



**B.M.S. COLLEGE OF ENGINEERING**  
(Autonomous Institution under VTU)  
**BENGALURU-560019**

## **DBMS LAB RECORD**

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## Program 1: Insurance Database

```
CREATE DATABASE program1;
use program1;

create table person( driver_id varchar(10),name varchar(20),address
varchar(30),primary key(driver_id));
desc person;

create table car(reg_num varchar(10),model varchar(10),year int,primary
key(reg_num));
desc car;

create table accident(report_num int,accident_date date,location
varchar(20),primary key(report_num));
desc accident;

create table owns(driver_id varchar(10),reg_num varchar(10),primary
key(driver_id,reg_num),foreign key(driver_id) references
person(driver_id),foreign key(reg_num) references car(reg_num));
desc owns;

create table participated(driver_id varchar(10),reg_num varchar(10),report_num
int,damage_amount int,primary key(driver_id,reg_num,report_num),foreign
key(driver_id) references person(driver_id),foreign key(reg_num) references
car(reg_num),foreign key(report_num) references accident(report_num));
desc participated;

insert into person values('A01','Richard','Srinivas Nagar');
insert into person values('A02','Pradeep','Rajajinagar');
insert into person values('A03','Smith','Ashoknagar');
insert into person values('A04','Venu','N.R.Colony');
insert into person values('A05','John','Hanumanth Nagar');
commit;

select * from person;

insert into car values('KA031181','Lancer',1957);
insert into car values('KA041702','Audi',2005);
insert into car values('KA043408','Honda',2008);
insert into car values('KA052250','Indica',1990);
insert into car values('KA095477','Toyota',1998);
commit;
```

```

select * from car;

insert into accident values(11, '2001-01-03', 'Mysore Road');
insert into accident values(12, '2021-01-03', 'Southend Circle');
insert into accident values(13, '2020-03-03', ' Bulltemple Road');
insert into accident values(14, ' 2017-02-08', ' Mysore Road');
insert into accident values(15, '2004-03-05', 'Kanakpura Road');
commit;

select * from accident;

insert into owns values ('A01', 'KA052250');
insert into owns values ('A02', 'KA043408');
insert into owns values ('A03', 'KA031181');
insert into owns values ('A04', 'KA095477');
insert into owns values ('A05', 'KA041702')
commit;
insert into participated values ('A01', 'KA052250', 11, 25000);
insert into participated values ('A02', 'KA043408', 12, 50000);
insert into participated values ('A03', 'KA031181', 13, 25000);
insert into participated values ('A04', 'KA095477', 14, 3000);
insert into participated values ('A05', 'KA041702', 15, 5000);

select * from participated;

update participated set damage_amount = 500 where reg_num='KA031181';
insert into accident values(101, '2020-12-01', 'Xavier Road');
insert into participated values('A01', 'KA031181', 101, 1001);
commit;

select * from accident;
select * from participated;

insert into car values('KA01010', 'Accord', 2002);
insert into owns values('A02', 'KA01010');
insert into accident values(200, '2008-12-01', 'Pinto Road');
insert into participated values('A02', 'KA01010', 200, 500);

select * from car;
select * from owns;
select * from accident;
select * from participated;
select count(*) from accident where year(accident_date)=2008;
select count(*) from participated where reg_num in ( select reg_num from car
where model="Accord");

```

## Output:

Desc person;

Field	Type	Null	Key	Default	Extra
driver_id	varchar(10)	NO	PRI	NULL	
name	varchar(10)	YES		NULL	
address	varchar(10)	YES		NULL	

Desc car;

Field	Type	Null	Key	Default	Extra
regno	varchar(10)	NO	PRI	NULL	
model	varchar(10)	YES		NULL	
year	int	YES		NULL	

Desc accident;

Field	Type	Null	Key	Default	Extra
report_num	int	NO	PRI	NULL	
accident_date	date	YES		NULL	
location	varchar(20)	YES		NULL	

Desc owns;

driver_id	reg_num
A03	KA031181
A05	KA041702
A02	KA043408
A01	KA052250
A04	KA095477
NULL	NULL

Desc participated;

driver_id	reg_num	report_num	damage_amount
A01	KA052250	11	10000
A02	KA043408	12	50000
A03	KA031181	13	25000
A04	KA095477	14	3000
A05	KA041702	15	5000
NULL	NULL	NULL	NULL

Select \* from person;

driver_id	name	address
A01	Richard	Srinivas Nagar
A02	Pradeep	Rajajinagar
A03	Smith	Ashoknagar
A04	Venu	N.R.Colony
A05	John	Hanumanth Nagar
NULL	NULL	NULL

Select \* from car;

reg_num	model	year
KA01010	Accord	2002
KA031181	Lancer	1957
KA041702	Audi	2005
KA043408	Honda	2008
KA052250	Indica	1990
KA095477	Toyota	1998
NULL	NULL	NULL

Select \* from accident;

report_num	accident_date	location
11	2001-01-03	Mysore Road
12	2002-02-04	Southend Circle
13	2021-01-03	Bulltemple Road
14	2017-02-08	Mysore Road
15	2004-03-05	Kanakpura Road
16	2020-12-01	Xavier Road
200	2008-12-01	Pinto Road
NULL	NULL	NULL

Select \* from owns;

driver_id	reg_num
A02	KA01010
A03	KA031181
A05	KA041702
A02	KA043408
A01	KA052250
A04	KA095477
NULL	NULL

Select \* from participated;

driver_id	reg_num	report_num	damage_amount
A01	KA052250	11	25000
A01	KA052250	16	1001
A02	KA01010	200	500
A02	KA043408	12	50000
A03	KA031181	13	25000
A04	KA095477	14	3000
A05	KA041702	15	5000
NULL	NULL	NULL	NULL

## Program 2: Banking Enterprise Database

```
create database bank;
use bank;

create table branch (branch_name varchar(25),branch_city varchar(15),assets
int,primary key (branch_name));

create table bank_account (accno int,branch_name varchar(25), balance int,primary
key (accno),foreign key (branch_name) references branch(branch_name));

create table bank_customer (customer_name varchar(10),customer_street
varchar(25),customer_city varchar(15),primary key (customer_name));

create table depositor (customer_name varchar(10),accno int,primary
key(customer_name, accno),foreign key (customer_name) references
bank_customer(customer_name),foreign key (accno) references bank_account(accno));

create table loan (loan_number int,branch_name varchar(25),amount int,primary key
(loan_number),foreign key (branch_name) references branch(branch_name));

insert into branch values('SBI_Chamrajpet', 'Bangalore', 50000);
insert into branch values('SBI_ResidencyRoad', 'Bangalore', 10000);
insert into branch values('SBI_ShivajiRoad', 'Bombay', 20000);
insert into branch values('SBI_ParliamentRoad', 'Delhi', 10000);
insert into branch values('SBI_Jantarmantar', 'Delhi', 20000);
commit;

insert into bank_account values(1, 'SBI_Chamrajpet', 2000);
insert into bank_account values(2, 'SBI_ResidencyRoad', 5000);
insert into bank_account values(3, 'SBI_ShivajiRoad', 6000);
insert into bank_account values(4, 'SBI_ParliamentRoad', 9000);
insert into bank_account values(5, 'SBI_Jantarmantar', 8000);
insert into bank_account values(6, 'SBI_ShivajiRoad', 4000);
insert into bank_account values(8, 'SBI_ResidencyRoad', 4000);
insert into bank_account values(9, 'SBI_ParliamentRoad', 3000);
insert into bank_account values(10, 'SBI_ResidencyRoad', 5000);
insert into bank_account values(11, 'SBI_Jantarmantar', 2000);
commit;

insert into bank_customer values ('Avinash', 'Bull_Temple_Road', 'Bangalore');
insert into bank_customer values ('Dinesh', 'Bannerghatta_Road', 'Bangalore');
insert into bank_customer values ('Mohan', 'National_College_Road', 'Bangalore');
insert into bank_customer values ('Nikhil', 'Akbar_Road', 'Delhi');
```

```
insert into bank_customer values ('Ravi', 'Prithviraj_Road', 'Delhi');
commit;
```

```
insert into depositer values('Avinash', 1);
insert into depositer values('Dinesh', 2);
insert into depositer values('Nikhil', 4);
insert into depositer values('Ravi', 5);
insert into depositer values('Avinash', 8);
insert into depositer values('Nikhil', 9);
insert into depositer values('Dinesh', 10);
insert into depositer values('Nikhil', 11);
commit;
```

```
insert into loan values(1, 'SBI_Chamrajpet', 1000);
insert into loan values(2, 'SBI_ResidencyRoad', 2000);
insert into loan values(3, 'SBI_ShivajiRoad', 3000);
insert into loan values(4, 'SBI_ParliamentRoad', 4000);
insert into loan values(5, 'SBI_Jantarmantar', 5000);
commit;
```

```
select * from branch;
select * from bank_account;
select * from bank_customer;
select * from depositer;
select * from loan;
```

```
select distinct c.customer_name from bank_customer c, bank_account b where
exists(select d.customer_name, count(d.customer_name) from depositer
d, bank_account ba where ba.accno = d.accno and
c.customer_name = d.customer_name and ba.branch_name = 'SBI_ResidencyRoad' group
by d.customer_name having count(d.customer_name) >= 2);
```

```
select d.customer_name from depositer d, branch b, bank_account a where
b.branch_name = a.branch_name
AND a.accno = d.accno
and 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 bank_account where branch_name in (select branch_name from branch
where branch_city = 'Bombay');
```

```
select * from bank_account;
```



## Output:

Select \* from branch;

branch_name	branch_city	assets
SBI_Chamrajpet	Bangalore	50000
SBI_Jantarantar	Delhi	20000
SBI_ParliamentRoad	Delhi	10000
SBI_ResidencyRoad	Bangalore	10000
SBI_ShivajiRoad	Bombay	20000
NULL	NULL	NULL

Select \* from bank\_account;

accno	branch_name	balance
1	SBI_Chamrajpet	2000
2	SBI_ResidencyRoad	5000
4	SBI_ParliamentRoad	9000
5	SBI_Jantarantar	8000
8	SBI_ResidencyRoad	4000
9	SBI_ParliamentRoad	3000
10	SBI_ResidencyRoad	5000
11	SBI_Jantarantar	2000
NULL	NULL	NULL

Select \* from bank\_customer;

customer_name	customer_street	customer_city
Avinash	Bull_Temple_Road	Bangalore
Dinesh	Bannergatta_Road	Bangalore
Mohan	National_College_Road	Bangalore
Nikhil	Akbar_Road	Delhi
Ravi	Prithviraj_Road	Delhi
NULL	NULL	NULL

Select \* from depositer;

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

Select \* from loan;

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

Query 3:

	customer_name
▶	Dinesh

Query 4:

	customer_name
▶	Nikhil

Query 5:

accno	branch_name	balance
1	SBI_Chamrajpet	2000
2	SBI_ResidencyRoad	5000
4	SBI_ParliamentRoad	9000
5	SBI_Jantarmanatar	8000
8	SBI_ResidencyRoad	4000
9	SBI_ParliamentRoad	3000
10	SBI_ResidencyRoad	5000
11	SBI_Jantarmanatar	2000
NULL	NULL	NULL

## Program 3: Supplier Database

```
create database supplier;
use supplier;

create table SUPPLIERS(sid integer,sname varchar(20),address varchar(40),primary
key(sid));
INSERT INTO `supplier`.`suppliers` (`sid`, `sname`, `address`) VALUES ('10001',
'Acme Widget', 'Bangalore');
INSERT INTO `supplier`.`suppliers` (`sid`, `sname`, `address`) VALUES ('10002',
'Johns', 'Kolkata');
INSERT INTO `supplier`.`suppliers` (`sid`, `sname`, `address`) VALUES ('10003',
'Vimal', 'Mumbai');
INSERT INTO `supplier`.`suppliers` (`sid`, `sname`, `address`) VALUES ('10004',
'Reliance', 'Delhi');
commit;

select* from SUPPLIERS;

create table PARTS(pid integer,pname varchar(20),color varchar(30),primary
key(pid));

INSERT INTO `supplier`.`parts` (`pid`, `pname`, `color`) VALUES ('20001', 'Book',
'Red');
INSERT INTO `supplier`.`parts` (`pid`, `pname`, `color`) VALUES ('20002', 'Pen',
'Red');
INSERT INTO `supplier`.`parts` (`pid`, `pname`, `color`) VALUES ('20003',
'Pencil', 'Green');
INSERT INTO `supplier`.`parts` (`pid`, `pname`, `color`) VALUES ('20004',
'Mobile', 'Green');
INSERT INTO `supplier`.`parts` (`pid`, `pname`, `color`) VALUES ('20005',
'Charger', 'Black');
commit;

select* from PART;

create table CATALOG(sid integer,pid integer,foreign key(sid) references
SUPPLIERS(sid),foreign key(pid) references PARTS(pid),
cost integer,primary key(sid,pid));

INSERT INTO `supplier`.`catalog` (`sid`, `pid`, `cost`) VALUES ('10001', '20001',
'10');
INSERT INTO `supplier`.`catalog` (`sid`, `pid`, `cost`) VALUES ('10001', '20002',
'10');
```

```

INSERT INTO `supplier`.`catalog` (`sid`, `pid`, `cost`) VALUES ('10001', '20003',
'30');
INSERT INTO `supplier`.`catalog` (`sid`, `pid`, `cost`) VALUES ('10001', '20004',
'10');
INSERT INTO `supplier`.`catalog` (`sid`, `pid`, `cost`) VALUES ('10001', '20005',
'10');
INSERT INTO `supplier`.`catalog` (`sid`, `pid`, `cost`) VALUES ('10002', '20001',
'10');
INSERT INTO `supplier`.`catalog` (`sid`, `pid`, `cost`) VALUES ('10002', '20002',
'20');
INSERT INTO `supplier`.`catalog` (`sid`, `pid`, `cost`) VALUES ('10003', '20003',
'30');
INSERT INTO `supplier`.`catalog` (`sid`, `pid`, `cost`) VALUES ('10004', '20003',
'40');
commit;

```

```

select* from CATALOG;

```

```

-- Query 1:-

```

```

SELECT DISTINCT P.pname
FROM Parts P, Catalog C
WHERE P.pid = C.pid;

```

```

-- Query 2:-

```

```

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));

```

```

-- Query 3:-

```

```

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)));

```

```

-- Query 4:-

```

```

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');

```

```

-- Query 5:-

```

```

SELECT DISTINCT C.sid FROM Catalog C
WHERE C.cost > ( SELECT AVG (C1.cost)
FROM Catalog C1
WHERE C1.pid = C.pid );

```

```
-- Query 6:-
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:

Select \* from suppliers;

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

Select \* from part;

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

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
NULL	NULL	NULL

Query 1:

pname
Book
Pen
Pencil
Mobile
Charger

Query 2:

sname
Acme Widget

Query 3:

sname
Acme Widget
Johns

Query 4:

pname
Mobile
Charger

Query 5:

sid
10002
10004

Query 6:

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

## Program 4: Student Faculty Database

```
CREATE DATABASE student_faculty;
USE student_faculty;
CREATE TABLE student(
    snum INT,
    sname VARCHAR(10),
    major VARCHAR(2),
    lvl VARCHAR(2),
    age INT, primary key(snum));

CREATE TABLE faculty(
    fid INT,fname VARCHAR(20),
    deptid INT,
    PRIMARY KEY(fid));

CREATE TABLE class(
    cname VARCHAR(20),
    metts_at TIMESTAMP,
    room VARCHAR(10),
    fid INT,
    PRIMARY KEY(cname),
    FOREIGN KEY(fid) REFERENCES faculty(fid));

CREATE TABLE enrolled(
    snum INT,
    cname VARCHAR(20),
    PRIMARY KEY(snum,cname),
    FOREIGN KEY(snum) REFERENCES student(snum),
    FOREIGN KEY(cname) REFERENCES class(cname));

INSERT INTO STUDENT VALUES(1, 'jhon', 'CS', 'Sr', 19);
INSERT INTO STUDENT VALUES(2, 'Smith', 'CS', 'Jr', 20);
INSERT INTO STUDENT VALUES(3 , 'Jacob', 'CV', 'Sr', 20);
INSERT INTO STUDENT VALUES(4, 'Tom ', 'CS', 'Jr', 20);
INSERT INTO STUDENT VALUES(5, 'Rahul', 'CS', 'Jr', 20);
INSERT INTO STUDENT VALUES(6, 'Rita', 'CS', 'Sr', 21);
commit;

INSERT INTO FACULTY VALUES(11, 'Harish', 1000);
INSERT INTO FACULTY VALUES(12, 'MV', 1000);
INSERT INTO FACULTY VALUES(13 , 'Mira', 1001);
INSERT INTO FACULTY VALUES(14, 'Shiva', 1002);
```



```
INSERT INTO FACULTY VALUES(15, 'Nupur', 1000);
commit;
```

```
insert into class values('class1', '12/11/15 10:15:16', 'R1', 14);
insert into class values('class10', '12/11/15 10:15:16', 'R128', 14);
insert into class values('class2', '12/11/15 10:15:20', 'R2', 12);
insert into class values('class3', '12/11/15 10:15:25', 'R3', 11);
insert into class values('class4', '12/11/15 20:15:20', 'R4', 14);
insert into class values('class5', '12/11/15 20:15:20', 'R3', 15);
insert into class values('class6', '12/11/15 13:20:20', 'R2', 14);
insert into class values('class7', '12/11/15 10:10:10', 'R3', 14);
commit;
```

```
insert into enrolled values(1, 'class1');
insert into enrolled values(2, 'class1');
insert into enrolled values(3, 'class3');
insert into enrolled values(4, 'class3');
insert into enrolled values(5, 'class4');
insert into enrolled values(1, 'class5');
insert into enrolled values(2, 'class5');
insert into enrolled values(3, 'class5');
insert into enrolled values(4, 'class5');
insert into enrolled values(5, 'class5');
commit;
```

-- Query 1:-

```
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';
```

-- Query 2:-

```
SELECT DISTINCT cname FROM class WHERE room='R128' OR cname IN (SELECT e.cname
FROM enrolled e GROUP BY e.cname HAVING COUNT(*)>=5);
```

-- Query 3:-

```
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);
```

-- Query 4:-

```

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)
);

```

-- Query 5:-

```

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);

```

-- Query 6:-

```

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

```

-- Query 7:-

```

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;

```

## Output:

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
NULL	NULL	NULL	NULL	NULL

Select \* from faculty;

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

Select \* from class;

cname	metts_at	room	fid
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
class3	2012-11-15 10:15:25	R3	11
class2	2012-11-15 10:15:20	R2	12
class1	2012-11-15 10:15:16	R1	14
class10	2012-11-15 10:15:16	R128	14
class7	2012-11-15 10:10:10	R3	14
NULL	NULL	NULL	NULL

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
NULL	NULL

Query 1:

	Sname
▶	Tom

Query 2:

	cname
▶	class10
	class5
*	NULL

Query 3:

	sname
▶	Rahul

Query 4:

	fname	fid
▶	Shiva	14
*	NULL	NULL

Query 5:

	fname
▶	Harish
	MV
	Mira
	Shiva

Query 6:

	sname
▶	Rita

Query 7:

	age	lvl
▶	19	Sr
	20	Jr
	21	Sr

## Program 5: Airline Flight Database

```
create database flightdb;
use flightdb;

create table flights(
    flno int,
    fromplace varchar(15),
    toplace varchar(15),
    distance int,
    departs datetime,
    arrives datetime,
    price int,
    primary key (flno)
);
desc flights;
create table aircraft(
    aid int,
    aname varchar(15),
    cruisingrange int,
    primary key (aid)
);
desc aircraft;
create table employees (
    eid int,
    ename varchar(15),
    salary int,
    primary key (eid)
);
desc employees;
create table certified (
    eid int,
    aid int,
    foreign key (eid) references employees(eid),
    foreign key (aid) references aircraft(aid)
);
desc certified;
insert into flights values(101, 'Bangalore', 'Delhi', 2500, '2005-05-13
07:15:31', '2005-05-13 18:15:31', 5000);
insert into flights values(102, 'Bangalore', 'Lucknow', 3000, '2013-05-05
07:15:31', '2013-05-05 11:15:31', 6000);
insert into flights values(103, 'Lucknow', 'Delhi', 500, '2013-05-05 12:15:31',
'2013-05-05 17:15:31', 3000);
```

```
insert into flights values(107, 'Bangalore', 'Frankfurt', 8000, '2013-05-05
07:15:31', '2013-05-05 22:15:31', 60000);
insert into flights values(104, 'Bangalore', 'Frankfurt', 8500, '2013-05-05
07:15:31', '2013-05-05 23:15:31', 75000);
insert into flights values(105, 'Kolkata', 'Delhi', 3400, '2013-05-05 07:15:31',
'2013-05-05 09:15:31', 7000);
insert into flights values(106, 'Bangalore', 'Kolkata', 1000, '2013-05-05
01:15:30', '2013-05-05 09:20:30', 10000);
insert into flights values(108, 'Lucknow', 'Kolkata', 1000, '2013-05-05
11:30:30', '2013-05-05 15:20:30', 10000);
```

```
commit;
```

```
select * from flights;
```

```
insert into aircraft values(101, '747', 3000);
insert into aircraft values(102, 'Boeing', 900);
insert into aircraft values(103, '647', 800);
insert into aircraft values(104, 'Dreamliner', 10000);
insert into aircraft values(105, 'Boeing', 3500);
insert into aircraft values(106, '707', 1500);
insert into aircraft values(107, 'Dream', 120000);
insert into aircraft values(108, '707', 760);
insert into aircraft values(109, '747', 1000);
commit;
```

```
select * from aircraft;
```

```
insert into employees values(701, 'A', 50000);
insert into employees values(702, 'B', 100000);
insert into employees values(703, 'C', 150000);
insert into employees values(704, 'D', 90000);
insert into employees values(705, 'E', 40000);
insert into employees values(706, 'F', 60000);
insert into employees values(707, 'G', 90000);
commit;
```

```
select * from employees;
```

```
insert into certified values(701, 101);
insert into certified values(701, 102);
insert into certified values(701, 106);
insert into certified values(701, 105);
insert into certified values(702, 104);
insert into certified values(703, 104);
```

```

insert into certified values(704, 104);
insert into certified values(702, 107);
insert into certified values(703, 107);
insert into certified values(704, 107);
insert into certified values(702, 101);
insert into certified values(702, 108);
insert into certified values(701, 109);
commit;

select * from certified;

-- Query 1:-
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));

-- Query 2:-
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;

-- Query 3:-
select ename from employees where salary < (select min(price) from flights where
fromplace='Bangalore' and toplace='Frankfurt');

-- Query 4:-
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;

-- Query 5:-
select ename from employees where eid in(select eid from certified where aid
in(select aid from aircraft where aname = 'Boeing'));

-- Query 6:-
select aname from aircraft where cruisingrange > any (select distance from
flights where fromplace='Bangalore' and toplace='Delhi');

-- Query 7:-
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));

```

## Output:

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
NULL	NULL	NULL	NULL	NULL	NULL	NULL

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
NULL	NULL	NULL



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
NULL	NULL	NULL

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

Query 1:

aname
747
Dreamliner
Dream
707

Query 2:

max(a.cruisingrange)	eid
3500	701
120000	702

Query 3:

ename
A
E

Query 4:

avg(e.salary)	aid
75000.0000	101
113333.3333	104
50000.0000	105
50000.0000	106
113333.3333	107

Query 5:

	ename
▶	A

Query 6:

aname
747
Dreamliner
Boeing
Dream

Query 7:

fno	departs
102	2013-05-05 07:15:31
106	2013-05-05 01:15:30

## Program 6: Order Database

```
create database orderdb;
use orderdb;

create table salesman (
    salesman_id int(4),
    name varchar (20),
    city varchar (20),
    commission varchar (20),
    primary key (salesman_id)
);
desc salesman;
create table customer1 (
    customer_id int(4),
    cust_name varchar (20),
    city varchar (20),
    grade int (3),
    salesman_id int(4),
    primary key (customer_id),
    foreign key (salesman_id) references salesman(salesman_id) on delete set null
);
desc customer1;
create table orders (
    ord_no int (5),
    purchase_amt int (10),
    ord_date date,
    customer_id int(4),
    salesman_id int(4),
    primary key (ord_no),
    foreign key (customer_id) references customer1 (customer_id) on delete cascade,
    foreign key (salesman_id) references salesman (salesman_id) on delete cascade
);
desc orders;

insert into salesman values (1000, 'john', 'bangalore', '25 %');
insert into salesman values (2000, 'ravi', 'bangalore', '20 %');
insert into salesman values (3000, 'kumar', 'mysore', '15 %');
insert into salesman values (4000, 'smith', 'delhi', '30 %');
insert into salesman values (5000, 'harsha', 'hydrabad', '15 %');
select * from salesman;
```

```

insert into customer1 values (10, 'preethi', 'bangalore', 100, 1000);
insert into customer1 values (11, 'vivek', 'mangalore', 300, 1000);
insert into customer1 values (12, 'bhaskar', 'chennai', 400, 2000);
insert into customer1 values (13, 'chethan', 'bangalore', 200, 2000);
insert into customer1 values (14, 'mamatha', 'bangalore', 400, 3000);
select * from customer1;

```

```

insert into orders values (50, 5000, '04-06-17', 10, 1000);
insert into orders values (51, 450, '20-01-17', 10, 2000);
insert into orders values (52, 1000, '24-02-17', 13, 2000);
insert into orders values (53, 3500, '13-04-17', 14, 3000);
insert into orders values (54, 550, '09-03-17', 12, 2000);
select * from orders;

```

-- Query 1

```

select grade, count(distinct customer_id)
from customer1
group by grade
having grade > (select avg(grade)
from customer1
where city='bangalore'
);

```

-- Query 2

```

select salesman_id, name
from salesman a
where 1 < (select count(*)
from customer1
where salesman_id=a.salesman_id
);

```

-- Query 3

```

select salesman.salesman_id, name, cust_name, commission
from salesman, customer1
where salesman.city = customer1.city
union
select salesman_id, name, 'no match', commission
from salesman
where not city = any
(select city from customer1)
order by 2 desc;

```

--Query 4

```
create view highsalesman as
select b.ord_date, a.salesman_id, a.name
from salesman a, orders b
where a.salesman_id = b.salesman_id
and b.purchase_amt=(select max(purchase_amt)
from orders c
where c.ord_date = b.ord_date
);
select * from highsalesman;
```

-- Query 5

```
delete from salesman
where salesman_id=1000;
select * from salesman;
```

## Output:

Select \* from salesman;

	salesman_id	name	city	commission
▶	1000	john	bangalore	25 %
	2000	ravi	bangalore	20 %
	3000	kumar	mysore	15 %
	4000	smith	delhi	30 %
	5000	harsha	hydrabad	15 %

Select \* from customer1;

	customer_id	cust_name	city	grade	salesman_id
▶	10	preethi	bangalore	100	1000
	11	vivek	mangalore	300	1000
	12	bhaskar	chennai	400	2000
	13	chethan	bangalore	200	2000
	14	mamatha	bangalore	400	3000

Select \* from orders;

	ord_no	purchase_amt	ord_date	customer_id	salesman_id
▶	50	5000	2004-06-17	10	1000
	51	450	2020-01-17	10	2000
	52	1000	2024-02-17	13	2000
	53	3500	2013-04-17	14	3000
	54	550	2009-03-17	12	2000
*	NULL	NULL	NULL	NULL	NULL

Query 1:

	grade	count(distinct customer_id)
▶	300	1
	400	2

Query 2:

	salesman_id	name
▶	1000	john
	2000	ravi
*	NULL	NULL

Query 3:

	salesman_id	name	cust_name	commission
▶	4000	smith	no match	30 %
	2000	ravi	preethi	20 %
	2000	ravi	chethan	20 %
	2000	ravi	mamatha	20 %
	3000	kumar	no match	15 %
	1000	john	preethi	25 %
	1000	john	chethan	25 %
	1000	john	mamatha	25 %
	5000	harsha	no match	15 %

Query 4:

	ord_date	salesman_id	name
▶	2004-06-17	1000	john
	2009-03-17	2000	ravi
	2024-02-17	2000	ravi
	2020-01-17	2000	ravi
	2013-04-17	3000	kumar

Query 5:

	salesman_id	name	city	commission
▶	2000	ravi	bangalore	20 %
	3000	kumar	mysore	15 %
	4000	smith	delhi	30 %
	5000	harsha	hydrabad	15 %
*	NULL	NULL	NULL	NULL

## Program 7: Book Database

```
create database bookdb;
use bookdb;

create table publisher (
    name varchar (20) primary key,
    phone integer,
    address varchar (20)
);
desc publisher;

create table book (
    book_id integer primary key,
    title varchar (20),
    pub_year varchar (20),
    publisher_name varchar (20),
    foreign key (publisher_name) references publisher (name) on delete cascade
);
desc book;

create table book_authors (
    author_name varchar (20),
    book_id integer,
    foreign key (book_id) references book (book_id) on delete cascade,
    primary key (book_id, author_name)
);
desc book_authors;

create table library_branch (
    branch_id integer primary key,
    branch_name varchar (50),
    address varchar (50)
);
desc library_branch;
```



```
create table book_copies (  
no_of_copies integer,  
book_id integer,  
branch_id integer,  
foreign key (book_id) references book (book_id) on delete cascade,  
foreign key (branch_id) references library_branch (branch_id) on delete cascade,  
primary key (book_id, branch_id)  
);  
desc book_copies;
```

```
create table card (  
card_no integer primary key  
);  
desc card;
```

```
create table book_lending (  
date_out date,  
due_date date,  
book_id integer,  
branch_id integer,  
card_no integer,  
foreign key (book_id) references book (book_id) on delete cascade,  
foreign key (branch_id) references library_branch (branch_id) on delete cascade,  
foreign key (card_no) references card (card_no) on delete cascade,  
primary key (book_id, branch_id, card_no)  
);  
desc book_lending;
```

```
insert into publisher values ('mcgraw-hill', 99890, 'bangalore');  
insert into publisher values ('pearson', 98890, 'newdelhi');  
insert into publisher values ('random house', 74556, 'hydrabad');  
insert into publisher values ('hachette livre', 897086, 'chenai');  
insert into publisher values ('grupo planeta', 77561, 'bangalore');
```

```
select * from publisher;
```

```
insert into book values (1, 'dbms', '01-2017', 'mcgraw-hill');  
insert into book values (2, 'adbms', '06-2016', 'mcgraw-hill');  
insert into book values (3, 'cn', '09-2016', 'pearson');  
insert into book values (4, 'cg', '09-2015', 'grupo planeta');  
insert into book values (5, 'os', '05-2016', 'pearson');  
select * from book;
```

```
insert into book_authors values ('navathe', 1);  
insert into book_authors values ('navathe', 2);
```

```
insert into book_authors values ('tanenbaum', 3);
insert into book_authors values ('edward angel', 4);
insert into book_authors values ('galvin', 5);
select * from book_authors;
```

```
insert into library_branch values (10, 'rr nagar', 'bangalore');
insert into library_branch values (11, 'rnsit', 'bangalore');
insert into library_branch values (12, 'rajaji nagar', 'bangalore');
insert into library_branch values (13, 'nitte', 'mangalore');
insert into library_branch values (14, 'manipal', 'udupi');
select * from library_branch;
```

```
insert into book_copies values (10, 1, 10);
insert into book_copies values (5, 1, 11);
insert into book_copies values (2, 2, 12);
insert into book_copies values (5, 2, 13);
insert into book_copies values (7, 3, 14);
insert into book_copies values (1, 5, 10);
insert into book_copies values (3, 4, 11);
select * from book_copies;
```

```
insert into card values (100);
insert into card values (101);
insert into card values (102);
insert into card values (103);
insert into card values (104);
select * from card;
```

```
insert into book_lending values ('01-01-17', '01-06-17', 1, 10, 101);
insert into book_lending values ('11-01-17', '11-03-17', 3, 14, 101);
insert into book_lending values ('21-02-17', '21-04-17', 2, 13, 101);
insert into book_lending values ('15-03-17', '15-07-17', 4, 11, 101);
insert into book_lending values ('12-08-17', '12-08-17', 1, 11, 104);
select * from book_lending;
```

-- Query 1

```
select b.book_id, b.title, b.pub_year, b.publisher_name, bc.no_of_copies,  
ba.author_name, lb.branch_name from book b, book_authors ba,  
library_branch lb, book_copies bc where b.book_id = ba.book_id and b.book_id =  
bc.book_id and lb.branch_id = bc.branch_id;
```

-- Query 2

```
select card_no from book_lending where year(date_out) >17 and month(date_out)<7  
group by card_no having count(card_no) >2 ;
```

-- Query 3

```
delete from book where book_id = 3;  
select * from book;  
select * from book_authors;  
select * from book_copies;  
select * from book_lending;
```

-- Query 4

```
select * from book order by substring(pub_year, 4, 4);  
-- select b1.book_id, b1.title, b1.pub_year  
-- from book b1  
-- inner join book b2 on substring(b1.pub_year, 4, 4) = substring(b2.pub_year, 4,  
4) and b1.book_id <> b2.book_id;
```

```
create view q4_view as select pub_year from book;  
select * from q4_view;
```

-- Query 5

```
create view q5_view as select b.book_id, b.title, bc.no_of_copies from book b,  
book_copies bc where b.book_id = bc.book_id;  
select * from q5_view;
```

## Output:

Select \* from publisher;

	name	phone	address
▶	grupo planeta	77561	bangalore
	hachette livre	897086	chenai
	mcgraw-hill	99890	bangalore
	pearson	98890	newdelhi
	random house	74556	hydrabad
*	NULL	NULL	NULL

Select \* from book;

	book_id	title	pub_year	publisher_name
▶	1	dbms	01-2017	mcgraw-hill
	2	adbms	06-2016	mcgraw-hill
	3	cn	09-2016	pearson
	4	cg	09-2015	grupo planeta
	5	os	05-2016	pearson
*	NULL	NULL	NULL	NULL

Select \* from book\_authors;

	author_name	book_id
▶	navathe	1
	navathe	2
	tanenbaum	3
	edward angel	4
	galvin	5
*	NULL	NULL

Select \* from library\_branch;

	branch_id	branch_name	address
▶	10	rr nagar	bangalore
	11	rnsit	bangalore
	12	rajaji nagar	bangalore
	13	nitte	mangalore
	14	manipal	udupi
*	NULL	NULL	NULL

Select \* from book\_copies;

	no_of_copies	book_id	branch_id
▶	10	1	10
	5	1	11
	2	2	12
	5	2	13
	7	3	14
	3	4	11
	1	5	10
*	NULL	NULL	NULL

Select \* from card;

	card_no
▶	100
	101
	102
	103
	104
*	NULL

Select \* from book\_lending;

	date_out	due_date	book_id	branch_id	card_no
▶	2001-01-17	2001-06-17	1	10	101
	2012-08-17	2012-08-17	1	11	104
	2021-02-17	2021-04-17	2	13	101
	2011-01-17	2011-03-17	3	14	101
	2015-03-17	2015-07-17	4	11	101
*	NULL	NULL	NULL	NULL	NULL

Query 1:

	book_id	title	pub_year	publisher_name	no_of_copies	author_name	branch_name
▶	1	dbms	01-2017	mcgraw-hill	10	navathe	rr nagar
	1	dbms	01-2017	mcgraw-hill	5	navathe	rnsit
	2	adbms	06-2016	mcgraw-hill	2	navathe	rajaji nagar
	2	adbms	06-2016	mcgraw-hill	5	navathe	nitte
	3	cn	09-2016	pearson	7	tanenbaum	manipal
	4	cg	09-2015	grupo planeta	3	edward angel	rnsit
	5	os	05-2016	pearson	1	galvin	rr nagar

Query 2:

	card_no
▶	101

Query 3:

Select \* from book;

	book_id	title	pub_year	publisher_name
▶	1	dbms	01-2017	mcgraw-hill
	2	adbms	06-2016	mcgraw-hill
	4	cg	09-2015	grupo planeta
	5	os	05-2016	pearson
*	NULL	NULL	NULL	NULL

Select \* from book\_authors;

	author_name	book_id
▶	navathe	1
	navathe	2
	edward angel	4
	galvin	5
*	NULL	NULL

Select \* from book\_copies;

	no_of_copies	book_id	branch_id
▶	10	1	10
	5	1	11
	2	2	12
	5	2	13
	3	4	11
	1	5	10
*	NULL	NULL	NULL

Select \* from book\_lending;

	date_out	due_date	book_id	branch_id	card_no
▶	2001-01-17	2001-06-17	1	10	101
	2012-08-17	2012-08-17	1	11	104
	2021-02-17	2021-04-17	2	13	101
	2015-03-17	2015-07-17	4	11	101
*	NULL	NULL	NULL	NULL	NULL

Query 4:

	book_id	title	pub_year	publisher_name
▶	4	cg	09-2015	grupo planeta
	2	adbms	06-2016	mcgraw-hill
	5	os	05-2016	pearson
	1	dbms	01-2017	mcgraw-hill
*	NULL	NULL	NULL	NULL

Select \* from q4\_view;

	pub_year
▶	01-2017
	06-2016
	09-2015
	05-2016

Query 5:

select \* from q5\_view;

	book_id	title	no_of_copies
▶	1	dbms	10
	1	dbms	5
	2	adbms	2
	2	adbms	5
	4	cg	3
	5	os	1

## Program 8: Student Enrollment Database

```
create database student_enroll;
use student_enroll;

create table student(
    regno varchar(15),
    name varchar(20),
    major varchar(20),
    bdate date,
    primary key(regno));
desc student;

create table course(
    courseno int,
    cname varchar(20),
    dept varchar(20),
    primary key(courseno));
desc course;

create table enroll(
    regno varchar(15),
    courseno int,
    sem int,
    marks int,
    primary key(regno,courseno),
    foreign key(regno) references student(regno),
    foreign key(courseno) references course(courseno));
desc enroll;

create table textbook(
    book_isbn int,
    book_title varchar(20),
    publisher varchar(20),
    author varchar(20),
    primary key(book_isbn));
desc textbook;

create table book_adoption(
    courseno int,
    sem int,
    book_isbn int,
    primary key(courseno,book_isbn),
    foreign key(courseno) references course(courseno),
```



```
foreign key(book_isbn) references textbook(book_isbn));
desc book_adoption;
```

```
insert into student values('1BM11CS001','A','Sr','19931230');
insert into student values('1BM11CS002','B','Sr','19930924');
insert into student values('1BM11CS003','C','Sr','19931127');
insert into student values('1BM11CS004','D','Sr','19930413');
insert into student values('1BM11CS005','E','Jr','19940824');
commit;
select * from student;
```

```
insert into course values(111,'OS','CSE');
insert into course values(112,'EC','ECE');
insert into course values(113,'SS','ISE');
insert into course values(114,'DBMS','CSE');
insert into course values(115,'SIGNALS','ECE');
commit;
select * from course;
```

```
insert into textbook values(10,'DATABASE SYSTEMS','PEARSON','SCHIELD');
insert into textbook values(900,'OPERATING SYSTEMS','PEARSON','LELAND');
insert into textbook values(901,'CIRCUITS','HALL INDIA','BOB');
insert into textbook values(902,'SYSTEM SOFTWARE','PETERSON','JACOB');
insert into textbook values(903,'SCHEDULING','PEARSON','PATIL');
insert into textbook values(904,'DATABASE SYSTEMS','PEARSON','JACOB');
insert into textbook values(905,'DATABASE MANAGER','PEARSON','BOB');
insert into textbook values(906,'SIGNALS','HALL INDIA','SUMIT');
commit;
select * from textbook;
```

```
insert into enroll values('1BM11CS001',115,3,100);
insert into enroll values('1BM11CS002',114,5,100);
insert into enroll values('1BM11CS003',113,5,100);
insert into enroll values('1BM11CS004',111,5,100);
insert into enroll values('1BM11CS005',112,3,100);
commit;
select * from enroll;
```

```
insert into book_adoption values(111,5,900);
insert into book_adoption values(111,5,903);
insert into book_adoption values(111,5,904);
insert into book_adoption values(112,3,901);
insert into book_adoption values(113,3,10);
insert into book_adoption values(114,5,905);
insert into book_adoption values(113,5,902);
```

```
insert into book_adoption values(115,3,906);
commit;
select * from book_adoption;
```

-- Query 1

```
insert into textbook values(908,'UNIX CONCEPTS','TATA MCGRAW HILL','SUMITABHA
DAS');
insert into book_adoption values(113,4,908);
select * from textbook;
select * from book_adoption;
```

-- Query 2

```
select c.courseno,t.book_isbn,t.book_title
from course c,book_adoption ba,textbook t
where c.courseno=ba.courseno
and ba.book_isbn=t.book_isbn
and c.dept='CSE'
and 2<(select COUNT(book_isbn)
from book_adoption b
where c.courseno=b.courseno)
order by t.book_title;
```

-- Query 3

```
select distinct c.dept
from course c
where c.dept in(select c.dept
from course c,book_adoption b,textbook t
where c.courseno=b.courseno
and t.book_isbn=b.book_isbn
and t.publisher='PEARSON')
and c.dept not in(select c.dept
from course c,book_adoption b,textbook t
where c.courseno=b.courseno
and t.book_isbn=b.book_isbn
and t.publisher != 'PEARSON');
```

## Output:

Select \* from student;

	regno	name	major	bdate
▶	1BM11CS001	A	Sr	1993-12-30
	1BM11CS002	B	Sr	1993-09-24
	1BM11CS003	C	Sr	1993-11-27
	1BM11CS004	D	Sr	1993-04-13
	1BM11CS005	E	Jr	1994-08-24
*	NULL	NULL	NULL	NULL

Select \* from course;

	courseno	cname	dept
▶	111	OS	CSE
	112	EC	ECE
	113	SS	ISE
	114	DBMS	CSE
	115	SIGNALS	ECE
*	NULL	NULL	NULL

Select \* from textbook;

	book_isbn	book_title	publisher	author
▶	10	DATABASE SYSTEMS	PEARSON	SCHIELD
	900	OPERATING SYSTEMS	PEARSON	LELAND
	901	CIRCUITS	HALL INDIA	BOB
	902	SYSTEM SOFTWARE	PETERSON	JACOB
	903	SCHEDULING	PEARSON	PATIL
	904	DATABASE SYSTEMS	PEARSON	JACOB
	905	DATABASE MANAGER	PEARSON	BOB
	906	SIGNALS	HALL INDIA	SUMIT
*	NULL	NULL	NULL	NULL

Select \* from enroll;

	regno	courseno	sem	marks
▶	IBM11CS001	115	3	100
	IBM11CS002	114	5	100
	IBM11CS003	113	5	100
	IBM11CS004	111	5	100
	IBM11CS005	112	3	100
*	NULL	NULL	NULL	NULL

Select \* from book\_adoption;

	courseno	sem	book_isbn
▶	111	5	900
	111	5	903
	111	5	904
	112	3	901
	113	3	10
	113	5	902
	114	5	905
	115	3	906
*	NULL	NULL	NULL

Query 1:

Select \* from textbook;

	book_isbn	book_title	publisher	author
▶	10	DATABASE SYSTEMS	PEARSON	SCHIELD
	900	OPERATING SYSTEMS	PEARSON	LELAND
	901	CIRCUITS	HALL INDIA	BOB
	902	SYSTEM SOFTWARE	PETERSON	JACOB
	903	SCHEDULING	PEARSON	PATIL
	904	DATABASE SYSTEMS	PEARSON	JACOB
	905	DATABASE MANAGER	PEARSON	BOB
	906	SIGNALS	HALL INDIA	SUMIT
	908	UNIX CONCEPTS	TATA MCGRAW HILL	SUMITABHA DAS
*	NULL	NULL	NULL	NULL

Select \* from book\_adoption;

	courseno	sem	book_isbn
▶	111	5	900
	111	5	903
	111	5	904
	112	3	901
	113	3	10
	113	5	902
	113	4	908
	114	5	905
	115	3	906
▲	NULL	NULL	NULL

Query 2:

	courseno	book_isbn	book_title
▶	111	904	DATABASE SYSTEMS
	111	900	OPERATING SYSTEMS
	111	903	SCHEDULING

Query 3:

	dept
▶	CSE

## Program 9: Movie Database

```
create database movie;
use movie;

create table actor(
act_id int,
act_name varchar(20),
act_gender char(1),
primary key(act_id));
desc actor;

create table director(
dir_id int,
dir_name varchar(20),
dir_phone int(10),
primary key(dir_id));
desc director;

alter table director
modify column dir_phone bigint;
desc director;

create table movies(
mov_id int,
mov_title varchar(25),
mov_year int,
mov_lang varchar(12),
dir_id int,
primary key(mov_id),
foreign key(dir_id) references director(dir_id));
desc movies;

create table movie_cast(
act_id int,
mov_id int,
role varchar(10),
primary key(act_id,mov_id),
foreign key(act_id) references actor(act_id),
foreign key(mov_id) references movies(mov_id));
desc movie_cast;
```

```

create table rating(
mov_id int,
rev_stars varchar(25),
primary key(mov_id),
foreign key(mov_id) references movies(mov_id));
desc rating;

insert into actor values(301,'ANUSHKA','F');
insert into actor values (302,'PRABHAS','M');
insert into actor values(303,'PUNITH','M');
insert into actor values(304,'JERMY','M');
commit;
select * from actor;

insert into director values(60,'RAJAMOULI', 8751611001);
insert into director values(61,'HITCHCOCK', 7766138911);
insert into director values(62,'FARAN', 9986776531);
insert into director values(63,'STEVEN SPIELBERG', 8989776530);
commit;
select * from director;

insert into movies values(1001,'BAHUBALI-2', 2017, 'TELAGU', 60);
insert into movies values(1002,'BAHUBALI-1', 2015, 'TELAGU', 60);
insert into movies values(1003,'AKASH', 2008, 'KANNADA', 61);
insert into movies values(1004,'WAR HORSE', 2011, 'ENGLISH', 63);
commit;
select * from movies;

insert into movie_cast values(301, 1002, 'HEROINE');
insert into movie_cast values(301, 1001, 'HEROINE');
insert into movie_cast values(303, 1003, 'HERO');
insert into movie_cast values(303, 1002, 'GUEST');
insert into movie_cast values(304, 1004, 'HERO');
commit;
select * from movie_cast;

insert into rating values(1001, 4);
insert into rating values(1002, 2);
insert into rating values(1003, 5);
insert into rating values(1004, 4);
commit;
select * from rating;

```

-- Query 1

```
select mov_title from movies m where dir_id=(select dir_id from director where
dir_name='Hitchcock');
```

```
select mov_title from movies m,director d where m.dir_id=d.dir_id and
d.dir_name='Hitchcock';
```

-- Query 2

```
select m.mov_title
from movies m, movie_cast mc
where m.mov_id=mc.mov_id
and mc.act_id in( select act_id from movie_cast group by act_id having
count(act_id)>1)
group by mov_title
having count(*)>1;
```

```
select m.mov_title from movies m,movie_cast mc where m.mov_id=mc.mov_id
and mc.act_id in(select act_id from movie_cast group by act_id having
count(act_id)>1)
group by mov_title having count(*)>1;
```

-- Query 3

```
select act_name,mov_title,mov_year from actor a join movie_cast mc on
a.act_id=mc.act_id join movies m on m.mov_id
=mc.mov_id where m.mov_year not between 2005 and 2015;
```

-- Query 4

```
select mov_title,max(rev_stars)
from movies
inner join rating using(mov_id)
group by mov_id
having max(rev_stars)>0
order by mov_title;
```

```
select mov_title,max(rev_stars) from movies m,rating r
where m.mov_id=r.mov_id group by r.mov_id having max(rev_stars)>0 order by
mov_title;
```



-- Query 5

```
update rating set rev_stars=5
where mov_id in(select mov_id from movies where dir_id in(select dir_id from
director where dir_name='Steven Spielberg'));
select *from rating;
```

## Output:

Select \* from actor;

	act_id	act_name	act_gender
▶	301	ANUSHKA	F
	302	PRABHAS	M
	303	PUNITH	M
	304	JERMY	M
*	NULL	NULL	NULL

Select \* from director;

	dir_id	dir_name	dir_phone
▶	60	RAJAMOULI	8751611001
	61	HITCHCOCK	7766138911
	62	FARAN	9986776531
	63	STEVEN SPIELBERG	8989776530
*	NULL	NULL	NULL

Select \* from movies;

	mov_id	mov_title	mov_year	mov_lang	dir_id
▶	1001	BAHUBALI-2	2017	TELAGU	60
	1002	BAHUBALI-1	2015	TELAGU	60
	1003	AKASH	2008	KANNADA	61
	1004	WAR HORSE	2011	ENGLISH	63
*	NULL	NULL	NULL	NULL	NULL

Select \* from movie\_cast;

	act_id	mov_id	role
▶	301	1001	HEROINE
	301	1002	HEROINE
	303	1002	GUEST
	303	1003	HERO
	304	1004	HERO
*	NULL	NULL	NULL

Select \* from rating;

	mov_id	rev_stars
▶	1001	4
	1002	2
	1003	5
	1004	4
*	NULL	NULL

Query 1:

	mov_title
▶	AKASH

	mov_title
▶	AKASH

Query 2:

	mov_title
▶	BAHUBALI-1

Query 3:

	act_name	mov_title	mov_year
▶	ANUSHKA	BAHUBALI-2	2017

Query 4:

	mov_title	max(rev_stars)
▶	AKASH	5
	BAHUBALI-1	2
	BAHUBALI-2	4
	WAR HORSE	4

	mov_title	max(rev_stars)
▶	AKASH	5
	BAHUBALI-1	2
	BAHUBALI-2	4
	WAR HORSE	4

Query 5:

	mov_id	rev_stars
▶	1001	4
	1002	2
	1003	5
	1004	5
*	NULL	NULL

## Program 10: College Database

```
create database collegedb;
use collegedb;

CREATE TABLE STUDENT (
USN VARCHAR (10),
SNAME VARCHAR (25),
ADDRESS VARCHAR (25),
PHONE LONG,
GENDER CHAR (1),
PRIMARY KEY (USN));
select * from student;

CREATE TABLE SEMSEC (
SSID VARCHAR (5),
SEM INT,
SEC CHAR (1),
PRIMARY KEY (SSID));
select * from semsec;

CREATE TABLE CLASS (
USN VARCHAR (10),
SSID VARCHAR (5),
PRIMARY KEY (USN, SSID),
FOREIGN KEY (USN) REFERENCES STUDENT (USN),
FOREIGN KEY (SSID) REFERENCES SEMSEC (SSID));
select * from class;

CREATE TABLE SUBJECT (
SUBCODE VARCHAR (8),
TITLE VARCHAR (20),
SEM INT,
CREDITS INT,
PRIMARY KEY (SUBCODE));
select * from subject;

CREATE TABLE IAMARKS (
USN VARCHAR (10),
SUBCODE VARCHAR (8),
SSID VARCHAR (5),
TEST1 INT,
TEST2 INT,
TEST3 INT,
```

```

FINALIA INT,
PRIMARY KEY (USN, SUBCODE, SSID),
FOREIGN KEY (USN) REFERENCES STUDENT (USN),
FOREIGN KEY (SUBCODE) REFERENCES SUBJECT (SUBCODE),
FOREIGN KEY (SSID) REFERENCES SEMSEC (SSID));
select * from iamarks;

```

```

INSERT INTO STUDENT VALUES ('1RN13CS020', 'AKSHAY', 'BELAGAVI', 8877881122, 'M');
INSERT INTO STUDENT VALUES ('1RN13CS062', 'SANDHYA', 'BENGALURU', 7722829912, 'F');
INSERT INTO STUDENT VALUES ('1RN13CS091', 'TEESHA', 'BENGALURU', 7712312312, 'F');
INSERT INTO STUDENT VALUES ('1RN13CS066', 'SUPRIYA', 'MANGALURU', 8877881122, 'F');
INSERT INTO STUDENT VALUES ('1RN14CS010', 'ABHAY', 'BENGALURU', 9900211201, 'M');
INSERT INTO STUDENT VALUES ('1RN14CS032', 'BHASKAR', 'BENGALURU', 9923211099, 'M');
INSERT INTO STUDENT VALUES ('1RN14CS025', 'ASMI', 'BENGALURU', 7894737377, 'F');
INSERT INTO STUDENT VALUES ('1RN15CS011', 'AJAY', 'TUMKUR', 9845091341, 'M');
INSERT INTO STUDENT VALUES ('1RN15CS029', 'CHITRA', 'DAVANGERE', 7696772121, 'F');
INSERT INTO STUDENT VALUES ('1RN15CS045', 'JEEVA', 'BELLARY', 9944850121, 'M');
INSERT INTO STUDENT VALUES ('1RN15CS091', 'SANTOSH', 'MANGALURU', 8812332201, 'M');
INSERT INTO STUDENT VALUES ('1RN16CS045', 'ISMAIL', 'KALBURGI', 9900232201, 'M');
INSERT INTO STUDENT VALUES ('1RN16CS088', 'SAMEERA', 'SHIMOGA', 9905542212, 'F');
INSERT INTO STUDENT VALUES ('1RN16CS122', 'VINAYAKA', 'CHIKAMAGALUR',
8800880011, 'M');
select * from student;

```

```

INSERT INTO SEMSEC VALUES ('CSE8A', 8, 'A');
INSERT INTO SEMSEC VALUES ('CSE8B', 8, 'B');
INSERT INTO SEMSEC VALUES ('CSE8C', 8, 'C');
INSERT INTO SEMSEC VALUES ('CSE7A', 7, 'A');
INSERT INTO SEMSEC VALUES ('CSE7B', 7, 'B');
INSERT INTO SEMSEC VALUES ('CSE7C', 7, 'C');
INSERT INTO SEMSEC VALUES ('CSE6A', 6, 'A');
INSERT INTO SEMSEC VALUES ('CSE6B', 6, 'B');
INSERT INTO SEMSEC VALUES ('CSE6C', 6, 'C');
INSERT INTO SEMSEC VALUES ('CSE5A', 5, 'A');
INSERT INTO SEMSEC VALUES ('CSE5B', 5, 'B');
INSERT INTO SEMSEC VALUES ('CSE5C', 5, 'C');
INSERT INTO SEMSEC VALUES ('CSE4A', 4, 'A');
INSERT INTO SEMSEC VALUES ('CSE4B', 4, 'B');
INSERT INTO SEMSEC VALUES ('CSE4C', 4, 'C');
INSERT INTO SEMSEC VALUES ('CSE3A', 3, 'A');
INSERT INTO SEMSEC VALUES ('CSE3B', 3, 'B');
INSERT INTO SEMSEC VALUES ('CSE3C', 3, 'C');
INSERT INTO SEMSEC VALUES ('CSE2A', 2, 'A');
INSERT INTO SEMSEC VALUES ('CSE2B', 2, 'B');
INSERT INTO SEMSEC VALUES ('CSE2C', 2, 'C');

```

```
INSERT INTO SEMSEC VALUES ('CSE1A', 1, 'A');
INSERT INTO SEMSEC VALUES ('CSE1B', 1, 'B');
INSERT INTO SEMSEC VALUES ('CSE1C', 1, 'C');
select * from semsec;
```

```
INSERT INTO CLASS VALUES ('1RN13CS020', 'CSE8A');
INSERT INTO CLASS VALUES ('1RN13CS062', 'CSE8A');
INSERT INTO CLASS VALUES ('1RN13CS066', 'CSE8B');
INSERT INTO CLASS VALUES ('1RN13CS091', 'CSE8C');
INSERT INTO CLASS VALUES ('1RN14CS010', 'CSE7A');
INSERT INTO CLASS VALUES ('1RN14CS025', 'CSE7A');
INSERT INTO CLASS VALUES ('1RN14CS032', 'CSE7A');
INSERT INTO CLASS VALUES ('1RN15CS011', 'CSE4A');
INSERT INTO CLASS VALUES ('1RN15CS029', 'CSE4A');
INSERT INTO CLASS VALUES ('1RN15CS045', 'CSE4B');
INSERT INTO CLASS VALUES ('1RN15CS091', 'CSE4C');
INSERT INTO CLASS VALUES ('1RN16CS045', 'CSE3A');
INSERT INTO CLASS VALUES ('1RN16CS088', 'CSE3B');
INSERT INTO CLASS VALUES ('1RN16CS122', 'CSE3C');
select * from class;
```

```
INSERT INTO SUBJECT VALUES ('10CS81', 'ACA', 8, 4);
INSERT INTO SUBJECT VALUES ('10CS82', 'SSM', 8, 4);
INSERT INTO SUBJECT VALUES ('10CS83', 'NM', 8, 4);
INSERT INTO SUBJECT VALUES ('10CS84', 'CC', 8, 4);
INSERT INTO SUBJECT VALUES ('10CS85', 'PW', 8, 4);
INSERT INTO SUBJECT VALUES ('10CS71', 'OOAD', 7, 4);
INSERT INTO SUBJECT VALUES ('10CS72', 'ECS', 7, 4);
INSERT INTO SUBJECT VALUES ('10CS73', 'PTW', 7, 4);
INSERT INTO SUBJECT VALUES ('10CS74', 'DWD', 7, 4);
INSERT INTO SUBJECT VALUES ('10CS75', 'JAVA', 7, 4);
INSERT INTO SUBJECT VALUES ('10CS76', 'SAN', 7, 4);
INSERT INTO SUBJECT VALUES ('15CS51', 'ME', 5, 4);
INSERT INTO SUBJECT VALUES ('15CS52', 'CN', 5, 4);
INSERT INTO SUBJECT VALUES ('15CS53', 'DBMS', 5, 4);
INSERT INTO SUBJECT VALUES ('15CS54', 'ATC', 5, 4);
INSERT INTO SUBJECT VALUES ('15CS55', 'JAVA', 5, 3);
INSERT INTO SUBJECT VALUES ('15CS56', 'AI', 5, 3);
INSERT INTO SUBJECT VALUES ('15CS41', 'M4', 4, 4);
INSERT INTO SUBJECT VALUES ('15CS42', 'SE', 4, 4);
INSERT INTO SUBJECT VALUES ('15CS43', 'DAA', 4, 4);
INSERT INTO SUBJECT VALUES ('15CS44', 'MPMC', 4, 4);
INSERT INTO SUBJECT VALUES ('15CS45', 'OOC', 4, 3);
INSERT INTO SUBJECT VALUES ('15CS46', 'DC', 4, 3);
```

```

INSERT INTO SUBJECT VALUES ('15CS31','M3', 3, 4);
INSERT INTO SUBJECT VALUES ('15CS32','ADE', 3, 4);
INSERT INTO SUBJECT VALUES ('15CS33','DSA', 3, 4);
INSERT INTO SUBJECT VALUES ('15CS34','CO', 3, 4);
INSERT INTO SUBJECT VALUES ('15CS35','USP', 3, 3);
INSERT INTO SUBJECT VALUES ('15CS36','DMS', 3, 3);
select * from subject;

```

```

INSERT INTO IAMARKS (USN, SUBCODE, SSID, TEST1, TEST2, TEST3) VALUES
('1RN13CS091','10CS81','CSE8C', 15, 16, 18);
INSERT INTO IAMARKS (USN, SUBCODE, SSID, TEST1, TEST2, TEST3) VALUES
('1RN13CS091','10CS82','CSE8C', 12, 19, 14);
INSERT INTO IAMARKS (USN, SUBCODE, SSID, TEST1, TEST2, TEST3) VALUES
('1RN13CS091','10CS83','CSE8C', 19, 15, 20);
INSERT INTO IAMARKS (USN, SUBCODE, SSID, TEST1, TEST2, TEST3) VALUES
('1RN13CS091','10CS84','CSE8C', 20, 16, 19);
INSERT INTO IAMARKS (USN, SUBCODE, SSID, TEST1, TEST2, TEST3) VALUES
('1RN13CS091','10CS85','CSE8C', 15, 15, 12);
select * from iamarks;

```

-- Query 1

```

SELECT S.*, SS.SEM, SS.SEC
FROM STUDENT S, SEMSEC SS, CLASS C
WHERE S.USN = C.USN AND
SS.SSID = C.SSID AND
SS.SEM = 4 AND SS.SEC='C';

```

-- Query 2

```

SELECT SS.SEM, SS.SEC, S.GENDER, COUNT(S.GENDER) AS COUNT
FROM STUDENT S, SEMSEC SS, CLASS C
WHERE S.USN = C.USN AND
SS.SSID = C.SSID
GROUP BY SS.SEM, SS.SEC, S.GENDER
ORDER BY SEM;

```

-- Query 3

```

CREATE VIEW STU_TEST1_MARKS_VIEW
AS
SELECT TEST1, SUBCODE
FROM IAMARKS
WHERE USN = '1RN13CS091';

```

```
SELECT * FROM STU_TEST1_MARKS_VIEW;
```

```
-- Query 5
```

```
SELECT S.USN,S.SNAME,S.ADDRESS,S.PHONE,S.GENDER,  
(CASE  
WHEN IA.FINALIA BETWEEN 17 AND 20 THEN 'OUTSTANDING'  
WHEN IA.FINALIA BETWEEN 12 AND 16 THEN 'AVERAGE'  
ELSE 'WEAK'  
END) AS CAT  
FROM STUDENT S, SEMSEC SS, IAMARKS IA, SUBJECT SUB  
WHERE S.USN = IA.USN AND  
SS.SSID = IA.SSID AND  
SUB.SUBCODE = IA.SUBCODE AND  
SUB.SEM = 8;
```

## Output:

Select \* from student;

	USN	SNAME	ADDRESS	PHONE	GENDER
▶	1RN13CS020	AKSHAY	BELAGAVI	8877881122	M
	1RN13CS062	SANDHYA	BENGALURU	7722829912	F
	1RN13CS066	SUPRIYA	MANGALURU	8877881122	F
	1RN13CS091	TEESHA	BENGALURU	7712312312	F
	1RN14CS010	ABHAY	BENGALURU	9900211201	M
	1RN14CS025	ASMI	BENGALURU	7894737377	F
	1RN14CS032	BHASKAR	BENGALURU	9923211099	M
	1RN15CS011	AJAY	TUMKUR	9845091341	M
	1RN15CS029	CHITRA	DAVANGERE	7696772121	F
	1RN15CS045	JEEVA	BELLARY	9944850121	M
	1RN15CS091	SANTOSH	MANGALURU	8812332201	M
	1RN16CS045	ISMAIL	KALBURGI	9900232201	M
	1RN16CS088	SAMEERA	SHIMOGA	9905542212	F
	1RN16CS122	VINAYAKA	CHIKAMAG...	8800880011	M
*	NULL	NULL	NULL	NULL	NULL



Select \* from semsec;

	SSID	SEM	SEC
▶	CSE1A	1	A
	CSE1B	1	B
	CSE1C	1	C
	CSE2A	2	A
	CSE2B	2	B
	CSE2C	2	C
	CSE3A	3	A
	CSE3B	3	B
	CSE3C	3	C
	CSE4A	4	A
	CSE4B	4	B
	CSE4C	4	C
	CSE5A	5	A
	CSE5B	5	B
	CSE5C	5	C
	CSE6A	6	A
	CSE6B	6	B
	CSE6C	6	C
	CSE7A	7	A
	CSE7B	7	B
	CSE7C	7	C
	CSE8A	8	A
	CSE8B	8	B
	CSE8C	8	C
*	NULL	NULL	NULL

Select \* from class;

	USN	SSID
▶	1RN16CS045	CSE3A
	1RN16CS088	CSE3B
	1RN16CS122	CSE3C
	1RN15CS011	CSE4A
	1RN15CS029	CSE4A
	1RN15CS045	CSE4B
	1RN15CS091	CSE4C
	1RN14CS010	CSE7A
	1RN14CS025	CSE7A
	1RN14CS032	CSE7A
	1RN13CS020	CSE8A
	1RN13CS062	CSE8A
	1RN13CS066	CSE8B
	1RN13CS091	CSE8C
*	NULL	NULL

Select \* from subject;

SUBCODE	TITLE	SEM	CREDITS
10CS71	OOAD	7	4
10CS72	ECS	7	4
10CS73	PTW	7	4
10CS74	DWDM	7	4
10CS75	JAVA	7	4
10CS76	SAN	7	4
10CS81	ACA	8	4
10CS82	SSM	8	4
10CS83	NM	8	4
10CS84	CC	8	4
10CS85	PW	8	4
15CS31	M3	3	4
15CS32	ADE	3	4
15CS33	DSA	3	4
15CS34	CO	3	4
15CS35	USP	3	3
15CS36	DMS	3	3
15CS41	M4	4	4
15CS42	SE	4	4
15CS43	DAA	4	4
15CS44	MPMC	4	4
15CS45	OOC	4	3
15CS46	DC	4	3
15CS51	ME	5	4
15CS52	CN	5	4
15CS53	DBMS	5	4
15CS54	ATC	5	4
15CS55	JAVA	5	3
15CS56	AI	5	3

Select \* from iamarks;

USN	SUBCODE	SSID	TEST1	TEST2	TEST3	FINALIA
1RN13CS091	10CS81	CSE8C	15	16	18	NULL
1RN13CS091	10CS82	CSE8C	12	19	14	NULL
1RN13CS091	10CS83	CSE8C	19	15	20	NULL
1RN13CS091	10CS84	CSE8C	20	16	19	NULL
1RN13CS091	10CS85	CSE8C	15	15	12	NULL
NULL	NULL	NULL	NULL	NULL	NULL	NULL

Query 1:

	USN	SNAME	ADDRESS	PHONE	GENDER	SEM	SEC
▶	1RN15CS091	SANTOSH	MANGALURU	8812332201	M	4	C

Query 2:

	SEM	SEC	GENDER	COUNT
▶	3	A	M	1
	3	B	F	1
	3	C	M	1
	4	A	F	1
	4	A	M	1
	4	B	M	1
	4	C	M	1
	7	A	F	1
	7	A	M	2
	8	A	F	1
	8	A	M	1
	8	B	F	1
	8	C	F	1

Query 3:

	TEST1	SUBCODE
▶	15	10CS81
	12	10CS82
	19	10CS83
	20	10CS84
	15	10CS85

Query 5:

	USN	SNAME	ADDRESS	PHONE	GENDER	CAT
▶	1RN13CS091	TEESHA	BENGALURU	7712312312	F	WEAK
	1RN13CS091	TEESHA	BENGALURU	7712312312	F	WEAK
	1RN13CS091	TEESHA	BENGALURU	7712312312	F	WEAK
	1RN13CS091	TEESHA	BENGALURU	7712312312	F	WEAK
	1RN13CS091	TEESHA	BENGALURU	7712312312	F	WEAK