DBMS LAB RECORD

VARSHA.S 1BM19CS179

INSURANCE DATABASE:-

Consider the Insurance database given below. The primary keys are underlined and the data types are specified.
PERSON (driver-id #: String, name: String, address: String)
CAR (Regno: String, model: String, year: int)
ACCIDENT (report-number: int, date: date, location: String)
OWNS (driver-id #: String, Regno: String)
PARTICIPATED (driver-id: String, Regno: String, report-number: int, damage-amount: int)

   i.   Create the above tables by properly specifying the primary keys and the foreign keys. ii. Enter at least five tuples for each relation.
   iii.   Demonstrate how you a.Update the damage amount for the car with a specific Regno in the accident with report number 12 to 25000. b. Add a new accident to the database.
   iv.   Find the total number of people who owned cars that involved in accidents in 2008. v. Find the number of accidents in which cars belonging to a specific model were involved.

mysql> create database Insurance; Query
OK, 1 row affected (0.19 sec)

mysql> use Insurance; Database
changed
mysql> create table Insurance.person(driver_id varchar(10),name varchar(10),address varchar(10),primary
-> key(driver_id));
Query OK, 0 rows affected (1.02 sec)

mysql> desc Insurance.person;
```
+-----------+-------------+------+-----+---------+-------+
| Field     | Type        | Null | Key | Default | Extra |
+-----------+-------------+------+-----+---------+-------+
| driver_id | varchar(10) | NO   | PRI | NULL    |       |
| name      | varchar(10) | YES  |     | NULL    |       |
| address   | varchar(10) | YES  |     | NULL    |       |
+-----------+-------------+------+-----+---------+-------+
```

```
mysql> insert into Insurance.person values('&driver_id','&name','&address'); Query
OK, 1 row affected (0.09 sec)

mysql> insert into Insurance.person values('A01','MSD','Banglore');
Query OK, 1 row affected (0.10 sec)

mysql> insert into Insurance.person values('A02','VK','CHENNAI');
Query OK, 1 row affected (0.10 sec)

mysql> insert into Insurance.person values('A03','RS','KERALA');
Query OK, 1 row affected (0.14 sec)

mysql> insert into Insurance.person values('A04','SR','UP');
Query OK, 1 row affected (0.06 sec)

mysql> insert into Insurance.person values('A05','KP','ENG');
Query OK, 1 row affected (0.09 sec)

mysql> commit;
Query OK, 0 rows affected (0.00 sec)

mysql> select * from Insurance.person;
```

```
+-----------+-------+----------+ |
driver_id | name | address |
+-----------+-------+----------+
| &driver_id | &name | &address |
| A01       | MSD   | Banglore |
| A02       | VK    | CHENNAI  |
| A03       | RS    | KERALA   |
| A04       | SR    | UP       |
| A05       | KP    | ENG      |
+-----------+-------+----------+

mysql>
mysql> create table Insurance.car(regno varchar(10),model varchar(10),year int,primary key(regno)); Query
OK, 0 rows affected (0.36 sec)

mysql> desc Insurance.car;
+-------+-------------+------+-----+---------+-------+
| Field | Type        | Null | Key | Default | Extra |
+-------+-------------+------+-----+---------+-------+
| regno | varchar(10) | NO   | PRI | NULL    |       |
| model | varchar(10) | YES  |     | NULL    |       |
```

| year | int | YES | | NULL | |
+-------+-------------+------+-----+---------+-------+
3 rows in set (0.00 sec)

mysql> insert into Insurance.car values('&reg_num','&model','1');
Query OK, 1 row affected (0.05 sec)

mysql> insert into Insurance.car values('KA031181','Lancer', 1957);
Query OK, 1 row affected (0.08 sec)

mysql> insert into Insurance.car values('KA095477','TOYOTA', 1998);
Query OK, 1 row affected (0.11 sec)

mysql> insert into Insurance.car values('KA052250','INDICA', 1990);
Query OK, 1 row affected (0.17 sec)

mysql> insert into Insurance.car values('KA053408','HONDA', 2008);
Query OK, 1 row affected (0.15 sec)

mysql> insert into Insurance.car values('KA041702','AUDI', 2005);
Query OK, 1 row affected (0.07 sec)

mysql> commit;
Query OK, 0 rows affected (0.00 sec)

mysql> select * from Insurance.car;

+----------+--------+------+
| regno | model | year |
+----------+--------+------+
&reg_num	&model	1
KA031181	Lancer	1957
KA041702	AUDI	2005
KA052250	INDICA	1990
KA053408	HONDA	2008
KA095477	TOYOTA	1998
+----------+--------+------+
6 rows in set (0.00 sec)

mysql>
mysql> create table Insurance.accident(report_number int,accident_date date,location varchar(15),primary
-> key(report_number));
Query OK, 0 rows affected (0.38 sec)

```
mysql> desc Insurance.accident;
+---------------+-------------+------+-----+---------+-------+
| Field         | Type        | Null | Key | Default | Extra |
+---------------+-------------+------+-----+---------+-------+
| report_number | int         | NO   | PRI | NULL    |       |
| accident_date | date        | YES  |     | NULL    |       |
| location      | varchar(15) | YES  |     | NULL    |       |
+---------------+-------------+------+-----+---------+-------+
3 rows in set (0.00 sec)

mysql> insert into Insurance.accident values('11', STR_TO_DATE('01-01-2003', '%m-%d-
%Y'),'MysoreRoad');
Query OK, 1 row affected (0.07 sec)

mysql> insert into Insurance.accident values('12', STR_TO_DATE('02-02-2004', '%m-%d-%Y'),'Southend');
Query OK, 1 row affected (0.24 sec)

mysql> insert into Insurance.accident values('13', STR_TO_DATE('06-01-2003', '%m-
%d%Y'),'Bulltemple');
Query OK, 1 row affected (0.10 sec)

mysql> insert into Insurance.accident values('14', STR_TO_DATE('05-02-2008', '%m-%d-%Y'),'Mysore');
Query OK, 1 row affected (0.04 sec)

mysql> insert into Insurance.accident values('15', STR_TO_DATE('04-03-2005', '%m-
%d%Y'),'Kanakpura');
Query OK, 1 row affected (0.05 sec)

mysql> commit;
Query OK, 0 rows affected (0.00 sec)

mysql> select * from Insurance.accident;


+---------------+---------------+------------+
| report_number | accident_date | location   |
+---------------+---------------+------------+
|            11 | 2003-01-01    | MysoreRoad |
|            12 | 2004-02-02    | Southend   |
|            13 | 2003-06-01    | Bulltemple |
|            14 | 2008-05-02    | Mysore     |
|            15 | 2005-04-03    | Kanakpura  |
+---------------+---------------+------------+
5 rows in set (0.00 sec)

mysql>
mysql> create table Insurance.owns(driver_id varchar(10),regno varchar(10),primary
   -> key(driver_id,regno),foreign key(driver_id) references person(driver_id),foreign key(regno)
-> references car(regno));
```

Query OK, 0 rows affected (0.42 sec)

mysql> desc Insurance.owns;
```
+-----------+-------------+------+-----+---------+-------+
| Field     | Type        | Null | Key | Default | Extra |
+-----------+-------------+------+-----+---------+-------+
| driver_id | varchar(10) | NO   | PRI | NULL    |       |
| regno     | varchar(10) | NO   | PRI | NULL    |       |
+-----------+-------------+------+-----+---------+-------+
```
2 rows in set (0.00 sec)

mysql> insert into Insurance.owns values ('&driver_id','&reg_num');
Query OK, 1 row affected (0.10 sec)

mysql> insert into Insurance.owns values ('A01','KA052250');
Query OK, 1 row affected (0.31 sec)

mysql> insert into Insurance.owns values ('A02','KA053408');
Query OK, 1 row affected (0.11 sec)
mysql> insert into Insurance.owns values ('A04','KA031181');
Query OK, 1 row affected (0.04 sec)

mysql> insert into Insurance.owns values ('A03','KA095477');
Query OK, 1 row affected (0.04 sec)

mysql> insert into Insurance.owns values ('A05','KA041702');
Query OK, 1 row affected (0.04 sec)

mysql> commit;
Query OK, 0 rows affected (0.00 sec)

mysql> select * from Insurance.owns;

```
+-----------+----------+
| driver_id | regno    |
+-----------+----------+
| &driver_id | &reg_num |
| A04       | KA031181 |
| A05       | KA041702 |
| A01       | KA052250 |
| A02       | KA053408 |
| A03       | KA095477 |
+-----------+----------+
```
6 rows in set (0.00 sec)

mysql>

```
mysql> create table Insurance.participated(driver_id varchar(10),regno varchar(10),report_number
-> int,damage_amount int,primary key(driver_id,regno,report_number),foreign key(driver_id)
    -> references person(driver_id),foreign key(regno) references car(regno),foreign key(report_number)
    -> references accident(report_number));
Query OK, 0 rows affected (0.89 sec)

mysql> desc Insurance.participated;
+---------------+-------------+------+-----+---------+-------+
| Field         | Type        | Null | Key | Default | Extra |
+---------------+-------------+------+-----+---------+-------+
| driver_id     | varchar(10) | NO   | PRI | NULL    |       |
| regno         | varchar(10) | NO   | PRI | NULL    |       |
| report_number | int         | NO   | PRI | NULL    |       |
| damage_amount | int         | YES  |     | NULL    |       |
+---------------+-------------+------+-----+---------+-------+
4 rows in set (0.00 sec)

mysql> insert into Insurance.participated values('A01','KA052250',11,10000); Query
OK, 1 row affected (0.05 sec)

mysql> insert into Insurance.participated values('A02','KA053408',12,50000); Query
OK, 1 row affected (0.11 sec)
mysql> insert into Insurance.participated values('A03' , 'KA095477' , '13' , '25000'); Query
OK, 1 row affected (0.06 sec)

mysql> insert into Insurance.participated values('A04', 'KA031181', '14' , '3000');
Query OK, 1 row affected (0.12 sec)

mysql> insert into Insurance.participated values('A05', 'KA041702', '15','5000');
Query OK, 1 row affected (0.10 sec)

mysql> select * from Insurance.participated;
+-----------+----------+---------------+---------------+
| driver_id | regno    | report_number | damage_amount |
+-----------+----------+---------------+---------------+
| A01       | KA052250 |            11 |         10000 |
| A02       | KA053408 |            12 |         50000 |
| A03       | KA095477 |            13 |         25000 |
| A04       | KA031181 |            14 |          3000 |
| A05       | KA041702 |            15 |          5000 |
+-----------+----------+---------------+---------------+
5 rows in set (0.00 sec)

mysql>
mysql> update Insurance.participated
    -> set damage_amount=25000
    -> where report_number=12 and regno='A02';
Query OK, 0 rows affected (0.00 sec)
Rows matched: 0  Changed: 0  Warnings: 0
```

mysql>
mysql> insert into Insurance.accident values('16', '2007-03-21','MysoreRoad');
Query OK, 1 row affected (0.08 sec)

mysql> insert into Insurance.participated values('A05', 'KA041702','16','5000');
Query OK, 1 row affected (0.20 sec)

mysql>
mysql> select count(distinct o.driver_id) as People from Insurance.owns o,Insurance.participated
    -> p,Insurance.accident a where a.accidentd_date like
    -> '2008%' and o.regno=p.regno and p.report_number=a.report_number;

mysql> use Insurance; Database
changed
mysql> select count(*) as Totalcars from car c,participated p where c.regno=p.regno and
c.model='TOYOTA';
+-----------+
| Totalcars |
+-----------+
| 1 |
+-----------+
1 row in set (0.00 sec)

BANKING ENTERPRISE DATABASE

Consider the following database for a banking enterprise.
BRANCH (branch-name: String, branch-city: String, assets: real)
ACCOUNTS (accno: int, branch-name: String, balance: real)
DEPOSITOR (customer-name: String, customer-street: String, customer-city: String)
LOAN (loan-number: int, branch-name: String, amount: real)
BORROWER (customer-name: String, loan-number: int)
  i.   **Create the above tables by properly specifying the primary keys and the foreign keys.**
  ii.   **Enter at least five tuples for each relation. iii.   Find all the customers who have at least two accounts at the Main branch.**
    iv.   **Find all the customers who have an account at all the branches located in a specific city.**
  v.   **Demonstrate how you delete all account tuples at every branch located in a specific city.**

mysql> create database banking;
ERROR 1007 (HY000): Can't create database 'banking'; database exists
mysql> use banking; Database changed
mysql> create table BRANCH(branch_name varchar(20),branch_city varchar(10),assets real,primary
-> key(branch_name));
Query OK, 0 rows affected (1.31 sec)

mysql> insert into BRANCH values('SBI_Chamrajpet','Bangalore',50000); Query
OK, 1 row affected (0.06 sec)

mysql> insert into BRANCH values('SBI_Residency road','Bangalore',10000); Query
OK, 1 row affected (0.09 sec)

mysql> insert into BRANCH values('SBI_shivajiroad','Bombay',20000);
Query OK, 1 row affected (0.07 sec)

mysql> insert into BRANCH values('SBI_parlimentroad','Delhi',10000);
Query OK, 1 row affected (0.08 sec)

mysql> insert into BRANCH values('SBI_jantarmantar','Delhi',20000);
Query OK, 1 row affected (0.05 sec)

mysql> commit;
Query OK, 0 rows affected (0.00 sec)

mysql> select * from BRANCH;

```
+-------------------+-------------+--------+
| branch_name       | branch_city | assets |
+-------------------+-------------+--------+
| SBI_Chamrajpet    | Bangalore   |  50000 |
| SBI_jantarmantar  | Delhi       |  20000 |
| SBI_parlimentroad | Delhi       |  10000 |
| SBI_Residency road | Bangalore  |  10000 |
| SBI_shivajiroad   | Bombay      |  20000 |
+-------------------+-------------+--------+
5 rows in set (0.00 sec)
```

mysql> create table ACCOUNTS(accno integer,branch_name varchar(20),balance real,primary
   -> key(accno),foreign key(branch_name) references BRANCH(branch_name));
Query OK, 0 rows affected (0.52 sec)

mysql> insert into ACCOUNTS values('1','SBI_Chamrajpet','2000');
Query OK, 1 row affected (0.07 sec)

mysql> insert into ACCOUNTS values('2','SBI_Residency road','5000');
Query OK, 1 row affected (0.05 sec)

mysql> insert into ACCOUNTS values('3','SBI_shivajiroad','6000');
Query OK, 1 row affected (0.05 sec)

mysql> insert into ACCOUNTS values('4','SBI_parlimentroad','9000');
Query OK, 1 row affected (0.05 sec)

mysql> insert into ACCOUNTS values('5','SBI_jantarmantar','8000');
Query OK, 1 row affected (0.09 sec)

mysql> insert into ACCOUNTS values('6','SBI_shivajiroad','4000');
Query OK, 1 row affected (0.21 sec)

mysql> insert into ACCOUNTS values('8','SBI_Residency road','4000');
Query OK, 1 row affected (0.17 sec)

mysql> insert into ACCOUNTS values('9','SBI_parlimentroad','3000');
Query OK, 1 row affected (0.09 sec)

mysql> insert into ACCOUNTS values('10','SBI_Residency road','5000');
Query OK, 1 row affected (0.05 sec)

mysql> insert into ACCOUNTS values('11','SBI_jantarmantar','2000');
Query OK, 1 row affected (0.16 sec)

mysql> commit;
Query OK, 0 rows affected (0.00 sec)

mysql> select * from ACCOUNTS;


```
+-------+-------------------+---------+
| accno | branch_name       | balance |
+-------+-------------------+---------+
|     1 | SBI_Chamrajpet    |    2000 |
|     2 | SBI_Residency road |   5000 |
|     3 | SBI_shivajiroad   |    6000 |
|     4 | SBI_parlimentroad |    9000 |
|     5 | SBI_jantarmantar  |    8000 |
|     6 | SBI_shivajiroad   |    4000 |
|     8 | SBI_Residency road |   4000 |
|     9 | SBI_parlimentroad |    3000 |
|    10 | SBI_Residency road |   5000 |
|    11 | SBI_jantarmantar  |    2000 |
+-------+-------------------+---------+
```
10 rows in set (0.00 sec)

mysql>
mysql> create table BANKCUST(customername varchar(20),customerstreet varchar(30),customercity
    -> varchar(30),primary key(customername));
Query OK, 0 rows affected (0.59 sec)

mysql> insert into BANKCUST values('AVINASH','Bulltemple','Bangalore'); Query
OK, 1 row affected (0.19 sec)

```
mysql> insert into BANKCUST values('dinesh','banerghata','Bangalore');
Query OK, 1 row affected (0.13 sec)

mysql> insert into BANKCUST values('mohan','mgroad','Bangalore');
Query OK, 1 row affected (0.06 sec)

mysql> insert into BANKCUST values('nikhil','churchstreeet','Delhi');
Query OK, 1 row affected (0.05 sec)

mysql> insert into BANKCUST values('ravi','akbarroad','Delhi');
Query OK, 1 row affected (0.09 sec)

mysql> commit;
Query OK, 0 rows affected (0.00 sec)

mysql> select * from BANKCUST;
+--------------+---------------+--------------+
| customername | customerstreet | customercity |
+--------------+---------------+--------------+
| AVINASH      | Bulltemple    | Bangalore    |
| dinesh       | banerghata    | Bangalore    |
| mohan        | mgroad        | Bangalore    |
| nikhil       | churchstreeet | Delhi        |
| ravi         | akbarroad     | Delhi        |
+--------------+---------------+--------------+
5 rows in set (0.00 sec)

mysql> create table DEPOSIT(customername varchar(20),accno integer,primary     ->
key(accno,customername),foreign key(accno) references ACCOUNTS(accno),foreign    ->
key(customername) references BANKCUST(customername));
Query OK, 0 rows affected (0.74 sec)

mysql> insert into DEPOSIT values('AVINASH',1);
Query OK, 1 row affected (0.04 sec)

mysql> insert into DEPOSIT values('dinesh',2);
Query OK, 1 row affected (0.09 sec)

mysql> insert into DEPOSIT values('nikhil',4);
Query OK, 1 row affected (0.05 sec)

mysql> insert into DEPOSIT values('ravi',5);
Query OK, 1 row affected (0.09 sec)

mysql> insert into DEPOSIT values('AVINASH',8);
Query OK, 1 row affected (0.23 sec)

mysql> insert into DEPOSIT values('nikhil',9);
Query OK, 1 row affected (0.15 sec)
```

```
mysql> insert into DEPOSIT values('dinesh',10);
Query OK, 1 row affected (0.07 sec)

mysql> insert into DEPOSIT values('nikhil',11);
Query OK, 1 row affected (0.04 sec)

mysql> commit;
Query OK, 0 rows affected (0.00 sec)

mysql> select * from DEPOSIT;
+--------------+-------+
| customername | accno |
+--------------+-------+
| AVINASH      |    1 |
| AVINASH      |    8 |
| dinesh       |    2 |
| dinesh       |   10 |
| nikhil       |    4 |
| nikhil       |    9 |
| nikhil       |   11 |
| ravi         |    5 |
+--------------+-------+
8 rows in set (0.00 sec)

mysql> CREATE TABLE LOAN(loanno int,branch_name varchar(20),amt real,primary key(loanno),foreign
    -> key(branch_name) references BRANCH(branch_name));
Query OK, 0 rows affected (0.51 sec)

mysql> insert into LOAN values(1,'SBI_Chamrajpet',1000);
Query OK, 1 row affected (0.24 sec)

mysql> insert into LOAN values(2,'SBI_Residency road',2000);
Query OK, 1 row affected (0.21 sec)

mysql> insert into LOAN values(3,'SBI_shivajiroad',3000);
Query OK, 1 row affected (0.15 sec)

mysql> insert into LOAN values(4,'SBI_parlimentroad',4000);
Query OK, 1 row affected (0.04 sec)

mysql> insert into LOAN values(5,'SBI_jantarmantar',5000);
Query OK, 1 row affected (0.10 sec)

mysql> commit;
Query OK, 0 rows affected (0.00 sec)

mysql> select * from LOAN;
+--------+--------------------+------+
```

```
| loanno | branch_name        | amt  |
+--------+-------------------+------+
|      1 | SBI_Chamrajpet    | 1000 |
|      2 | SBI_Residency road | 2000 |
|      3 | SBI_shivajiroad   | 3000 |
|      4 | SBI_parlimentroad  | 4000 |
|      5 | SBI_jantarmantar  | 5000 |
+--------+-------------------+------+
5 rows in set (0.00 sec)

mysql>
mysql> select customername from DEPOSIT d,ACCOUNTS a
    -> where d.accno=a.accno
    -> group by customername
    -> having count(d.customername) >=2;
+--------------+
| customername |
+--------------+
| AVINASH      |
| dinesh       |
| nikhil       |
+--------------+
3 rows in set (0.00 sec)

mysql>
mysql> select d.customername from DEPOSIT d,BRANCH b,ACCOUNTS a
    -> where b.branch_name=a.branch_name
    -> AND a.accno=d.accno
    -> and branch_city='Delhi'
    -> group by d.customername
    -> HAVING COUNT(distinct b.branch_name)=(
    ->  SELECT COUNT(branch_name)
    ->  FROM branch
    ->  WHERE branch_city='Delhi');




+--------------+
| customername |
+--------------+
| nikhil       |
+--------------+
1 row in set (0.00 sec)

mysql>
mysql> delete from ACCOUNTS
    -> where branch_name IN(SELECT branch_name FROM branch WHERE branch_city='Bombay'); Query
OK, 2 rows affected (0.11 sec)
```

mysql> Select * from ACCOUNTS;

```
+-------+-------------------+---------+
| accno | branch_name       | balance |
+-------+-------------------+---------+
|     1 | SBI_Chamrajpet    |    2000 |
|     2 | SBI_Residency road|    5000 |
|     4 | SBI_parlimentroad |    9000 |
|     5 | SBI_jantarmantar  |    8000 |
|     8 | SBI_Residency road|    4000 |
|     9 | SBI_parlimentroad |    3000 |
|    10 | SBI_Residency road|    5000 |
|    11 | SBI_jantarmantar  |    2000 |
+-------+-------------------+---------+
```

SUPPLIER DATABASE:-

Consider the following schema:
SUPPLIERS (sid: integer, sname: string, address: string)
PARTS (pid: integer, pname: string, color: string)
CATALOG (sid: integer, pid: integer, cost: real)
The Catalog relation lists the prices charged for parts by Suppliers.Write the following queries in SQL:
   i.   Find the pnames of parts for which there is some supplier.
   ii.   Find the snames of suppliers who supply every part. iii.   Find the snames of suppliers who supply every red part. iv.   Find the pnames of parts supplied by Acme Widget Suppliers and by no one else.

> v. **Find the sids of suppliers who charge more for some part than the average cost of that part (averaged over all the suppliers who supply that part).**
> vi. **For each part, find the sname of the supplier who charges the most for that part. vii. Find the sids of suppliers who supply only red parts**

mysql> create database SUPPLIER; Query
OK, 1 row affected (0.21 sec)

mysql> use SUPPLIER; Database
changed
mysql> create table SUPPLIERS(sid BIGINT(5) primary key, sname
   -> varchar(20), city varchar(20));
Query OK, 0 rows affected, 1 warning (0.90 sec)

mysql> insert into SUPPLIERS values(10001,'Acme Widget','Bangalore'); Query
OK, 1 row affected (0.30 sec)

mysql> insert into SUPPLIERS values(10002,'Johns ','Kolkata');
Query OK, 1 row affected (0.25 sec)

mysql> insert into SUPPLIERS values(10003,'Vimal','Mumbai');
Query OK, 1 row affected (0.12 sec)

mysql> insert into SUPPLIERS values(10004,'Reliance ','Delhi');
Query OK, 1 row affected (0.24 sec)

mysql> select * from SUPPLIERS;
+-------+-------------+-----------+
| sid | sname | city |
+-------+-------------+-----------+
10001	Acme Widget	Bangalore
10002	Johns	Kolkata
10003	Vimal	Mumbai
10004	Reliance	Delhi
+-------+-------------+-----------+
4 rows in set (0.00 sec)

mysql>
mysql> create table PARTS(pid BIGINT(5) primary key, pname varchar(20),
   -> color varchar(10));
Query OK, 0 rows affected, 1 warning (0.57 sec)

mysql> insert into PARTS values(20001,'Book','RED');
Query OK, 1 row affected (0.04 sec)

mysql> insert into PARTS values(20002,'Pen','RED');
Query OK, 1 row affected (0.07 sec)

mysql> insert into PARTS values(20003,'Pencil','Green');
Query OK, 1 row affected (0.05 sec)

mysql> insert into PARTS values(20004,'Mobile ','Green');
Query OK, 1 row affected (0.07 sec)

mysql> insert into PARTS values(20005,'Charger','Black');
Query OK, 1 row affected (0.04 sec)

mysql> select * from PARTS;
+-------+---------+-------+
| pid | pname | color |
+-------+---------+-------+
20001	Book	RED
20002	Pen	RED
20003	Pencil	Green
20004	Mobile	Green	
20005 | Charger | Black |
+-------+---------+-------+
5 rows in set (0.00 sec)

mysql> mysql> create table CATALOG(sid BIGINT(5), pid BIGINT(5), foreign
key(sid)
    -> references SUPPLIERS(sid), foreign key(pid) references PARTS(pid),
    -> cost float(6), primary key(sid, pid));
Query OK, 0 rows affected, 2 warnings (0.90 sec)

mysql> insert into CATALOG values(10001,20001,10);
Query OK, 1 row affected (0.04 sec)

mysql> insert into CATALOG values(10001,20002,10);
Query OK, 1 row affected (0.14 sec)

mysql> insert into CATALOG values(10001,20003,30);
Query OK, 1 row affected (0.11 sec)

mysql> insert into CATALOG values(10001,20004,10);
Query OK, 1 row affected (0.22 sec)

mysql> insert into CATALOG values(10001,20005,10);
Query OK, 1 row affected (0.04 sec)

mysql> insert into CATALOG values(10002,20001,10);
Query OK, 1 row affected (0.16 sec)

mysql> insert into CATALOG values(10002,20002,20);
Query OK, 1 row affected (0.09 sec)

mysql> insert into CATALOG values(10003,20003,30);

Query OK, 1 row affected (0.07 sec)

mysql> insert into CATALOG values(10004,20003,40);
Query OK, 1 row affected (0.04 sec)

mysql> select * from CATALOG;
+-------+-------+------+
| sid | pid | cost |
+-------+-------+------+
10001	20001	10
10001	20002	10
10001	20003	30
10001	20004	10
10001	20005	10
10002	20001	10
10002	20002	20
10003	20003	30
10004	20003	40
+-------+-------+------+
9 rows in set (0.00 sec)

mysql>
mysql> SELECT DISTINCT P.pname
    -> FROM Parts P, Catalog C
    -> WHERE P.pid = C.pid;
+---------+
| pname |
+---------+
| Book |
| Pen |
| Pencil |
| Mobile |
| Charger |
+---------+
5 rows in set (0.00 sec)

mysql> mysql> select S.sname from SUPPLIERS S where not exists (select
P.pid from   -> PARTS P where not exists (select C.sid from CATALOG C
where C.sid =
    -> S.sid and C.pid = P.pid));

+-------------+
| sname |
+-------------+
| Acme Widget |
+-------------+
1 row in set (0.00 sec)

mysql>

```
mysql> select S.sname from SUPPLIERS S where not exists (select P.pid from
    -> PARTS P where P.color = 'Red' and (not exists (select C.sid from
    -> CATALOG C where C.sid = S.sid and C.pid = P.pid)));
+-------------+
| sname       |
+-------------+
| Acme Widget |
| Johns       |
+-------------+
2 rows in set (0.00 sec)

mysql> mysql>
mysql> select P.pname from PARTS P, CATALOG C, SUPPLIERS S where P.pid
    -> = C.pid and C.sid = S.sid and S.sname = 'Acme Widget' and not exists
    -> (select * from CATALOG C1, SUPPLIERS S1 where P.pid = C1.pid and
    -> C1.sid = S1.sid and S1.sname <> 'Acme Widget');
+---------+
| pname   |
+---------+
| Mobile  |
| Charger |
+---------+
2 rows in set (0.00 sec)

mysql> mysql> mysql> SELECT DISTINCT C.sid
FROM Catalog C
    -> WHERE C.cost > ( SELECT AVG (C1.cost)
    -> FROM Catalog C1
    -> WHERE C1.pid = C.pid );
+-------+
| sid   |
+-------+
| 10002 |
| 10004 |
+-------+
2 rows in set (0.00 sec)

mysql> mysql> mysql>
SELECT P.pid, S.sname
    -> FROM Parts P, Suppliers S, Catalog C
    -> WHERE C.pid = P.pid
    -> AND C.sid = S.sid
    -> AND C.cost = (SELECT MAX(C1.cost)
    -> FROM Catalog C1
    -> WHERE C1.pid = P.pid);
```

```
+-------+-------------+
| pid   | sname       |
+-------+-------------+
| 20001 | Johns       |
| 20001 | Acme Widget |
| 20002 | Johns       |
| 20003 | Reliance    |
| 20004 | Acme Widget |
| 20005 | Acme Widget |
+-------+-------------+
```

STUDENT-FACULTY DATABASE:-

Consider the following database for student enrolment for course:
STUDENT (snum: integer, sname: string, major: string, level: string, age: integer)
CLASS (name: string, meets at: time, room: string, fid: integer)
ENROLLED (snum: integer, cname: string)
FACULTY (fid: integer, fname: string, deptid: integer)

The meaning of these relations is straightforward; for example, Enrolled has one record per student-class pair such that the student is enrolled in the class. Level is a two character code with 4 different values (example: Junior: JR etc)

Write the following queries in SQL. No duplicates should be printed in any of the answers.
  i.   Find the names of all Juniors (level = JR) who are enrolled in a class taught by ii.
       Find the names of all classes that either meet in room R128 or have five or more
  Students enrolled.
  iii. Find the names of all students who are enrolled in two classes that meet at the same
  time. iv.   Find the names of faculty members who teach in every room in which some
  class is taught.
  v.   Find the names of faculty members for whom the combined enrolment of the courses
       that they teach is less than five. vi. Find the names of students who are not enrolled in
       any class. vii. For each age value that appears in Students, find the level value that
       appears most often. For example, if there are more FR level students aged 18 than SR,
       JR, or SO students aged 18, you should print the pair (18, FR).

mysql> CREATE DATABASE student_faculty;
Query OK, 1 row affected (0.15 sec)

mysql> USE student_faculty; Database
changed
mysql> CREATE TABLE student(
    -> snum INT,
    -> sname VARCHAR(10),
    -> major VARCHAR(2),
    -> lvl VARCHAR(2),

```
    -> age INT, primary key(snum));
Query OK, 0 rows affected (0.43 sec)

mysql> mysql> CREATE TABLE
faculty(    -> fid INT,fname
VARCHAR(20),
    -> deptid INT,
    ->  PRIMARY KEY(fid));
Query OK, 0 rows affected (1.15 sec)

mysql> mysql> CREATE
TABLE class(    -> cname
VARCHAR(20),
    -> metts_at TIMESTAMP,
    -> room VARCHAR(10),
    ->  fid INT,
    -> PRIMARY KEY(cname),
    -> FOREIGN KEY(fid) REFERENCES faculty(fid));
Query OK, 0 rows affected (0.47 sec)

mysql>
mysql> CREATE TABLE enrolled(
    -> snum INT,
    -> cname VARCHAR(20),
    -> PRIMARY KEY(snum,cname),
    -> FOREIGN KEY(snum) REFERENCES student(snum),
    -> FOREIGN KEY(cname) REFERENCES class(cname));
Query OK, 0 rows affected (0.59 sec)

mysql>
mysql> INSERT INTO STUDENT VALUES(1, 'jhon', 'CS', 'Sr', 19);
Query OK, 1 row affected (0.18 sec)

mysql> INSERT INTO STUDENT VALUES(2, 'Smith', 'CS', 'Jr', 20);
Query OK, 1 row affected (0.10 sec)

mysql> INSERT INTO STUDENT VALUES(3 , 'Jacob', 'CV', 'Sr', 20);
Query OK, 1 row affected (0.06 sec)

mysql> INSERT INTO STUDENT VALUES(4, 'Tom ', 'CS', 'Jr', 20);
Query OK, 1 row affected (0.09 sec)

mysql> INSERT INTO STUDENT VALUES(5, 'Rahul', 'CS', 'Jr', 20);
Query OK, 1 row affected (0.16 sec)

mysql> INSERT INTO STUDENT VALUES(6, 'Rita', 'CS', 'Sr', 21);
Query OK, 1 row affected (0.11 sec)

mysql> select * from STUDENT;
```

```
+------+-------+-------+------+------+
| snum | sname | major | lvl  | age  |
+------+-------+-------+------+------+
|    1 | jhon  | CS    | Sr   |   19 |
|    2 | Smith | CS    | Jr   |   20 |
|    3 | Jacob | CV    | Sr   |   20 |
|    4 | Tom   | CS    | Jr   |   20 |
|    5 | Rahul | CS    | Jr   |   20 |
|    6 | Rita  | CS    | Sr   |   21 |
+------+-------+-------+------+------+
6 rows in set (0.00 sec)

mysql>
mysql> INSERT INTO FACULTY VALUES(11, 'Harish', 1000);
Query OK, 1 row affected (0.06 sec)

mysql> INSERT INTO FACULTY VALUES(12, 'MV', 1000);
Query OK, 1 row affected (0.22 sec)

mysql> INSERT INTO FACULTY VALUES(13 , 'Mira', 1001);
Query OK, 1 row affected (0.23 sec)

mysql> INSERT INTO FACULTY VALUES(14, 'Shiva', 1002);
Query OK, 1 row affected (0.11 sec)

mysql> INSERT INTO FACULTY VALUES(15, 'Nupur', 1000);
Query OK, 1 row affected (0.07 sec)

mysql> select * from FACULTY;
+-----+--------+--------+
| fid | fname  | deptid |
+-----+--------+--------+
|  11 | Harish |   1000 |
|  12 | MV     |   1000 |
|  13 | Mira   |   1001 |
|  14 | Shiva  |   1002 |
|  15 | Nupur  |   1000 |
+-----+--------+--------+
5 rows in set (0.00 sec)

mysql>
mysql> insert into class values('class1', '12/11/15 10:15:16', 'R1', 14);
Query OK, 1 row affected (0.06 sec)
```

```
mysql> insert into class values('class10', '12/11/15 10:15:16', 'R128', 14);
Query OK, 1 row affected (0.15 sec)

mysql> insert into class values('class2', '12/11/15 10:15:20', 'R2', 12);
Query OK, 1 row affected (0.06 sec)

mysql> insert into class values('class3', '12/11/15 10:15:25', 'R3', 11);
Query OK, 1 row affected (0.05 sec)

mysql> insert into class values('class4', '12/11/15 20:15:20', 'R4', 14);
Query OK, 1 row affected (0.06 sec)

mysql> insert into class values('class5', '12/11/15 20:15:20', 'R3', 15);
Query OK, 1 row affected (0.29 sec)

mysql> insert into class values('class6', '12/11/15 13:20:20', 'R2', 14);
Query OK, 1 row affected (0.08 sec)

mysql> insert into class values('class7', '12/11/15 10:10:10', 'R3', 14);
Query OK, 1 row affected (0.05 sec)

mysql> select * from class;
+---------+---------------------+------+------+
| cname   | metts_at            | room | fid  |
+---------+---------------------+------+------+
| class1  | 2012-11-15 10:15:16 | R1   |   14 |
| class10 | 2012-11-15 10:15:16 | R128 |   14 |
| class2  | 2012-11-15 10:15:20 | R2   |   12 |
| class3  | 2012-11-15 10:15:25 | R3   |   11 |
| class4  | 2012-11-15 20:15:20 | R4   |   14 |
| class5  | 2012-11-15 20:15:20 | R3   |   15 |
| class6  | 2012-11-15 13:20:20 | R2   |   14 |
| class7  | 2012-11-15 10:10:10 | R3   |   14 |
+---------+---------------------+------+------+
8 rows in set (0.00 sec)

mysql>
mysql> insert into enrolled values(1, 'class1');
Query OK, 1 row affected (0.05 sec)

mysql> insert into enrolled values(2, 'class1');
Query OK, 1 row affected (0.06 sec)

mysql> insert into enrolled values(3, 'class3');
Query OK, 1 row affected (0.08 sec)

mysql> insert into enrolled values(4, 'class3');
Query OK, 1 row affected (0.07 sec)
```

```
mysql> insert into enrolled values(5, 'class4');
Query OK, 1 row affected (0.07 sec)

mysql> insert into enrolled values(1, 'class5');
Query OK, 1 row affected (0.05 sec)

mysql> insert into enrolled values(2, 'class5');
Query OK, 1 row affected (0.06 sec)

mysql> insert into enrolled values(3, 'class5');
Query OK, 1 row affected (0.06 sec)

mysql> insert into enrolled values(4, 'class5');
Query OK, 1 row affected (0.21 sec)

mysql> insert into enrolled values(5, 'class5');
Query OK, 1 row affected (0.17 sec)

mysql> select * from enrolled;
+------+--------+
| snum | cname  |
+------+--------+
|    1 | class1 |
|    2 | class1 |
|    3 | class3 |
|    4 | class3 |
|    5 | class4 |
|    1 | class5 |
|    2 | class5 |
|    3 | class5 |
|    4 | class5 |
|    5 | class5 |
+------+--------+
10 rows in set (0.00 sec)

mysql>
mysql> SELECT DISTINCT S.Sname
    -> FROM Student S, Class C, Enrolled E, Faculty F
    -> WHERE S.snum = E.snum AND E.cname = C.cname AND C.fid = F.fid AND
    -> F.fname = 'Harish' AND S.lvl = 'Jr';


+-------+
| Sname |
+-------+
| Tom   |
+-------+
1 row in set (0.00 sec)
```

```
mysql>
mysql> SELECT DISTINCT cname
    -> FROM class
    -> WHERE room='room128'
    -> OR
    -> cname IN (SELECT e.cname FROM enrolled e GROUP BY e.cname HAVING COUNT(*)>=5);
+--------+
| cname  |
+--------+
| class5 |
+--------+
1 row in set (0.00 sec)

mysql> mysql>
mysql> SELECT DISTINCT S.sname
    -> FROM Student S
    -> WHERE S.snum IN (SELECT E1.snum
    -> FROM Enrolled E1, Enrolled E2, Class C1, Class C2
    -> WHERE E1.snum = E2.snum AND E1.cname <> E2.cname
    -> AND E1.cname = C1.cname
    -> AND E2.cname = C2.cname AND C1.metts_at = C2.metts_at);
+-------+ |
sname |
+-------+
| Rahul |
+-------+
1 row in set (0.00 sec)

mysql> mysql>
mysql> SELECT f.fname,f.fid
    -> FROM faculty f
    -> WHERE f.fid in ( SELECT fid FROM class
    -> GROUP BY fid HAVING COUNT(*)=(SELECT COUNT(DISTINCT room) FROM class) );
+-------+-----+
| fname | fid |
+-------+-----+
| Shiva |  14 |
+-------+-----+
1 row in set (0.00 sec)

mysql> mysql>
mysql> SELECT DISTINCT F.fname
    -> FROM Faculty F
    -> WHERE 5 > (SELECT COUNT(E.snum)
    -> FROM Class C, Enrolled E
    -> WHERE C.cname = E.cname
    -> AND C.fid = F.fid);
+--------+
```

```
| fname  |
+--------+
| Harish |
| MV     |
| Mira   |
| Shiva  |
+--------+
4 rows in set (0.00 sec)

mysql> mysql>
mysql> SELECT DISTINCT S.sname
    -> FROM Student S
    -> WHERE S.snum NOT IN (SELECT E.snum
    -> FROM Enrolled E );


+-------+ |
sname |
+-------+
| Rita  |
+-------+
1 row in set (0.00 sec)

mysql> mysql> mysql>
SELECT S.age, S.lvl    ->
FROM STUDENT S
    -> GROUP BY S.age, S.lvl
    -> HAVING S.lvl IN (SELECT S1.lvl
    -> FROM STUDENT S1
    -> WHERE S1.age=S.age
    -> GROUP BY S1.age, S1.lvl
    -> HAVING COUNT(*) >= ALL (SELECT COUNT(*)
    -> FROM STUDENT S2
    -> WHERE S1.age=S2.age
    -> GROUP BY S2.lvl, S2.age))
    -> ORDER BY S.age;
+------+------+
| age  | lvl  |
+------+------+
|   19 | Sr   |
|   20 | Jr   |
|   21 | Sr   |
+------+------+
```

FLIGHT DATABASE:-

Consider the following database that keeps track of airline flight information:

FLIGHTS (flno: integer, from: string, to: string, distance: integer, departs: time, arrives: time, price: integer)
AIRCRAFT (aid: integer, aname: string, cruisingrange: integer) CERTIFIED (eid: integer, aid: integer)
EMPLOYEE (eid: integer, ename: string, salary: integer)
Note that the Employees relation describes pilots and other kinds of employees as well; Every pilot is certified for some aircraft, and only pilots are certified to fly. Write each of the following queries in SQL.

- i.   **Find the names of aircraft such that all pilots certified to operate them have salaries more than Rs.80,000.**
- ii.   **ii. For each pilot who is certified for more than three aircrafts, find the eid and the maximum cruising range of the aircraft for which she or he is certified.**
- iii. **iii. Find the names of pilots whose salary is less than the price of the cheapest route from Bengaluru to Frankfurt.**
- iv.   **iv. For all aircraft with cruising range over 1000 Kms, find the name of the aircraft and the average salary of all pilots certified for this aircraft.**
- v.   **v. Find the names of pilots certified for some Boeing aircraft.**
- vi.   **vi. Find the aids of all aircraft that can be used on routes from Bengaluru to New Delhi.**
- vii. **vii. A customer wants to travel from Madison to New York with no more than two changes of flight. List the choice of departure times from Madison if the customer wants to arrive in New York by 6 p.m.**
- viii. **viii. Print the name and salary of every non-pilot whose salary is more than the average salary for pilots.**

mysql> create database flightdb; Query
OK, 1 row affected (0.20 sec)

mysql> use flightdb;
Database   changed
mysql>
mysql> create table flights(

```
        -> flno int,
        ->     fromplace varchar(15),
        ->     toplace varchar(15),
        ->     distance int,
        ->     departs datetime,
        ->     arrives datetime,
        ->     price int,
        ->     primary key (flno)
        -> );
Query OK, 0 rows affected (0.67 sec)

mysql> desc flights;

+-----------+-------------+------+-----+---------+-------+
| Field     | Type        | Null | Key | Default | Extra |
+-----------+-------------+------+-----+---------+-------+
| flno      | int         | NO   | PRI | NULL    |       |
| fromplace | varchar(15) | YES  |     | NULL    |       |
| toplace   | varchar(15) | YES  |     | NULL    |       |
| distance  | int         | YES  |     | NULL    |       |
| departs   | datetime    | YES  |     | NULL    |       |
| arrives   | datetime    | YES  |     | NULL    |       |
| price     | int         | YES  |     | NULL    |       |
+-----------+-------------+------+-----+---------+-------+
7 rows in set (0.09 sec)

mysql> create table aircraft(
        -> aid int,
        ->     aname varchar(15),
        ->     cruisingrange int,
        ->     primary key (aid)
        -> );
Query OK, 0 rows affected (1.19 sec)

mysql> desc aircraft;
+---------------+-------------+------+-----+---------+-------+
| Field         | Type        | Null | Key | Default | Extra |
+---------------+-------------+------+-----+---------+-------+
| aid           | int         | NO   | PRI | NULL    |       |
| aname         | varchar(15) | YES  |     | NULL    |       |
| cruisingrange | int         | YES  |     | NULL    |       |
+---------------+-------------+------+-----+---------+-------+
3 rows in set (0.00 sec)

mysql> create table employees (
        -> eid int,
        ->     ename varchar(15),
        ->     salary int,
        ->     primary key (eid)
```

```
    -> );
Query OK, 0 rows affected (0.40 sec)
```

mysql> desc employees;

Field	Type	Null	Key	Default	Extra
eid	int	NO	PRI	NULL	
ename	varchar(15)	YES		NULL	
salary	int	YES		NULL	

3 rows in set (0.00 sec)

```
mysql> create table certified (
    -> eid int,
    ->    aid int,
    ->    foreign key (eid) references employees(eid),
    ->    foreign key (aid) references aircraft(aid)
    -> );
Query OK, 0 rows affected (0.95 sec)
```

mysql> desc certified;

Field	Type	Null	Key	Default	Extra
eid	int	YES	MUL	NULL	
aid	int	YES	MUL	NULL	

2 rows in set (0.00 sec)

```
mysql> insert into flights values(101, 'Bangalore', 'Delhi', 2500, '2005-05-13 07:15:31', '2005-05-13
18:15:31', 5000);
Query OK, 1 row affected (0.06 sec)

mysql> insert into flights values(102, 'Bangalore', 'Lucknow', 3000, '2013-05-05 07:15:31', '2013-05-05
11:15:31', 6000);
Query OK, 1 row affected (0.13 sec)

mysql> insert into flights values(103, 'Lucknow', 'Delhi', 500, '2013-05-05 12:15:31', '2013-05-05 17:15:31',
3000);
Query OK, 1 row affected (0.12 sec)

mysql> insert into flights values(107, 'Bangalore', 'Frankfurt', 8000, '2013-05-05 07:15:31', '2013-05-05
22:15:31', 60000);
Query OK, 1 row affected (0.23 sec)

mysql> insert into flights values(104, 'Bangalore', 'Frankfurt', 8500, '2013-05-05 07:15:31', '2013-05-05
23:15:31', 75000);
Query OK, 1 row affected (0.08 sec)
```

mysql> insert into flights values(105, 'Kolkata', 'Delhi', 3400, '2013-05-05 07:15:31', '2013-05-05 09:15:31', 7000);
Query OK, 1 row affected (0.10 sec)

mysql> insert into flights values(106, 'Bangalore', 'Kolkata', 1000, '2013-05-05 01:15:30', '2013-05-05 09:20:30', 10000);
Query OK, 1 row affected (0.06 sec)

mysql> insert into flights values(108, 'Lucknow', 'Kolkata', 1000, '2013-05-05 11:30:30', '2013-05-05 15:20:30', 10000);
Query OK, 1 row affected (0.13 sec)

mysql> mysql>
commit;
Query OK, 0 rows affected (0.00 sec)

mysql>
mysql> select * from flights; +------+-----------+-----------+----------+---------------------+---------------------+-------+
| flno | fromplace | toplace | distance | departs | arrives | price |
+------+-----------+-----------+----------+---------------------+---------------------+-------+
101	Bangalore	Delhi	2500	2005-05-13 07:15:31	2005-05-13 18:15:31	5000
102	Bangalore	Lucknow	3000	2013-05-05 07:15:31	2013-05-05 11:15:31	6000
103	Lucknow	Delhi	500	2013-05-05 12:15:31	2013-05-05 17:15:31	3000
104	Bangalore	Frankfurt	8500	2013-05-05 07:15:31	2013-05-05 23:15:31	75000
105	Kolkata	Delhi	3400	2013-05-05 07:15:31	2013-05-05 09:15:31	7000
106	Bangalore	Kolkata	1000	2013-05-05 01:15:30	2013-05-05 09:20:30	10000
107	Bangalore	Frankfurt	8000	2013-05-05 07:15:31	2013-05-05 22:15:31	60000
108	Lucknow	Kolkata	1000	2013-05-05 11:30:30	2013-05-05 15:20:30	10000
+------+-----------+-----------+----------+---------------------+---------------------+-------+ 8
rows in set (0.00 sec)

mysql>
mysql> insert into aircraft values(101, '747', 3000);
Query OK, 1 row affected (0.05 sec)

mysql> insert into aircraft values(102, 'Boeing', 900);
Query OK, 1 row affected (0.06 sec)

mysql> insert into aircraft values(103, '647', 800);
Query OK, 1 row affected (0.07 sec)

mysql> insert into aircraft values(104, 'Dreamliner', 10000);
Query OK, 1 row affected (0.08 sec)

mysql> insert into aircraft values(105, 'Boeing', 3500);
Query OK, 1 row affected (0.22 sec)

mysql> insert into aircraft values(106, '707', 1500);
Query OK, 1 row affected (0.13 sec)

mysql> insert into aircraft values(107, 'Dream', 120000);
Query OK, 1 row affected (0.08 sec)

mysql> insert into aircraft values(108, '707', 760);
Query OK, 1 row affected (0.11 sec)

mysql> insert into aircraft values(109, '747', 1000);
Query OK, 1 row affected (0.05 sec)

mysql> commit;
Query OK, 0 rows affected (0.00 sec)

mysql>
mysql> select * from aircraft;

```
+-----+------------+---------------+
| aid | aname      | cruisingrange |
+-----+------------+---------------+
| 101 | 747        |          3000 |
| 102 | Boeing     |           900 |
| 103 | 647        |           800 |
| 104 | Dreamliner |         10000 |
| 105 | Boeing     |          3500 |
| 106 | 707        |          1500 |
| 107 | Dream      |        120000 |
| 108 | 707        |           760 |
| 109 | 747        |          1000 |
+-----+------------+---------------+
9 rows in set (0.00 sec)
```

mysql>
mysql> insert into employees values(701, 'A', 50000);
Query OK, 1 row affected (0.08 sec)

mysql> insert into employees values(702, 'B', 100000);
Query OK, 1 row affected (0.23 sec)

mysql> insert into employees values(703, 'C', 150000);
Query OK, 1 row affected (0.24 sec)

mysql> insert into employees values(704, 'D', 90000);

Query OK, 1 row affected (0.18 sec)

mysql> insert into employees values(705, 'E', 40000);
Query OK, 1 row affected (0.05 sec)

mysql> insert into employees values(706, 'F', 60000);
Query OK, 1 row affected (0.08 sec)

mysql> insert into employees values(707, 'G', 90000);
Query OK, 1 row affected (0.05 sec)

mysql> commit;
Query OK, 0 rows affected (0.00 sec)

mysql>
mysql> select * from employees;
+-----+-------+--------+
| eid | ename | salary |
+-----+-------+--------+
701	A	50000
702	B	100000
703	C	150000
704	D	90000
705	E	40000
706	F	60000
707	G	90000
+-----+-------+--------+
7 rows in set (0.00 sec)

mysql>
mysql> insert into certified values(701, 101);
Query OK, 1 row affected (0.09 sec)

mysql> insert into certified values(701, 102);
Query OK, 1 row affected (0.16 sec)

mysql> insert into certified values(701, 106);
Query OK, 1 row affected (0.09 sec)

mysql> insert into certified values(701, 105);
Query OK, 1 row affected (0.17 sec)

mysql>
mysql> insert into certified values(702, 104);
Query OK, 1 row affected (0.10 sec)

mysql> insert into certified values(703, 104);
Query OK, 1 row affected (0.22 sec)

```
mysql> insert into certified values(704, 104);
Query OK, 1 row affected (0.06 sec)

mysql>
mysql> insert into certified values(702, 107);
Query OK, 1 row affected (0.07 sec)

mysql> insert into certified values(703, 107);
Query OK, 1 row affected (0.12 sec)

mysql> insert into certified values(704, 107);
Query OK, 1 row affected (0.06 sec)

mysql>
mysql> insert into certified values(702, 101);
Query OK, 1 row affected (0.07 sec)

mysql> insert into certified values(702, 108);
Query OK, 1 row affected (0.07 sec)

mysql> insert into certified values(701, 109);
Query OK, 1 row affected (0.11 sec)

mysql> commit; Query OK, 0 rows
affected (0.00 sec)

mysql> select * from certified;
```

```
+------+------+
| eid  | aid  |
+------+------+
| 701  | 101  |
| 701  | 102  |
| 701  | 106  |
| 701  | 105  |
| 702  | 104  |
| 703  | 104  |
| 704  | 104  |
| 702  | 107  |
| 703  | 107  |
| 704  | 107  |
| 702  | 101  |
| 702  | 108  |
| 701  | 109  |
+------+------+
13 rows in set (0.00 sec)
```

```
mysql> mysql> --
Query 1
mysql> select distinct a.aname from aircraft a where a.aid in (
    -> select c.aid from certified c, employees e where
    ->    c.eid = e.eid and not exists(
    -> select * from employees e1 where e1.eid=e.eid and e1.salary<80000
    ->    )
    -> );
+------------+
| aname      |
+------------+
| 747        |
| Dreamliner |
| Dream      |
| 707        |
+------------+
4 rows in set (0.00 sec)

mysql> mysql> --
Query 2
mysql> select max(a.cruisingrange), c.eid from certified c, aircraft a where c.aid = a.aid group by c.eid
having count(c.eid)>3;




+---------------------+------+
| max(a.cruisingrange) | eid  |
+---------------------+------+
|                3500 |  701 |
|              120000 |  702 |
+---------------------+------+
2 rows in set (0.00 sec)

mysql>
mysql> -- Query 3
mysql> select ename from employees where salary <(
    -> select min(price) from flights where fromplace='Bangalore' and toplace='Frankfurt'); +-------+
| ename |
+-------+
| A     |
| E     |
+-------+
2 rows in set (0.00 sec)

mysql> mysql> --
Query 4 mysql>
```

```
mysql> select avg(e.salary), c.aid from certified c, employees e where c.aid in(    ->
select aid from aircraft where cruisingrange>1000) and e.eid = c.eid group by c.aid; +----
-----------+------+
| avg(e.salary) | aid  |
+--------------+------+
|   75000.0000 |  101 |
|  113333.3333 |  104 |
|   50000.0000 |  105 |
|   50000.0000 |  106 |
|  113333.3333 |  107 |
+--------------+------+
5 rows in set (0.00 sec)

mysql> mysql> --
Query 5
mysql> select ename from employees where eid in(
-> select eid from certified where aid in(
   -> select aid from aircraft where aname = 'Boeing'));
+-------+
| ename |
+-------+
| A     |
+-------+
1 row in set (0.00 sec)

mysql> mysql> --
Query 6 mysql>
mysql> select aname from aircraft where cruisingrange > any (select distance from flights where
fromplace='Bangalore' and toplace='Delhi');
+------------+
| aname      |
+------------+
| 747        |
| Dreamliner |
| Boeing     |
| Dream      |
+------------+
4 rows in set (0.00 sec)

mysql> mysql> mysql> -- Query 7
mysql> SELECT F.flno, F.departs
   -> FROM flights F
   -> WHERE F.flno IN ( ( SELECT F0.flno
   -> FROM flights F0
   -> WHERE F0.fromplace = 'Bangalore' AND F0.toplace = 'Kolkata'
   -> AND extract(hour from F0.arrives) < 18 )
   -> UNION
   -> ( SELECT F0.flno
   -> FROM flights F0, flights F1
```

```
    ->  WHERE F0.fromplace = 'Bangalore' AND F0.toplace <> 'Kolkata'
    ->  AND F0.toplace = F1.fromplace AND F1.toplace = 'Kolkata'
    ->  AND F1.departs > F0.arrives
    ->  AND extract(hour from F1.arrives) < 18)
    ->  UNION
    -> ( SELECT F0.flno
    ->  FROM flights F0, flights F1, flights F2
    ->  WHERE F0.fromplace = 'Bangalore'
    ->  AND F0.toplace = F1.fromplace
    ->  AND F1.toplace = F2.fromplace
    ->  AND F2.toplace = 'Kolkata'
    ->  AND F0.toplace <> 'Kolkata'
    ->  AND F1.toplace <> 'Kolkata'
    ->  AND F1.departs > F0.arrives
    ->  AND F2.departs > F1.arrives
    ->  AND extract(hour from F2.arrives) < 18));
+------+---------------------+
| flno | departs             |
+------+---------------------+
|  102 | 2013-05-05 07:15:31 |
|  106 | 2013-05-05 01:15:30 |
+------+---------------------+
```