ISHA SINGH
1BM19CS218
SECTION-4A

Question:

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 were involved in accidents in 2008. v)Find the number of accidents in which cars belonging to a specific model (example)were involved.

Person Table

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

Car Table

KA052250	Indica	1990
KA053408	Honda	2008
KA095477	Toyota	1998
NULL	NULL	NULL

Accident Table

report_num	accindent_date	location
11	2001-01-03	Mysore Road
12	2002-02-03	South and Circle
13	2021-01-03	Bull temple Road
14	2017-02-08	Mysore Road
15	2004-03-05	Kanakpura Road
16	2008-03-15	Domlur
NULL	NULL	NULL

Owns Table

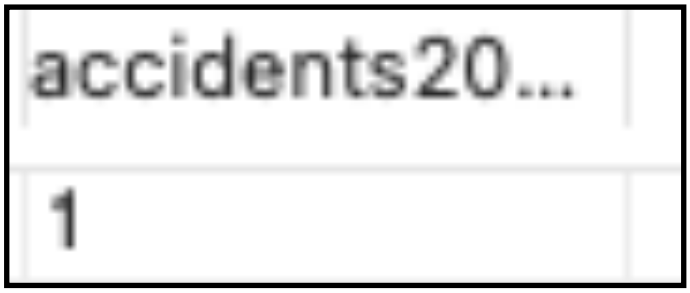
driver_id	reg_num
A03	KA031181
A05	KA041702
A01	KA052250
A02	KA053408
A04	KA095477
NULL	NULL

Participated Table

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
NULL	NULL	NULL	NULL

Find the total number of people who owned cars that involved in accidents in 2008.

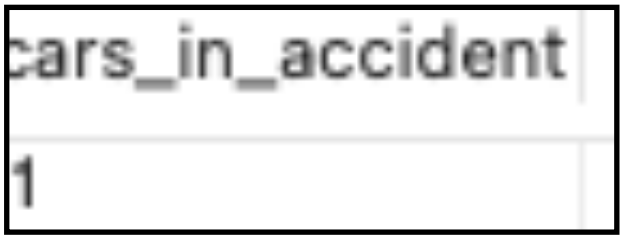
```
select count(distinct driver_id)
from Participated p,Accident a
where p.report_num=a.report_num AND a.accindent_date like '2008%';
```



accidents20...
1

Find the number of accidents in which cars belonging to a

```
select count(*)
from Participated p, Car c
where p.reg_num=c.reg_num and
c.model='Lancer';
```



cars_in_accident
1

Add a new accident to database- (16,2008-03-15,Domlur)

```
insert into
Accident(report_num,accindent_date,loc
ation)
values(16,'2008-03-15','Domlur');
select * from Accident;
```

report_num	accindent_date	location
11	2001-01-03	Mysore Road
12	2002-02-03	South and Circle
13	2021-01-03	Bull temple Road
14	2017-02-08	Mysore Road
15	2004-03-05	Kanakpura Road
16	2008-03-15	Domlur
NULL	NULL	NULL

update damage amount to 25000 for car with report_num 12 and

```
update Participated set
damage_amount=25000 where
report_num=12 and
reg_num="KA053408";
```

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
NULL	NULL	NULL	NULL

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SECTION-4A

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).

BRANCH TABLE

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

LOAN TABLE

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

BANK ACCOUNT TABLE

accno	branch_name	balance
1	SBI_Chamrajpet	2000
2	SBI_ResidencyRoad	5000
3	SBI_ShivajiRoad	6000
4	SBI_ParlimentRoad	9000
5	SBI_Jantarmantar	8000
6	SBI_ShivajiRoad	4000
8	SBI_ResidencyRoad	4000
9	SBI_ParlimentRoad	3000
10	SBI_ResidencyRoad	5000
11	SBI_Jantarmantar	2000

CUSTOMER TABLE

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

DEPOSITOR TABLE

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

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

```
SELECT customer_name

FROM depositor d,BankAccount a

 WHERE d.accno=a.accno

 AND a.branch_name='SBI_ResidencyRoad'

 GROUP BY d.customer_name

  HAVING COUNT(d.customer_name)>=2;
```

customer_name
Dinesh

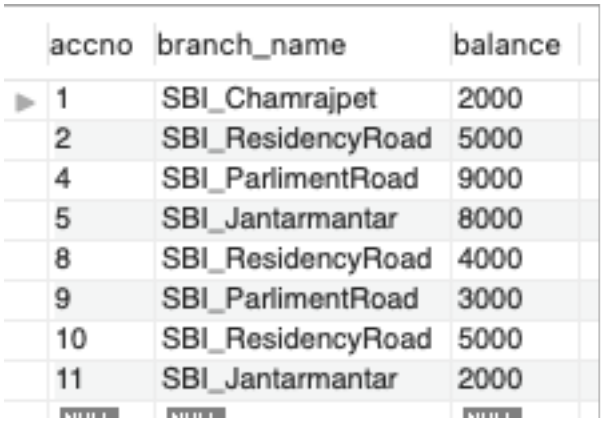
Find all the customers who have an account at *all* the branches located in a specific city (Ex. Delhi)

```
select d.customer_name, b.branch_city,count(b.branch_name)

from Depositor d,BankAccount a, Branch b

where a.accno=d.accno 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(*)

from branch

where branch_city=“Delhi");
```

customer_name
Nikil

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

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



accno	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

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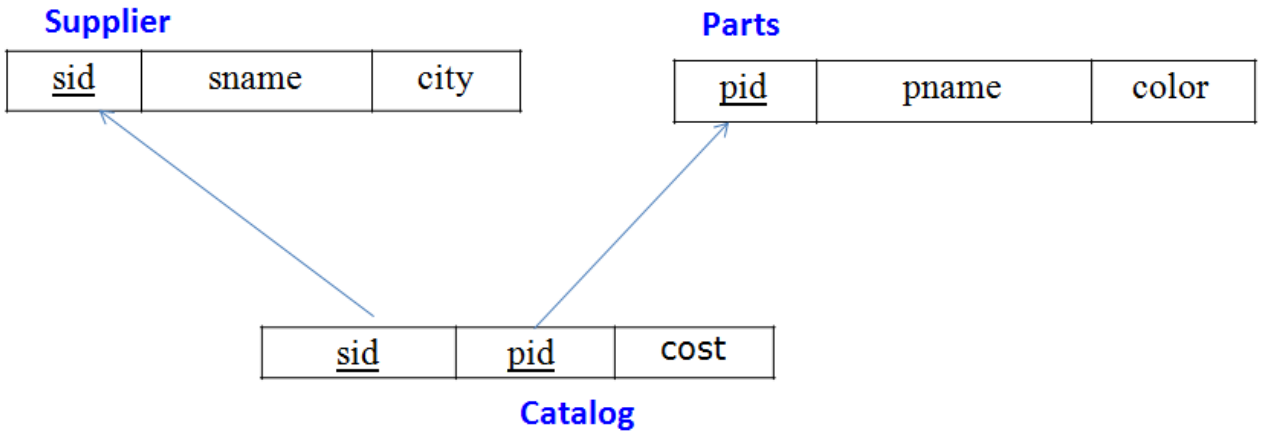
SECTION-4A

DBMS LAB-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:
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.

Schema Diagram



SUPPLIER TABLE

sid	sname	city
10001	Acme Widget	Bangalore
10002	Johns	Kolkata
10003	Vimal	Mumbai
10004	Reliance	Delhi
10005	Mahindra	Mumbai
NULL	NULL	NULL

PARTS TABLE

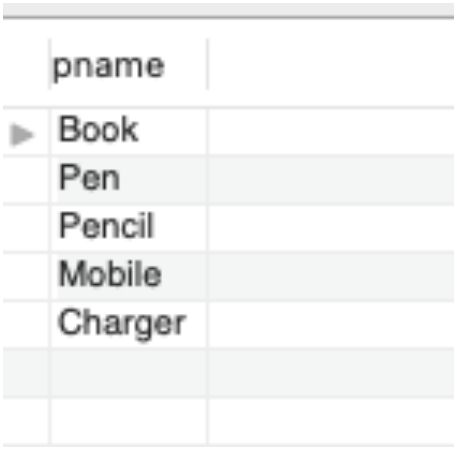
pid	pname	color
20001	Book	Red
20002	Pen	Red
20003	Pencil	Green
20004	Mobile	Green
20005	Charger	Black
NULL	NULL	NULL

CATALOG TABLE

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

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

```
SELECT DISTINCT P.pname
FROM PARTS P,CATALOG C
WHERE P.pid=C.pid;
```



pname
Book
Pen
Pencil
Mobile
Charger

Find the snames of suppliers who supply every part

```
SELECT s.sname
from SUPPLIERS s,CATALOG c
where s.sid=c.sid
group by c.sid
having count(distinct c.pid)=(select count(*) from PARTS);
```

sname
Acme Widget

Find the snames of suppliers who supply every red part.

```
SELECT distinct s.sname
from SUPPLIERS s,CATALOG c
where s.sid=c.sid and c.pid in(select pid from PARTS where color='red');
```

sname
Acme Widget
Johns

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

```
select pname
from PARTS p, SUPPLIERS s1, CATALOG c1
where p.pid=c1.pid and s1.sid=c1.sid and s1.sname='Acme Widget' and
not exists
(select *
from CATAlOG c2,SUPPLIERS s2
where c1.pid=c2.pid and s2.sname<>'Acme Widget' and s2.sid=c2.sid);
```

pname
Mobile
Charger

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)

```
select sid
from CATALOG c1
where cost >
(select avg(cost)
from CATALOG c2
where c1.pid=c2.pid);
```

sid
10002
10004

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

```
select pid, sname
from CATALOG c1,SUPPLIERS S
where c1.sid=s.sid and cost =
(select max(cost)
from CATALOG c2
where c1.pid=c2.pid);
```

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

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SECTION-4A

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).

STUDENT TABLE

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
NULL	NULL	NULL	NULL	NULL

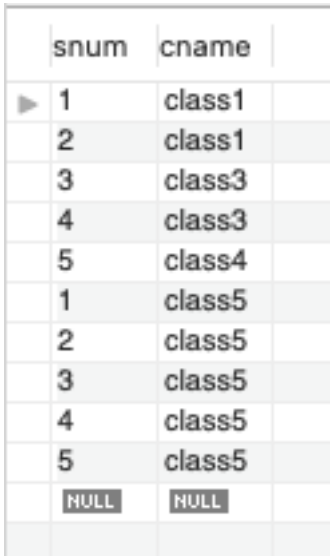
FACULTY TABLE

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

CLASS TABLE

cname	meets_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
NULL	NULL	NULL	NULL

ENROLLED TABLE



snum	cname
1	class1
2	class1
3	class3
4	class3
5	class4
1	class5
2	class5
3	class5
4	class5
5	class5
NULL	NULL

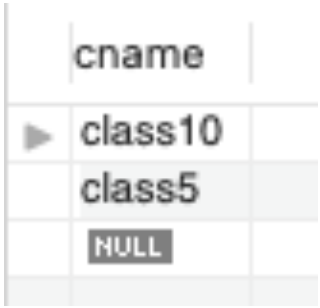
Find the names of all Juniors (level = JR) who are enrolled in a class taught by “name” select s.sname from Student s,Enrolled e,Class c

```
select sname
from student
where lvl='Jr' and snum in
(select snum
from enrolled e,class c,faculty f
where e.cname=c.cname and c.fid=f.fid and f.fname=‘Harish');
```

sname
Tom

Find the names of all classes that either meet in room R128 or have five or more Students enrolled.

```
select distinct c.cname

from class c

where c.room='R128' or cname in

(select cname

from enrolled

group by cname

having count(*)>=5);
```



cname
class10
class5
NULL

Find the names of all students who are enrolled in two classes that meet at the same time.

```
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.meets_at = C2.meets_at);
```

sname
Rahul

Find the names of faculty members who teach in every room in which some class is taught

```
select f.fname
from faculty f,class c
 where c.fid=f.fid
 group by c.fid
 having count(c.fid)=
 (select count(distinct room)
 from class);
```

fname
Shiva

Find the names of faculty members for whom the combined enrollment of the courses that they teach is less than five.

```
select fname
from faculty
where fid not in
(select f.fid
from faculty f,class c,enrolled e
where e.cname=c.cname and c.fid=f.fid
group by e.cname
having count(*)>=5);
```

fname
Harish
MV
Mira
Shiva

Find the names of students who are not enrolled in any class.

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

sname
Rita

For each age value that appears in Students, find the level value that appears most often.

```
select s.age,s.lvl
from student s
group by s.age
having s.lvl in
(select s1.lvl
from student s1
where s1.age=s.age
group by s1.age
having count(*)>=all(select s2.lvl from student s2
where s2.age=s1.age
group by s2.age));
```

age	lvl
19	Sr
20	Jr
21	Sr

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SECTION-4A

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.

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

2. 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.

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

4. 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.

5. Find the names of pilots certified for some Boeing aircraft.

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

7. 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.

FLIGHTS TABLE

FLNO	FFROM	TTO	DISTANCE	DEPARTS	ARRIVES	PRICE
101	Bangalore	Delhi	2500	07:15:31	12:15:31	5000
102	Bangalore	Lucknow	3000	07:15:31	11:15:31	6000
103	Lucknow	Delhi	500	12:15:31	17:15:31	3000
104	Bangalore	Frankfurt	8500	07:15:31	23:15:31	75000
105	Kolkata	Delhi	3400	07:15:31	09:15:31	7000
106	Delhi	Kolkata	3400	12:15:35	14:20:00	7000
107	Bangalore	Frankfurt	8000	07:15:31	22:15:31	60000
NULL	NULL	NULL	NULL	NULL	NULL	NULL

AIRCRAFT TABLE

AID	ANAME	CRUISINGRANGE
101	747	3000
102	Boeing	900
103	647	800
104	Dreamliner	10000
105	Boeing	3500
106	707	1500
107	Dream	12000
NULL	NULL	NULL

EMPLOYEES TABLE

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

CERITFIED TABLE

EID	AID
701	101
702	101
701	102
705	103
702	104
703	104
704	104
701	105
703	105
704	105
701	106
702	107
703	107
704	107
NULL	NULL

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

```
SELECT DISTINCT A.ANAME

FROM AIRCRAFT A,CERTIFIED C,EMPLOYEES E

WHERE A.AID=C.AID AND C.EID=E.EID AND SALARY>80000;
```

ANAME
747
Dreamliner
Dream
Boeing

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.

```
SELECT C.EID,MAX(A.CRUISINGRANGE)
FROM CERTIFIED C,AIRCRAFT A
WHERE C.AID=A.AID
GROUP BY C.EID
HAVING COUNT(*)>3;
```

EID	MAX(A.CRUISINGRANGE)
701	3500

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

```
SELECT ENAME
FROM EMPLOYEES
WHERE SALARY <(SELECT MIN(PRICE)
FROM FLIGHTS
WHERE FFROM="Bangalore" AND TTO=“Frankfurt");
```

ENAME
A
E

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.

```
SELECT A.ANAME,AVG(E.SALARY)
FROM CERTIFIED C,EMPLOYEES E,AIRCRAFT A
WHERE A.CRUISINGRANGE>1000 AND C.AID=A.AID AND C.EID=E.EID
GROUP BY A.ANAME;
```

ANAME	AVG(E.SALARY)
747	75000.0000
Dreamliner	113333.3333
Boeing	96666.6667
707	50000.0000
Dream	113333.3333

Find the names of pilots certified for some Boeing aircraft.

```
SELECT DISTINCT E.ENAME

FROM EMPLOYEES E,AIRCRAFT A,CERTIFIED C

WHERE E.EID=C.EID AND A.AID=C.AID AND A.ANAME=“Boeing";
```

ENAME
A
C
D

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

```
 SELECT A.AID
FROM AIRCRAFT A
WHERE A.CRUISINGRANGE>(SELECT MIN(DISTANCE) FROM FLIGHTS F WHERE
F.FFROM="Bangalore" AND F.TTO="Delhi");
```

AID
101
104
105
107
NULL

A customer wants to travel from bangalore to kolkata with no more than two changes of flight -- List the choice of departure times customer wants to arrive by 6 p.m.

```
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";
```

FFROM	TTO	ARRIVES
Bangalore	Delhi	12:15:31
Delhi	Kolkata	14:20:00