PROGRAM 1: INSURANCE DATABASE

Consider the Insurance database given below. The data types are specified.

PERSON (driver_id: String, name: String, address: String)

CAR (reg_num: String, model: String, year: int)

ACCIDENT (report_num: int, accident_date: date, location: String)

OWNS (driver_id: String, reg_num: String)

PARTICIPATED (driver_id: String,reg_num: String, report_num: 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

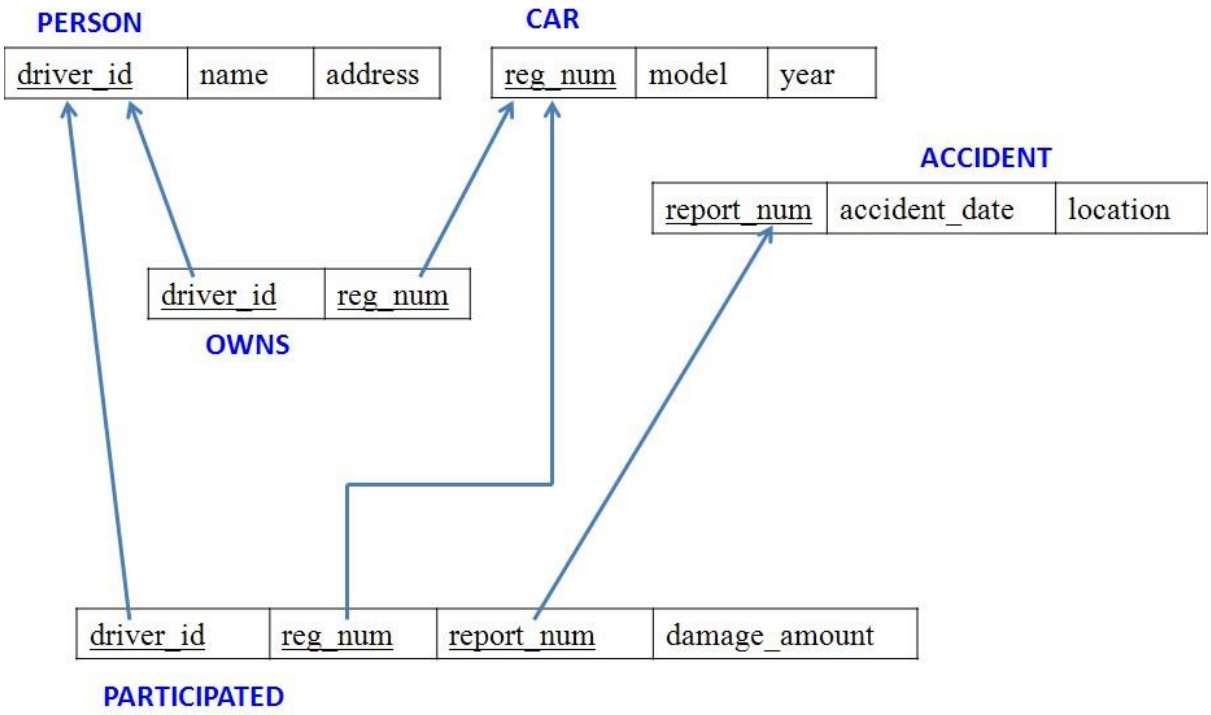
a.Update the damage amount to 25000 for the car with a specific reg-num(example 'K A053408') for which the accident report number was 12.

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 (example)were involved.

Schema diagram



PERSON

driver_id	name	address
A01	Richard	Srinivas nagar
A02	Pradeep	Rajaji nagar
A03	Smith	Ashok nagar
A04	Venu	N R Colony
A05	Jhon	Hanumanth nagar

CAR

reg_num	model	year
KA052250	Indica	1990
KA031181	Lancer	1957
KA095477	Toyota	1998
KA053408	Honda	2008
KA041702	Audi	2005

OWNS

driver_id	reg_num
A01	KA052250
A02	KA053408
A03	KA031181
A04	KA095477
A05	KA041702

ACCIDENT

report_num	accident_date	location
11	01-JAN-03	Mysore Road
12	02-FEB-04	South end Circle
13	21-JAN-03	Bull temple Road
14	17-FEB-08	Mysore Road
15	04-MAR-05	Kanakpura Road

PARTICIPATED

driver_id	reg_num	report_num	damage_amount
A01	KA052250	11	10000
A02	KA053408	12	50000
A03	KA095477	13	25000
A04	KA031181	14	3000
A05	KA041702	15	5000

Code of the program

```
create database sample7;

use sample7; create table

PERSON( driver_id char(20)

NOT NULL, Name_ char(30),

address char(50),

PRIMARY KEY (driver_id)

);


create table car(

reg_num char(20),

model char(30), year

int,

PRIMARY KEY(reg_num)

);


create table ACCIDENT(

report_num int,

accident_date date, location

char(50),

PRIMARY KEY(report_num)

);
```

```
create table OWNS(
driver_id char(20), reg_num
char(20),
FOREIGN KEY(driver_id) references PERSON(driver_id),
FOREIGN KEY(reg_num) references car(reg_num)
);

create table PARTICIPATED(
driver_id char(20), reg_num
char(20), report_num int,
damage_amount int,
FOREIGN KEY(driver_id) references PERSON(driver_id),
FOREIGN KEY(reg_num) references car(reg_num),
FOREIGN KEY(report_num) references ACCIDENT(report_num)
);

insert into PERSON
values ("A01","RICHARD","SRINIVAS NAGAR"),("A02","PRADEEP","RAJAJI
NAGAR"),("A03","SMITH","ASHOK NAGAR"),("A04","VENU","N R
COLONY"),("A05","JHON","HANUMANYH NAGAR");
select* from PERSON;

insert into car
values
("KA052250","INDICA",1990),("KA031181","LANCER",1957),("KA095477","TOYOTA",1998),("KA0534
08","HONDA",2008),("KA041702","AUDI",2005); select*
from car;

insert into ACCIDENT
values (11,"2003-01-01","MYSORE ROAD"),(12,"2004-02-02","SOUTH END CIRCLE"),(13,"2003-01-
```

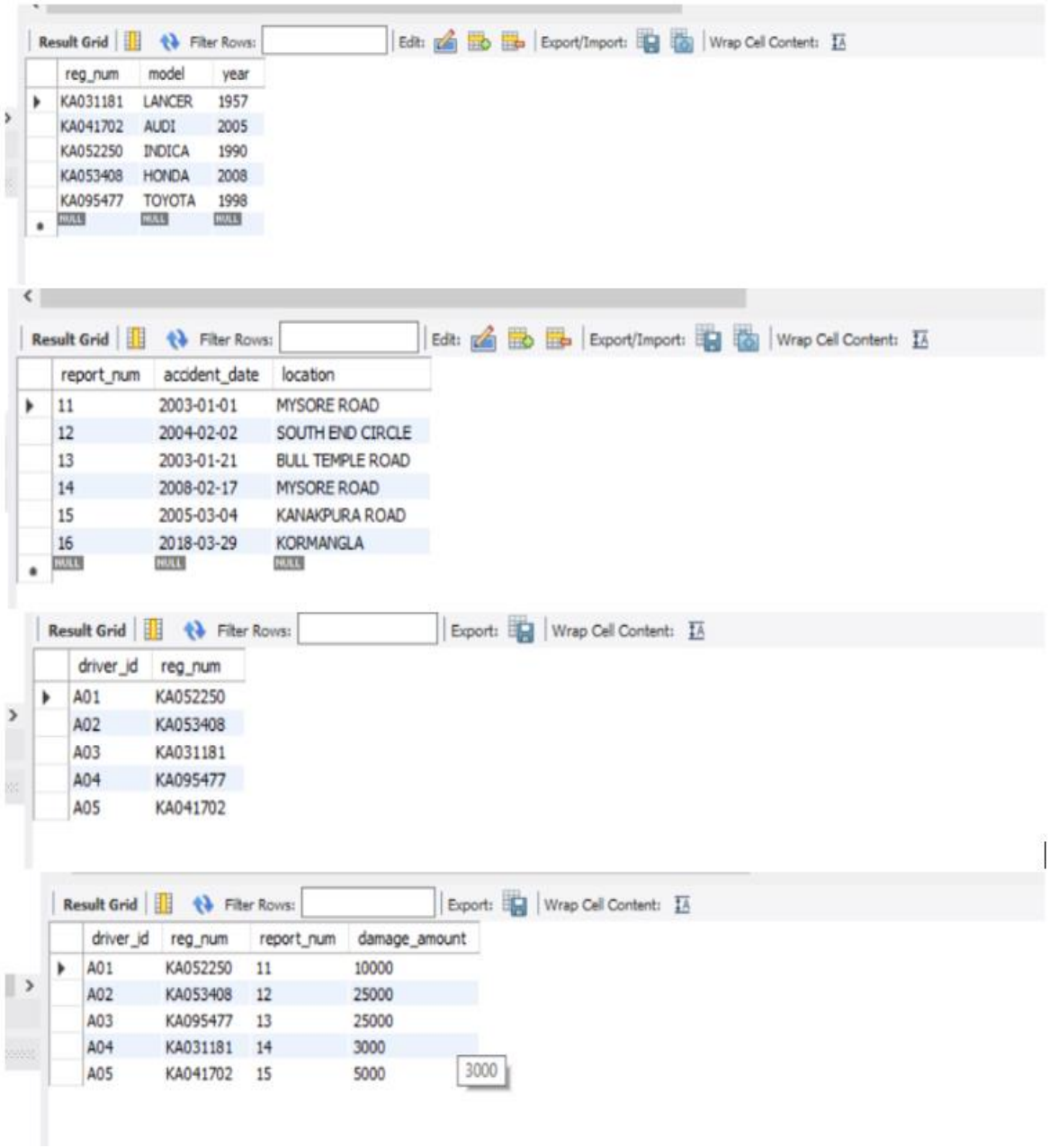
```
21","BULL TEMPLE ROAD"); select*
from ACCIDENT;

insert into ACCIDENT values (14,"2008-02-17","MYSORE ROAD"),(15,"2005-03-
04","KANAKPURA ROAD"); select* from ACCIDENT;

insert into OWNS
values
("A01","KA052250"),("A02","KA053408"),("A03","KA031181"),("A04","KA095477"),("A05","KA041702");
select* from OWNS;

insert into PARTICIPATED
values
("A01","KA052250",11,10000),("A02","KA053408",12,50000),("A03","KA095477",13,25000),("A04","KA031181",14,3000),("A05","KA041702",15,5000); select* from PARTICIPATED;

update PARTICIPATED
SET damage_amount=25000
WHERE reg_num="KA053408";

select* from PARTICIPATED;

insert into ACCIDENT values (16,"2018-
03-29","KORMANGLA"); select* from
ACCIDENT;

SELECT COUNT(accident_date) AS accidentsin2008 FROM ACCIDENT
WHERE YEAR(accident_date)=2008;

SELECT COUNT(model) AS carwithhondaomodel FROM car
```

WHERE model="HONDA";

select* from ACCIDENT where

accident_date="2008-02-17";

Output



Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

reg_num	model	year
KA031181	LANCER	1957
KA041702	AUDI	2005
KA052250	INDICA	1990
KA053408	HONDA	2008
KA095477	TOYOTA	1998
NULL	NULL	NULL

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

report_num	accident_date	location
11	2003-01-01	MYSORE ROAD
12	2004-02-02	SOUTH END CIRCLE
13	2003-01-21	BULL TEMPLE ROAD
14	2008-02-17	MYSORE ROAD
15	2005-03-04	KANAKPURA ROAD
16	2018-03-29	KORMANGLA
NULL	NULL	NULL

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

driver_id	reg_num
A01	KA052250
A02	KA053408
A03	KA031181
A04	KA095477
A05	KA041702

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

driver_id	reg_num	report_num	damage_amount
A01	KA052250	11	10000
A02	KA053408	12	25000
A03	KA095477	13	25000
A04	KA031181	14	3000
A05	KA041702	15	5000

3000

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

accidentsin2008
1

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

carwithhondaomodel
1

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

report_num	accident_date	location
14	2008-02-17	MYSORE ROAD
NULL	NULL	NULL

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

driver_id	Name_	address
A01	RICHARD	SRINIVAS NAGAR
A02	PRADEEP	RAJAJI NAGAR
A03	SMITH	ASHOK NAGAR
A04	VENU	N R COLONY
A05	JHON	HANUMANYH NAGAR
NULL	NULL	NULL

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

driver_id	reg_num	report_num	damage_amount
A01	KA052250	11	10000
A02	KA053408	12	25000
A03	KA095477	13	25000
A04	KA031181	14	3000
A05	KA041702	15	5000

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

report_num	accident_date	location
11	2003-01-01	MYSORE ROAD
12	2004-02-02	SOUTH END CIRCLE
13	2003-01-21	BULL TEMPLE ROAD
14	2008-02-17	MYSORE ROAD
15	2005-03-04	KANAKPURA ROAD
16	2018-03-29	KORMANGLA
NULL	NULL	NULL

PROGRAM 2: BANKING ENTERPRISE DATABASE

Consider the following database for a banking enterprise.

Branch (branch-name: String, branch-city: String, assets: real)

BankAccount(accno: int, branch-name: String, balance: real)

BankCustomer (customer-name: String, customer-street: String, customer-city: String)

Depositer(customer-name: String, accno: int)

Loan (loan-number: int, branch-name: String, amount: real)

i. Create the above tables by properly specifying the primary keys and the foreign keys. ii. Enter at least five tuples for each relation.

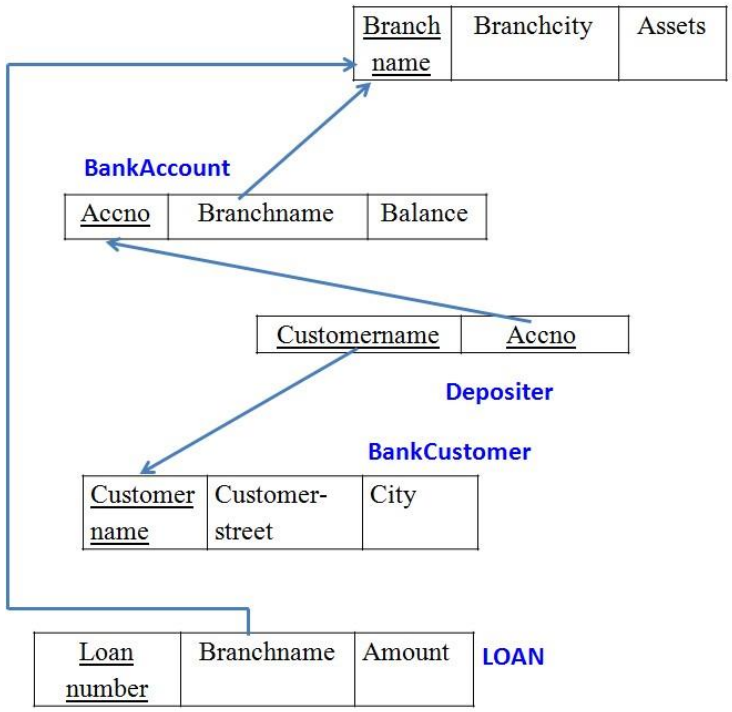
iii. Find all the customers who have at least two accounts at the Main branch (ex. SBI_ResidencyRoad).

iv. Find all the customers who have an account at all the branches located in a specific city (Ex. Delhi).

v. Demonstrate how you delete all account tuples at every branch located in a specific city (Ex. Bombay).

INTRODUCTION: This database is developed for supporting banking facilities. Details of the branch along with the accounts and loans handled by them are recorded. Also details of the depositors of the corresponding branches are maintained.

Schema Diagram



Code

```
create database sample11; use
sample11;

CREATE TABLE branch (
branch_name VARCHAR(20),
branch_city VARCHAR(20),
assets REAL,
PRIMARY KEY(branch_name)
);

CREATE TABLE accounts (
acc_no INT, branch_name
VARCHAR(50), balance
REAL,
PRIMARY KEY(acc_no),
```

```
FOREIGN KEY(branch_name) REFERENCES branch(branch_name)
ON UPDATE CASCADE ON DELETE CASCADE
);

CREATE TABLE customer (
customer_name VARCHAR(20),
customer_street VARCHAR(50),
customer_city VARCHAR(20),
PRIMARY KEY(customer_name)
);

CREATE TABLE depositor (
customer_name VARCHAR(20),
acc_no INT,
PRIMARY KEY(customer_name, acc_no),
FOREIGN KEY(customer_name) REFERENCES customer(customer_name)
ON UPDATE CASCADE ON DELETE CASCADE,
FOREIGN KEY(acc_no) REFERENCES accounts(acc_no)
ON UPDATE CASCADE ON DELETE CASCADE
);

CREATE TABLE loan (
loan_number INT,
branch_name VARCHAR(50),
amount REAL,
PRIMARY KEY(loan_number),
```

```
FOREIGN KEY(branch_name) REFERENCES branch(branch_name)
ON UPDATE CASCADE ON DELETE CASCADE
);
```

```
INSERT INTO branch(branch_name,branch_city,assets) VALUES
('SBI_Chamrajpet','Bangalore',50000),('SBI_ResidencyRoad','Bangalore',10000),
('SBI_ShivajiRoad','Bombay',20000),('SBI_ParlimentRoad','Delhi',10000),('SBI_J
antarmantar','Delhi',20000);
```

```
INSERT INTO accounts(acc_no,branch_name,balance) VALUES
(1,'SBI_Chamrajpet',2000),(2,'SBI_ResidencyRoad',5000),(3,'SBI_ShivajiRoad',6
000),(4,'SBI_ParlimentRoad',9000),(5,'SBI_Jantarmantar',8000),(6,'SBI_ShivajiR
oad',4000),(8,'SBI_ResidencyRoad',4000),(9,'SBI_ParlimentRoad',3000),(10,'SBI
_ResidencyRoad',5000),(11,'SBI_Jantarmantar',2000);
```

```
INSERT INTO customer(customer_name,customer_street,customer_city)
VALUES
('Avinash','Bull_Temple_Road','Bangalore'),('Dinesh','Bannergatta_Road','Bang
alore'),('Mohan','NationalCollege_Road','Bangalore'),('Nikil','Akbar_Road','Delh
i'),('Ravi','Prithviraj_Road','Delhi');
```

```
INSERT INTO depositor(customer_name,acc_no) VALUES
('Avinash',1),('Dinesh',2),('Nikil',4),('Ravi',5),('Avinash',8),('Nikil',9),('Dinesh',10),
('Nikil',11);
```

```
INSERT INTO loan(loan_number,branch_name,amount) VALUES
(1,'SBI_Chamrajpet',1000),(2,'SBI_ResidencyRoad',2000),(3,'SBI_ShivajiRoad',3
000),(4,'SBI_ParlimentRoad',4000),(5,'SBI_Jantarmantar',5000);
```

```
SELECT * FROM branch;
```

```
SELECT * FROM accounts;

SELECT * FROM customer;

SELECT * FROM depositor;

SELECT * FROM loan;


SELECT * FROM customer WHERE customer_name IN(SELECT customer_name
FROM depositor group by customer_name having
COUNT(customer_name)>=2);

SELECT d.customer_name FROM accounts a, depositor d,branch b WHERE
d.acc_no=a.acc_no AND b.branch_name=a.branch_name AND
b.branch_city="Delhi" GROUP BY d.customer_name having count(distinct
b.branch_name)=(SELECT COUNT(branch_name) FROM branch  WHERE
branch_city="Delhi");

DELETE FROM ACCOUNTS WHERE branch_name IN(SELECT branch_name
FROM BRANCH WHERE branch_city='Bombay');
```

Output

Result Grid | Filter Rows: | Edit: | Exp

branch_name	branch_city	assets
SBI_Chamrajpet	Bangalore	50000
SBI_Jantarmantar	Delhi	20000
SBI_ParlimentRoad	Delhi	10000
SBI_ResidencyRoad	Bangalore	10000
SBI_ShivajiRoad	Bombay	20000
NULL	NULL	NULL

Result Grid | Filter Rows: | Edit: | Export/Im

acc_no	branch_name	balance
1	SBI_Chamrajpet	2000
2	SBI_ResidencyRoad	5000
4	SBI_ParlimentRoad	9000
5	SBI_Jantarmantar	8000
8	SBI_ResidencyRoad	4000
9	SBI_ParlimentRoad	3000
10	SBI_ResidencyRoad	5000
11	SBI_Jantarmantar	2000
NULL	NULL	NULL

Result Grid | Filter Rows: | Edit: | Export/Imp

customer_name	customer_street	customer_city
Avinash	Bull_Temple_Road	Bangalore
Dinesh	Bannergatta_Road	Bangalore
Mohan	NationalCollege_Road	Bangalore
Nikil	Akbar_Road	Delhi
Ravi	Prithviraj_Road	Delhi
NULL	NULL	NULL

Result Grid | Filter Rows: | Edit: | Expor

customer_name	acc_no
Avinash	1
Dinesh	2
Nikil	4
Ravi	5
Avinash	8
Nikil	9
Dinesh	10
Nikil	11
NULL	NULL

Result Grid | Filter Rows: | Edit: | Export

loan_number	branch_name	amount
1	SBI_Chamrajpet	1000
2	SBI_ResidencyRoad	2000
3	SBI_ShivajiRoad	3000
4	SBI_ParlimentRoad	4000
5	SBI_Jantarmantar	5000
NULL	NULL	NULL

Result Grid | Filter Rows: | Edit: | Export

customer_name	customer_street	customer_city
Avinash	Bull_Temple_Road	Bangalore
Dinesh	Bannergatta_Road	Bangalore
Nikil	Akbar_Road	Delhi
NULL	NULL	NULL

Result Grid | Filter Rows: | Export

customer_name
Nikil

PROGRAM 3: 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:

Find the pnames of parts for which there is some supplier.

Find the snames of suppliers who supply every part.

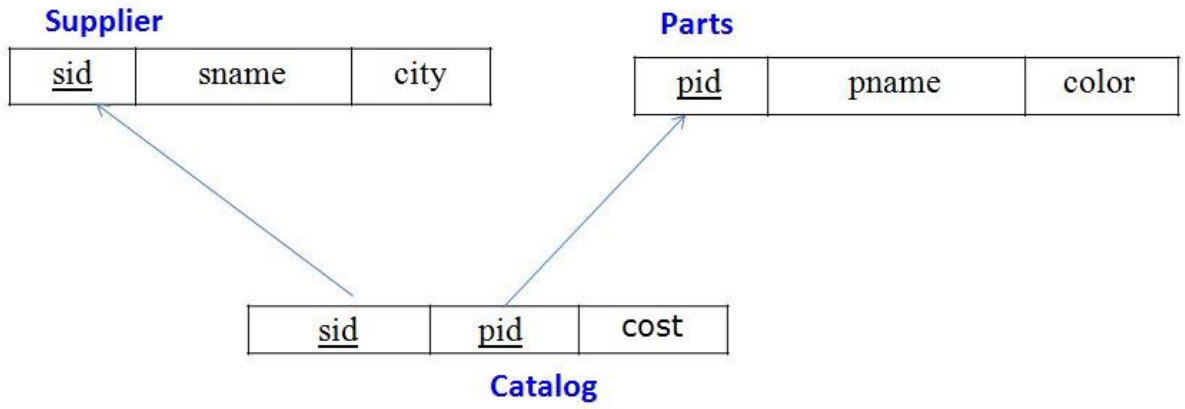
Find the snames of suppliers who supply every red part.

Find the pnames of parts supplied by Acme Widget Suppliers and by no one else.

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).

For each part, find the sname of the supplier who charges the most for that part.

Schema Diagram



Code

```
create database supplier; use
supplier;
CREATE TABLE suppliers(
   sid INT,
   sname VARCHAR(20),
address VARCHAR(50),
   PRIMARY KEY (sid)
);
CREATE TABLE parts(
   pid INT,
   pname VARCHAR(20),
color VARCHAR(10),
   PRIMARY KEY (pid)
);
CREATE TABLE catalog(
   sid INT,
pid INT,
cost REAL,
   PRIMARY KEY(sid,pid),
   FOREIGN KEY(sid) REFERENCES suppliers(sid)
   ON delete CASCADE ON update CASCADE,
   FOREIGN KEY(pid) REFERENCES parts(pid)
   ON delete CASCADE ON update CASCADE
);


insert into suppliers values (10001,'Acme Widget','Bangalore'), (10002,'Johns','Kolkata'),
(10003,'Vimal','Mumbai'),(10004,'Reliance','Delhi');
insert into parts values
(20001,'Book','Red'),(20002,'Pen','Red'),(20003,'Pencil','Green'),(20004,'Mobile','Green'),(20
```

```
005,'Charger','Black');

insert into catalog
values(10001,20001,10),(10001,20002,10),(10001,20003,30),(10001,20004,10),(10001,2000
5,10),(10002,20001,10),(10002,20002,20),(10003,20003,30),(10004,20003,40);


SELECT * FROM suppliers;

SELECT * FROM parts;

SELECT * FROM catalog;


SELECT DISTINCT p.pname FROM parts p, catalog c WHERE p.pid = c.pid;

select suppliers.sname from suppliers where suppliers.sid in(select catalog.sid from catalog
inner join

parts on catalog.pid=parts.pid group by catalog.sid having count(*)=(select count(parts.pid)
from

parts));

select suppliers.sname from suppliers where suppliers.sid in (select catalog.sid from catalog

inner join parts on catalog.pid=parts.pid where catalog.pid in (select parts.pid from parts

where

parts.color='Red') group by catalog.sid having count(*)=(select count(parts.color) from parts
where

parts.color='Red'));

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');

SELECT DISTINCT c.sid FROM catalog c WHERE c.cost > (SELECT AVG(C1.cost) FROM catalog
c1 WHERE c1.pid = c.pid) ;

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);
```

Output

Result Grid | Filter Rows: | Edit:

pid	pname	color
20001	Book	Red
20002	Pen	Red
20003	Pencil	Green
20004	Mobile	Green
20005	Charger	Black
NULL	NULL	NULL

Result Grid | Filter Rows: | Edit:

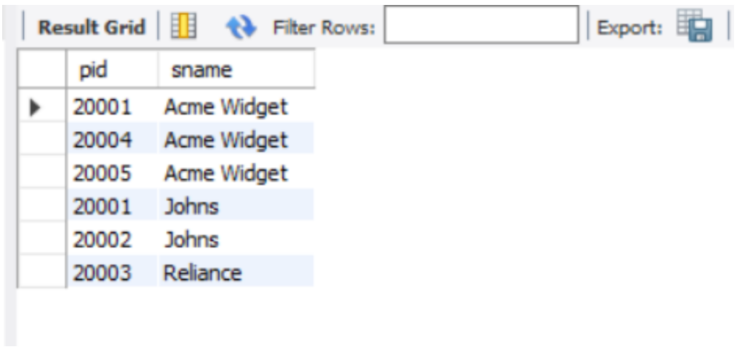
sid	pid	cost
10001	20001	10
10001	20002	10
10001	20003	30
10001	20004	10
10001	20005	10
10002	20001	10
10002	20002	20
10003	20003	30
10004	20003	40
NULL	NULL	NULL

Result Grid | Filter Rows: | Edit:

sid	sname	address
10001	Acme Widget	Bangalore
10002	Johns	Kolkata
10003	Vimal	Mumbai
10004	Reliance	Delhi
NULL	NULL	NULL

Result Grid | Filter Rows: | Export:

pname
Mobile
Charger



Result Grid | Filter Rows: | Export:

pid	sname
20001	Acme Widget
20004	Acme Widget
20005	Acme Widget
20001	Johns
20002	Johns
20003	Reliance

PROGRAM 4: STUDENT FACULTY DATABASE

Consider the following database for student

enrollment for course :

STUDENT(snum: integer, sname:string, major: string, lvl: string, age: integer)

CLASS(cname: string, meetsat: 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(lvl) 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 “name”

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 enrollment 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).

SQL> select * from student;

SNUM	SNAME	MA	LV	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

SQL> select * from faculty;

FID FNAME DEPTID

---------- -------------------- ----------

11 Harish 1000

12 MV 1000

13 Mira 1001 14 Shiva 1002

15 Nupur 1000

SQL> select * from class;

CNAME METTS_A ROOM FID

Class1 12/11/15 10:15:16.00000 R1 14

Class10 12/11/15 10:15:16.00000 R128 14

Class2 12/11/15 10:15:20.000000 R2 12 Class3 12/11/15 10:15:25.000000 R3 11 Class4 12/11/15 20:15:20.000000 R4 14

Class5 12/11/15 20:15:20.000000 R3 15

Class6 12/11/15 13:20:20.000000 R2 14 Class7 12/11/15 10:10:10.000000 R3 14

SQL> select * from enrolled;

SNUM CNAME

---------- --------------------

1 class1

2 class1 3

class3

4 class3

5 class4

Code

create database studentfaculty2; use

studentfaculty2;

create table STUDENT(

snum int, sname

varchar(60), major

varchar(50),

lvl varchar(50),

age int, primary

key(snum)

);

create table CLASS(

cname varchar(60),

```
meetsat timestamp, room
varchar(60),
fid int,
primary key (cname)
);

create table enrolled( snum int, cname
varchar(60), primary key(snum,cname),
foreign key(snum) references STUDENT(snum)
on update cascade on delete cascade, foreign
key(cname) references CLASS(cname) on
update cascade on delete cascade
);

create table FACULTY( fid
int,
fname varchar(60),
deptid int, primary
key(fid)
);

insert into STUDENT values (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);

insert into CLASS values ('Class1',"12/11/15 10:15:16.00000",'R1',14); select
* from CLASS;
```

```
delete from CLASS where cname='Class1'; select

* from CLASS;

insert into CLASS values ('Class1',"15/11/12 10:15:16.00000",'R1',14); select

* from CLASS;

insert into CLASS values ('Class10',"15/11/12 10:15:16.00000",'R128',14),
('Class2',"15/11/12 10:15:20.00000",'R2',12),

('Class3',"15/11/12 10:15:25.00000",'R3',11), ('Class4',"15/11/12
10:15:20.00000",'R4',14), ('Class5',"15/11/12 10:15:20.00000",'R3',15),

('Class6',"15/11/12 13:20:20.00000",'R2',14), ('Class7',"15/11/12
10:10:10.00000",'R3',14);


insert into ENROLLED values
(1,'Class1'),(2,'Class1'),(3,'Class3'),(4,'Class3'),(5,'Class4');


insert into FACULTY values
(11,'Harish',1000),(12,'MV',1000),(13,'Mira',1001),(14,'Shiva',1002),(15,'Nupur'
,1000);


select * from STUDENT;

select * from CLASS; select

* from ENROLLED; select *

from FACULTY;


select s.sname, f.fname from STUDENT s, CLASS c, FACULTY f,ENROLLED e
where s.snum=e.snum and s.lvl='Jr' and e.cname=c.cname and f.fid=c.fid;


select c.cname from class c where c.room = 'R128'

or c.cname in (select e.cname from enrolled e group by e.cname having
count(e.snum)>5);
```

```
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.meetsat = c2.meetsat);
```

```
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);
```

```
select distinct s.sname from student s
where s.snum not in(select e.snum from enrolled e);
```

Output

snum	sname	major	lvl	age
1	Jhon	CS	Jr	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
NULL	NULL	NULL	NULL	NULL

	fid	fname	deptid
▶	11	Harish	1000
	12	MV	1000
	13	Mira	1001
	14	Shiva	1002
	15	Nupur	1000
*	NULL	NULL	NULL

	cname	meetsat	room	fid
▶	Class1	2015-11-12 10:15:16	R1	14
	Class10	2015-11-12 10:15:16	R128	14
	Class2	2015-11-12 10:15:20	R2	12
	Class3	2015-11-12 10:15:25	R3	11
	Class4	2015-11-12 10:15:20	R4	14
	Class5	2015-11-12 10:15:20	R3	15
	Class6	2015-11-12 13:20:20	R2	14
	Class7	2015-11-12 10:10:10	R3	14
	NULL	NULL	NULL	NULL

	snum	cname
▶	1	Class1
	2	Class1
	3	Class3
	4	Class3
	5	Class4
*	NULL	NULL

PROGRAM 5: AIRLINE 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)

EMPLOYEES(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.

Find the names of aircraft such that all pilots certified to operate them have salaries more than Rs.80,000.

For each pilot who is certified for more than three aircrafts, find the eid and the maximum cruisingrange of the aircraft for which she or he is certified.

Find the names of pilots whose salary is less than the price of the cheapest route from Bengaluru to Frankfurt.

For all aircraft with cruisingrange over 1000 Kms, find the name of the aircraft and the average salary of all pilots certified for this aircraft.

Find the names of pilots certified for some Boeing aircraft.

Find the aids of all aircraft that can be used on routes from Bengaluru to New Delhi.

A customer wants to travel from Bangalore to Kolkata New with no more than two changes of flight. List the choice of departure times from Madison if the customer wants to arrive in Kolkata by 6 p.m.

SQL> select * from Flights;

FLNO FFROM TO DISTANCE DEPARTS ARRIVES PRICE

101 Bangalore Delhi 2500 13-MAY-05 07.15.31.000000 AM13-MAY-05 07.15.31.000000 A 5000

102 Bangalore Lucknow 3000 05/05/13 07:15:31.000000 05/05/13 11:15:31.000000 6000

103 Lucknow Delhi 500 05/05/13 12:15:31.000000 05/05/13 17:15:31.000000 3000

107 Bangalore Frankfurt 8000 05/05/13 07:15:31.000000 05/05/13 22:15:31.000000 60000

104 Bangalore Frankfurt 8500 05/05/13 07:15:31.000000 05/05/13 23:15:31.00000 75000

105 Kolkata Delhi 3400 05/05/13 07:15:31.000000 05/05/13 09:15:31.000000 7000

SQL> 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

7 rows selected.

SQL> 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

EID AID

---------- ----------

703 105

704 105

705 103

14 rows selected.

SQL> 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 selected.

Code

```
CREATE DATABASE AIRLINE_FLIGHT_DATABASE;

USE AIRLINE_FLIGHT_DATABASE;

CREATE TABLE FLIGHTS
(
        flno int,
   ffrom varchar(40),
tto varchar(40),
distance int,
departs datetime,
arrives datetime,
price int,    primary
key(flno)
);

CREATE TABLE AIRCRAFT
(
        aid int,
```

```
   aname varchar(40),
cruisingrange int,
        primary key(aid)
);

CREATE TABLE EMPLOYEES
(
        eid int,
   ename varchar(40),
salary int,     primary
key(eid)
);

CREATE TABLE CERTIFIED
(
        eid int,
   aid int,
   FOREIGN KEY(aid) REFERENCES AIRCRAFT(aid),
   FOREIGN KEY(eid) REFERENCES EMPLOYEES(eid)
);



INSERT INTO FLIGHTS
VALUES (101,"Bangalore","Delhi",2500,'2005-05-13:07:15:31.000000','2005-
05-13:07:15:31.000000',5000), (102,"Bangalore","Lucknow",3000,'2013-05-
05:07:15:31.000000','2013-
05-05:11:15:31.000000',6000),
```

```
(103,"Lucknow","Delhi",500,'2013-05-05:12:15:31.000000','2013-
0505:17:15:31.000000',3000),

(107,"Bangalore","Frankfurt",8000,'2013-05-
05:07:15:31.000000','201305-05:22:15:31.000000',60000),

(104,"Bangalore","Frankfurt",8500,'2013-05-
05:07:15:31.000000','201305-05:23:15:31.000000',75000),

(105,"Kolkata","Delhi",3400,'2013-05-05:07:15:31.000000','2013-
0505:09:15:31.000000',7000);

SELECT * FROM FLIGHTS;


INSERT INTO AIRCRAFT

VALUES
(101,747,3000),(102,"Boeing",900),(103,647,800),(104,"Dreamliner",10000),

        (105,"Boeing",3500),(106,707,1500),(107,"Dream",120000);

 SELECT * FROM AIRCRAFT;


INSERT INTO  EMPLOYEES

VALUES (701,"A",50000),(702,"B",100000),(703,"C",150000),(704,"D",90000),

        (705,"E",40000),(706,"F",60000),(707,"G",90000);

SELECT * FROM EMPLOYEES;


INSERT INTO CERTIFIED

VALUES
(701,101),(701,102),(701,106),(701,105),(702,104),(703,104),(704,104),(702,10
7),

        (703,107),(704,107),(702,101),(703,105),(704,105),(705,103);

SELECT * FROM CERTIFIED;

SELECT distinct a.aname

FROM  AIRCRAFT a,EMPLOYEES e,CERTIFIED c
```

```
WHERE a.aid=c.aid and e.eid=c.eid and e.salary>80000;

SELECT e.eid,e.ename,max(a. cruisingrange)
FROM EMPLOYEES e,CERTIFIED c,AIRCRAFT a
WHERE e.eid=c.eid and a.aid=c.aid group by
e.ename  having count(c.aid)>3;

SELECT e.ename
FROM EMPLOYEES e
WHERE salary < (select min(price)
        from FLIGHTS
        where ffrom="Bangalore" and tto="Frankfurt");

SELECT a.aname,a.cruisingrange,avg(e.salary)
FROM AIRCRAFT a,EMPLOYEES e,CERTIFIED c
WHERE c.eid=e.eid and c.aid=a.aid group by
a.aname having a.cruisingrange > 1000;

SELECT distinct e.ename
FROM EMPLOYEES e,CERTIFIED c,AIRCRAFT a
WHERE e.eid=c.eid and a.aid=c.aid and aname like "Boeing"; SELECT a.aid
FROM AIRCRAFT a
WHERE a. cruisingrange >= (select distance
                                    from FLIGHTS
                where ffrom="Bangalore" and tto="Delhi");
```

```
SELECT  f.ffrom,f.tto,f.arrives
FROM    FLIGHTS f
WHERE (f.ffrom="Bangalore" and f.tto=(select ffrom
                                      from FLIGHTS
                    where tto="Kolkata")) or f.tto="Kolkata";
```

Output

fino	ffrom	tto	distance	departs	arrives	price
101	Bangalore	Delhi	2500	2005-05-13 07:15:31	2005-05-13 07:15:31	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
107	Bangalore	Frankfurt	8000	2013-05-05 07:15:31	2013-05-05 22:15:31	60000
NULL	NULL	NULL	NULL	NULL	NULL	NULL

---

aid	aname	cruisingrange
101	747	3000
102	Boeing	900
103	647	800
104	Dreamliner	10000
105	Boeing	3500
106	707	1500
107	Dream	120000
NULL	NULL	NULL

---

	eid	ename	salary
▶	701	A	50000
	702	B	100000
	703	C	150000
	704	D	90000
	705	E	40000
	706	F	60000
	707	G	90000
*	NULL	NULL	NULL

	eid	aid
▶	701	101
	701	102
	701	106
	701	105
	702	104
	703	104
	704	104
	702	107
	703	107
	704	107
	702	101
	703	105
	704	105
	705	103

	aname	cruisingrange	avg(e.salary)
▶	747	3000	75000.0000
	Dreamliner	10000	113333.3333
	707	1500	50000.0000
	Dream	120000	113333.3333

	ffrom	tto	arrives