 .75	11.3	117 12	2499
2003 1	10.4	117 32	3599

MODEL	SPEED RAM		
HD	SCREEN		PRICE
2004 1.1	11.2	133 16	3499
2005 1	11.3	133 16	2599
2006 .81	12.1	120 8	1999

MODEL	SPEED RAM		
HD	SCREEN		PRICE
2007 1.35	12.1	150 16	4799
2008 1.1	12.1	120 16	2099
2009 1.1	12.1	50 16	2099

```
9 rows selected.
```

```
SQL> select * from printer;
```

MODEL	COLOR
TYPE	PRICE
3001 Inkjet	T 275
3002 Inkjet	T 269
3003 Laser	F 829

MODEL	COLOR
TYPE	PRICE
3004 Laser	F 879
3005 Inkjet	F 180
3006 Dry	T 470

MODEL	COLOR
TYPE	PRICE
3007 Dry	A 470

```
7 rows selected.
```

2)select attribute-name from tablename;

```
SQL> select maker from product;
```

```
MAKER
```

```
-----  
A  
A  
A  
B  
B  
B  
B  
C  
C  
D  
D  
D
```

```
MAKER
```

```
-----  
D  
D  
D  
D  
D  
D  
D  
E  
E  
E  
F  
G  
G
```

```
MAKER
```

```
-----  
H  
I  
J
```

```
25 rows selected.
```

```
SQL> select speed from PC;
```

```
SPEED
```

```
-----  
133  
120  
166  
166  
166  
200  
200  
180  
200  
160  
160
```

```
11 rows selected.
```

```
SQL> select speed from laptop;
```

```
SPEED
```

```
-----  
100  
117  
117  
133  
133  
120  
150  
120  
50
```

```
9 rows selected.
```

```
SQL> select color from printer;
```

```
COLOR
```

```
-----  
T  
T  
F  
F  
F  
T  
A
```

```
7 rows selected.
```

3)select attribute-name,attribute-name, from tablename;

```
SQL> select color from printer;
```

COLOR
T
T
F
F
T
A

7 rows selected.

```
SQL> select maker,type from product;
```

MAKER	TYPE
A	PC
A	PC
A	PC
B	PC
B	PC
B	PRINTER
B	PRINTER
C	PC
C	PC
D	PC
D	PC

MAKER	TYPE
D	PC
D	LAPTOP
D	LAPTOP
D	LAPTOP
D	PRINTER
D	PRINTER
E	LAPTOP
E	LAPTOP
G	LAPTOP
G	LAPTOP

MAKER	TYPE
H	PRINTER
I	PRINTER
J	PC

25 rows selected.

```
SQL> select speed,hd from PC;
```

SPEED	HD
133	1.6
120	1.6
166	2.5
166	2.5
166	2
200	3.1
200	3.2
180	2
200	2.5
160	1.2
160	1.2

```
11 rows selected.
```

```
SQL> select speed,hd from laptop;
```

SPEED	HD
100	1.1
117	.75
117	1
133	1.1
133	1
120	.81
150	1.35
120	1.1
50	1.1

```
9 rows selected.
```

```
SQL> select color,price from printer;
```

COLOR	PRICE
T	275
T	269
F	829
F	879
F	180
T	470
A	470

```
7 rows selected.
```

4)SELECT column1, column2, columnN FROM table_name WHERE atributename >,<=,LIKE,NOT value;

```
SQL> select model,price,type from printer where price>300;
MODEL                                PRICE TYPE
-----
3003                                829 Laser
3004                                879 Laser
3006                                470 Dry
3007                                470 Dry

SQL> select model,speed,hd from printer where price<1500;
select model,speed,hd from printer where price<1500
*
ERROR at line 1:
ORA-00904: "HD": invalid identifier

SQL> select model,speed,price from printer where price<1500;
select model,speed,price from printer where price<1500
*
ERROR at line 1:
ORA-00904: "SPEED": invalid identifier

SQL> select model,speed,price from laptop where price<1500;
no rows selected

SQL> select model,hd,price from laptop where price<1500;
no rows selected

SQL> select model,hd,price from laptop where price<3000;
MODEL                                HD                                PRICE
-----
2001                                1.1                                1999
2002                                .75                                2499
2005                                1                                2599
2006                                .81                                1999
2008                                1.1                                2099
2009                                1.1                                2099

6 rows selected.

SQL> select model,hd,price from PC where cd like "6%";
select model,hd,price from PC where cd like "6%"
*
ERROR at line 1:
ORA-00904: "6%": invalid identifier

SQL> select model,hd,price from PC where cd like "6x";
select model,hd,price from PC where cd like "6x"
*
ERROR at line 1:
ORA-00904: "6x": invalid identifier

SQL> select model,hd,price from PC where cd like '6%';
MODEL                                HD                                PRICE
-----
1001                                1.6                                1595
1002                                1.6                                1399
1003                                2.5                                1899

SQL>
```

5)

```
SQL> select maker,model,type from product where maker = 'A' and type = 'PC';
MAKER                                MODEL
-----
TYPE
-----
A                                1001
PC
A                                1002
PC
A                                1003
PC

SQL>
```


6)

```
SQL> select maker,model,type from product where maker = 'A' or type = 'PC' or model = '2002';
```

MAKER	MODEL	TYPE
A	1001	PC
A	1002	PC
A	1003	PC
B	1004	PC
B	1006	PC
C	1005	PC
C	1007	PC
D	1008	PC
D	1009	PC
D	1010	PC
D	2002	LAPTOP
J	1011	PC

12 rows selected.

7)

```
SQL> select * from product where type like 'P%';
```

MAKER	MODEL
A	1001
PC	
A	1002
PC	
A	1003
PC	

MAKER	MODEL
B	1004
PC	
B	1006
PC	
B	3002
PRINTER	

MAKER	MODEL
B	3004
PRINTER	
C	1005
PC	
C	1007
PC	

MAKER	MODEL
D	1008
PC	
D	1009
PC	
D	1010
PC	

MAKER	MODEL
D	3001
PRINTER	
D	3003
PRINTER	

MAKER	MODEL
D	3001
PRINTER	
D	3003
PRINTER	
H	3005
PRINTER	

MAKER	MODEL
I	3006
PRINTER	
J	1011
PC	

17 rows selected.

```
SQL>
```

8)

```
SQL> select * from laptop where price like '%99%';
```

MODEL	SPEED RAM		
HD	SCREEN		PRICE
2001 1.1	9.5	100 20	1999
2002 .75	11.3	117 12	2499
2003 1	10.4	117 32	3599
MODEL	SPEED RAM		
HD	SCREEN		PRICE
2004 1.1	11.2	133 16	3499
2005 1	11.3	133 16	2599
2006 .81	12.1	120 8	1999
MODEL	SPEED RAM		
HD	SCREEN		PRICE
2007 1.35	12.1	150 16	4799
2008 1.1	12.1	120 16	2099
2009 1.1	12.1	50 16	2099

9 rows selected.

9)

```
SQL> select * from laptop where price like '_999';
```

MODEL	SPEED RAM		
HD	SCREEN		PRICE
2001 1.1	9.5	100 20	1999
2006 .81	12.1	120 8	1999

10)

```
SQL> select * from PC where price like '_99_';
```

MODEL	SPEED RAM		
HD	CD		PRICE
1004 2.5	8X	166 32	1999
1005 2	8X	166 16	1999

11)

```
SQL> select * from printer where price like '47_';
```

MODEL	COLOR		
TYPE			PRICE
3006 Dry	T		470
3007 Dry	A		470

(a)

Find the hard disk sizes that occur in 2 or more PCs.

```
SQL> select hd from (select hd,count(*) HD_COUNT from pc group by hd) where HD_COUNT>=2;

HD
-----
1.6
2.5
1.2
2
```

(b)

Find the manufacturer of a color printer with lowest price.

```
SQL> select min(price) from printer where color = 'T';

MIN(PRICE)
-----
        269
```

(c)

Find for each speed of PC above 150 MHz, the average price

```
SQL> select avg(price) from PC where speed>15;

AUG(PRICE)
-----
      2057

SQL> _
```

iv) Create these tables with appropriate key constraints in Oracle and populate them

```
alter table product add constraint con_pk primary key (model);
alter table pc add constraint con_pc foreign key(model) references product(model);
alter table pc add constraint con_c check (cd='4X' or cd='6X' or cd='8X' or cd='12X');
alter table pc add constraint con_c check (cd in ('4X','6X','8X','12X'));
alter table pc drop constraint con_c;
alter table TN modify CN default value;
alter table product add constraint con_pk unique (model);
```

```

SQL Plus

SQL> alter table product add constraint con_pk primary key(model);
Table altered.

SQL> alter table pc add constraint con_pc foreign key(model) references product(model);
Table altered.

SQL> alter table pc add constraint con_c check(cd='4X' or cd = '6X' or cd = '8X' or cd='12X');
alter table pc add constraint con_c check(cd='4X' or cd = '6X' or cd = '8X' or cd='12X')
*
ERROR at line 1:
ORA-02293: cannot validate (16BCE0789.CON_C) - check constraint violated

SQL> alter table pc add constraint con_c check(cd='4X' or cd = '6X' or cd = '8X' or cd='10X');
Table altered.

SQL> alter table pc add constraint con_c check(cd in ('4X','6X','8X','10X'));
alter table pc add constraint con_c check(cd in ('4X','6X','8X','10X'))
*
ERROR at line 1:
ORA-00907: missing right parenthesis

SQL> alter table pc add constraint con_c check(cd in ('4X','6X','8X','10X'));
alter table pc add constraint con_c check(cd in ('4X','6X','8X','10X'))
*
ERROR at line 1:
ORA-02264: name already used by an existing constraint

SQL> alter table pc add constraint con_c check(cd in ('4X','6X','8X','10X'));

```

```

SQL> alter table pc drop constraint con_c;
Table altered.

SQL>

```

```

SQL> alter table printer modify type varchar2(50);
Table altered.

SQL> desc printer;

```

Name	Null?	Type
MODEL		VARCHAR2(30)
COLOR		VARCHAR2(30)
TYPE		VARCHAR2(50)
PRICE		NUMBER(30)

```

SQL>

```

```

SQL> alter table product add constraint con_pk unique(model);
alter table product add constraint con_pk unique(model)
*
ERROR at line 1:
ORA-02261: such unique or primary key already exists in the table

SQL> alter table product add constraint con_pk unique(model);

```

Thank You