VISVESVARAYA TECHNOLOGICAL UNIVERSITY

“JnanaSangama”, Belgaum -590014, Karnataka.

LAB REPORT

on

Database Management Systems (23CS3PCDBM)

Submitted by

PRANAV HEBBAR K (1BM24CS214)

in partial fulfilment for the award of the degree of

BACHELOR OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING

B.M.S. COLLEGE OF ENGINEERING

(Autonomous Institution under VTU)

BENGALURU-560019

Sep-2025 to Jan-2026

B. M. S. College of Engineering,
Bull Temple Road, Bangalore 560019
(Affiliated To Visvesvaraya Technological University, Belgaum)
Department of Computer Science and Engineering

CERTIFICATE

This is to certify that the Lab work entitled "Database Management Systems (23CS3PCDBM)" carried out by **PRANAV HEBBAR K (1BM24CS214),** who is Bonafede student of **B. M. S. College of Engineering.** It is in partial fulfilment for the award of **Bachelor of Engineering in Computer Science and Engineering** of the Visvesvaraya Technological University, Belgaum during the year 2022. The Lab report has been approved as it satisfies the academic requirements in respect of a Database Management Systems (23CS3PCDBM) work prescribed for the said degree.

Lab faculty Incharge Name Prof RASHMI H Assistant Professor Department of CSE, BMSCE	Dr. KAVITHA SOODA Professor HOD Department of CSE, BMSCE

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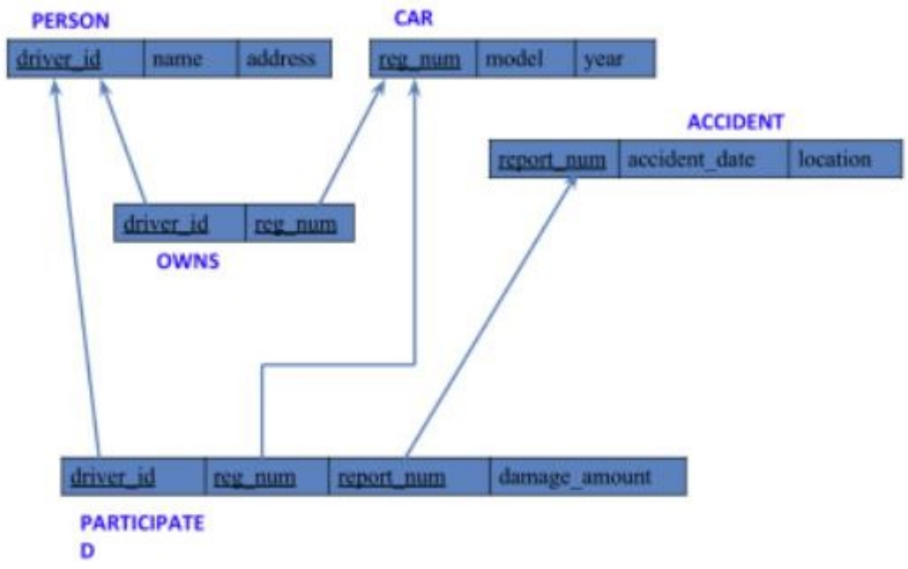
INSURANCE DATABASE

Question (Week 1)

- 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)

- Create the above tables by properly specifying the primary keys and the foreign keys. - Enter at least five tuples for each relation
- Display Accident date and location
- Update the damage amount to 25000 for the car with a specific reg_num (example "KA053408") for which the accident report number was 12.
- Add a new accident to the database.
- To Do
  - Display Accident date and location
  - Display driver id who did accident with damage amount greater than or equal to Rs.25000

SCHEMA DIAGRAM



CREATE DATABASES:

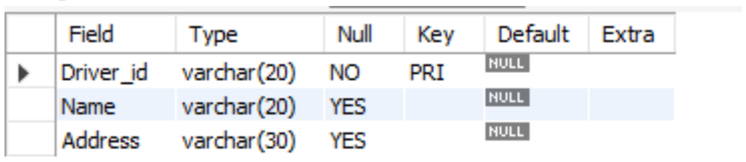
```
create database insurance; use
INSURANCE;
```

CREATE TABLES:

```
create table person
(Driver_id varchar(10),
Name varchar(20),
Address varchar(30),
primary key(Driver_id));

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

create table accident
(Report_num int,
Accident_date date, location
varchar(20), primary
key(Report_num));

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)); 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));
```

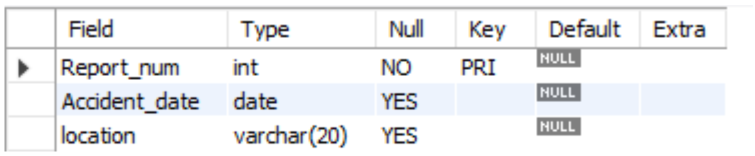
STRUCTURE OF THE TABLE:

desc person;



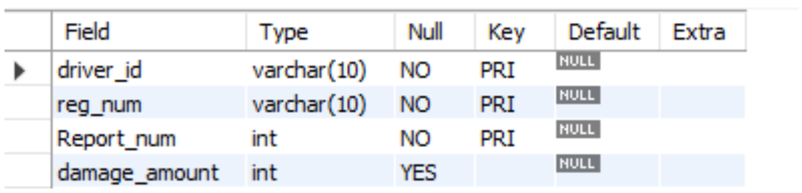
	Field	Type	Null	Key	Default	Extra
▶	Driver_id	varchar(20)	NO	PRI	NULL	
	Name	varchar(20)	YES		NULL	
	Address	varchar(30)	YES		NULL	

desc accident;



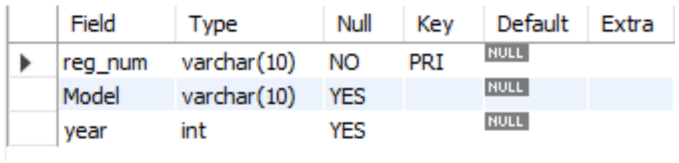
	Field	Type	Null	Key	Default	Extra
▶	Report_num	int	NO	PRI	NULL	
	Accident_date	date	YES		NULL	
	location	varchar(20)	YES		NULL	

desc participated;



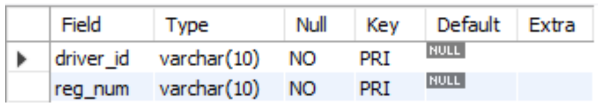
	Field	Type	Null	Key	Default	Extra
▶	driver_id	varchar(10)	NO	PRI	NULL	
	reg_num	varchar(10)	NO	PRI	NULL	
	Report_num	int	NO	PRI	NULL	
	damage_amount	int	YES		NULL	

desc car;



	Field	Type	Null	Key	Default	Extra
▶	reg_num	varchar(10)	NO	PRI	NULL	
	Model	varchar(10)	YES		NULL	
	year	int	YES		NULL	

desc owns;

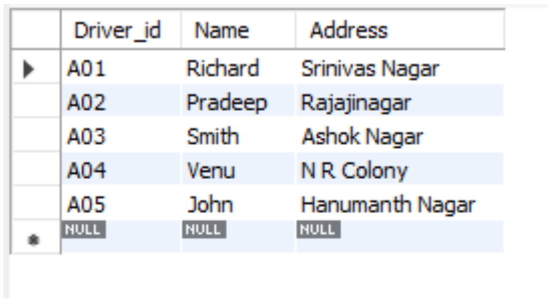


	Field	Type	Null	Key	Default	Extra
▶	driver_id	varchar(10)	NO	PRI	NULL	
	reg_num	varchar(10)	NO	PRI	NULL	

INSERTING VALUES TO THE TABLE:

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

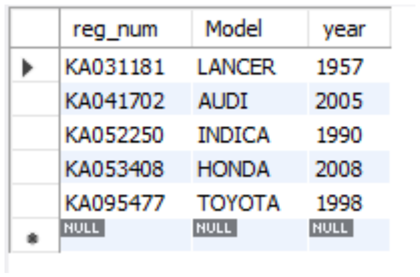
* from person;



	Driver_id	Name	Address
▶	A01	Richard	Srinivas Nagar
	A02	Pradeep	Rajajinagar
	A03	Smith	Ashok Nagar
	A04	Venu	N R Colony
	A05	John	Hanumanth Nagar
*	NULL	NULL	NULL

insert into car values('KA052250','INDICA','1990');
insert into car values('KA031181', 'LANCER','1957');
insert into car values('KA095477','TOYOTA','1998');
insert into car values('KA053408', 'HONDA','2008');
insert into car values('KA041702','AUDI','2005');

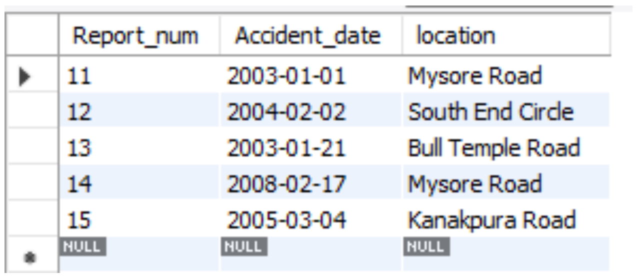
select * from car;



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

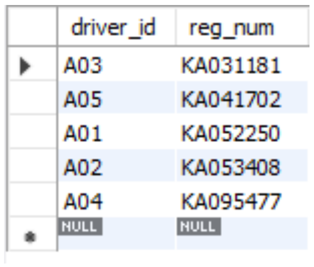
insert into accident values('11','2003-01-01','Mysore Road'); insert into
accident values('12', '2004-02-02','South End Circle'); insert into
accident values('13','2003-01-21','Bull Temple Road'); insert into
accident values('14', '2008-02-17','Mysore Road'); insert into accident
values('15','2005-03-04','Kanakpura Road');

select * from accident;



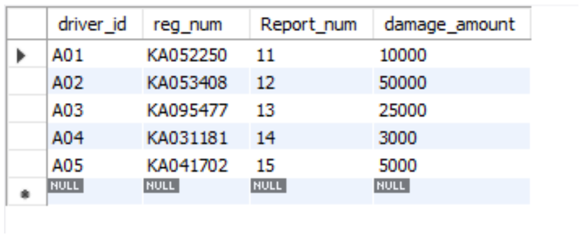
	Report_num	Accident_date	location
▶	11	2003-01-01	Mysore Road
	12	2004-02-02	South End Circle
	13	2003-01-21	Bull Temple Road
	14	2008-02-17	Mysore Road
	15	2005-03-04	Kanakpura Road
*	NULL	NULL	NULL

```
insert into owns values('A01','KA052250');
insert into owns values('A02','KA053408');
insert into owns values('A03','KA031181');
insert into owns values('A04','KA095477');
insert into owns values('A05','KA041702');

select * from owns;
```



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

```
insert into participated values('A01','KA052250','11','10000'); insert
into participated values('A02','KA053408','12','50000'); insert into
participated values('A03','KA095477','13','25000'); insert into
participated values('A04','KA031181','14','3000'); insert into
participated values('A05','KA041702','15','5000');

Select * from participated;
```

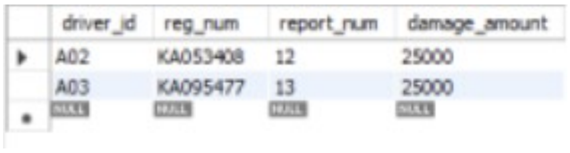


	driver_id	reg_num	Report_num	damage_amount
▶	A01	KA052250	11	10000
	A02	KA053408	12	50000
	A03	KA095477	13	25000
	A04	KA031181	14	3000
	A05	KA041702	15	5000
*	NULL	NULL	NULL	NULL

QUERIES

- **Update the damage amount to 25000 for the car with a specific reg-num for which the accident report number was 12.**

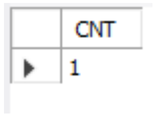
```
update participated
set damage_amount=25000
where reg_num='KA053408' and report_num=12;
```



	driver_id	reg_num	report_num	damage_amount
▶	A02	KA053408	12	25000
	A03	KA095477	13	25000
*	NULL	NULL	NULL	NULL

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

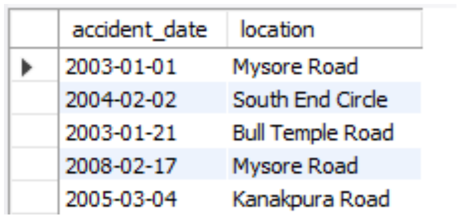
  select count(distinct driver_id) CNT
  from participated a, accident b
  where a.report_num=b.report_num and b.accident_date like '2008%';



	CNT
▶	1

- **Display Accident date and location**

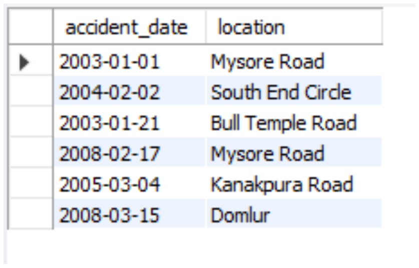
  select accident_date, location from accident;



	accident_date	location
▶	2003-01-01	Mysore Road
	2004-02-02	South End Circle
	2003-01-21	Bull Temple Road
	2008-02-17	Mysore Road
	2005-03-04	Kanakpura Road

- **Add a new accident to the database.**

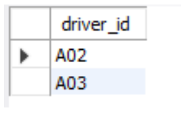
  insert into accident values ('16','2008-03-15','Domlur'); select
  accident_date, location from accident;



	accident_date	location
▶	2003-01-01	Mysore Road
	2004-02-02	South End Circle
	2003-01-21	Bull Temple Road
	2008-02-17	Mysore Road
	2005-03-04	Kanakpura Road
	2008-03-15	Domlur

- **Display driver id who did accident with damage amount greater than or equal to Rs.25000**

  select driver_id from participated where damage_amount >=25000;



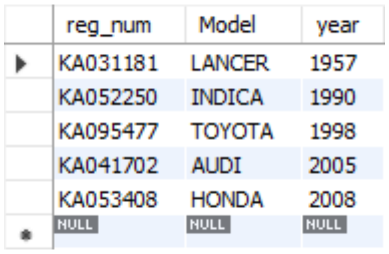
	driver_id
▶	A02
	A03

Additional Queries on Insurance Database

Questions (Week 2)

- **Display the entire CAR relation in the ascending order of manufacturing year.**

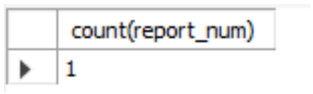
  select *from car order by year asc;



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

- **Find the number of accidents in which cars belonging to a specific model (example 'Lancer') were involved.**

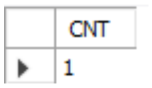
  select count(report_num) from car c, participated p where c.reg_num = p.reg_num and c.model='Lancer';



	count(report_num)
▶	1

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

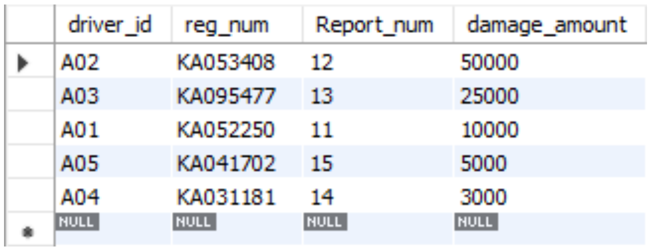
  select count(distinct driver_id) CNT from participated a, accident b where a.report_num=b.report_num and b.accident_date like '_08%';



	CNT
▶	1

- **List the entire participated relation in the descending order of damage amount.**

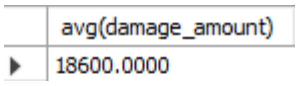
  select *from participated order by damage_amount desc;



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

- **Find the average damage amount**

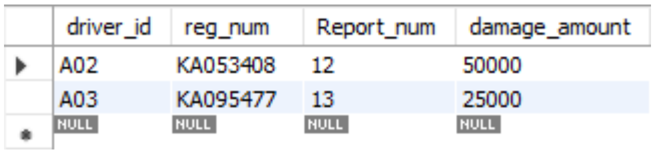
```
select avg(damage_amount) from participated;
```



	avg(damage_amount)
▶	18600.0000

- **Delete the tuple whose damage amount is below the average damage amount**

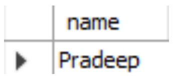
```
delete from participated where damage_amount<18600; select
*from participated;
```



	driver_id	reg_num	Report_num	damage_amount
▶	A02	KA053408	12	50000
	A03	KA095477	13	25000
*	NULL	NULL	NULL	NULL

- **List the name of drivers whose damage is greater than the average damage amount.**

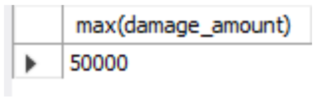
```
select name from person a, participated b
WHERE a.driver_id = b.driver_id and
damage_amount > (select avg(damage_amount) from participated);
```



	name
▶	Pradeep

- **Find maximum damage amount.**

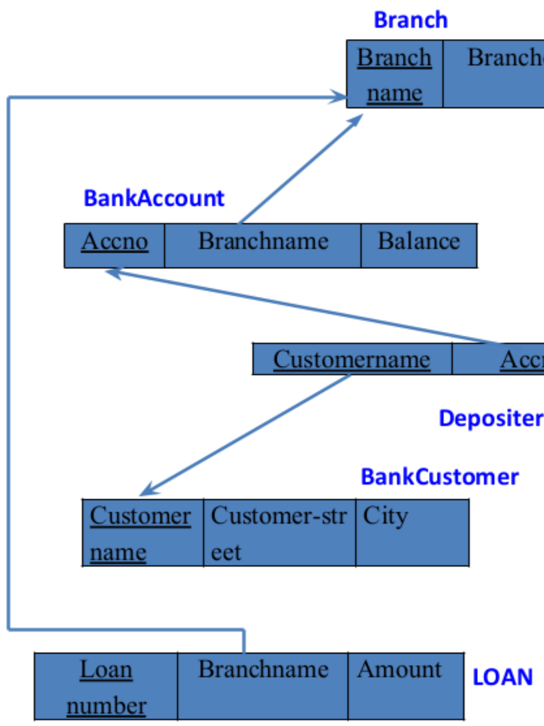
```
select max(damage_amount) from participated;
```



	max(damage_amount)
▶	50000

BANK DATABASE

Schema Diagram:



Questions(week3)

- 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)

- Create the above tables by properly specifying the primary keys and the foreign keys.
- Enter at least five tuples for each relation.
- Display the branch name and assets from all branches in lakhs of rupees and rename the assets column to 'assets in lakhs'.
- Find all the customers who have at least two accounts at the same branch (ex. SBI_ResidencyRoad).
- Create a view which gives each branch the sum of the amount of all the loans at the branch.

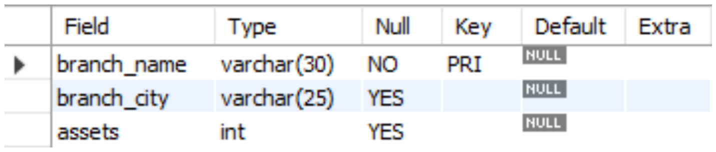
Create table:

```
CREATE TABLE branch ( branch_name
    VARCHAR(30), branch_city
    VARCHAR(25), assets INT,
    PRIMARY KEY (branch_name)
);

CREATE TABLE bankaccount ( accno
    INT,
    branch_name VARCHAR(30),
    balance INT,
    PRIMARY KEY (accno),
    FOREIGN KEY (branch_name)
        REFERENCES branch (branch_name)
);

CREATE TABLE bankcustomer
    ( customername VARCHAR(20),
    customer_street VARCHAR(30),
    customer_city VARCHAR(35),
    PRIMARY KEY (customername)
);

CREATE TABLE depositer
    ( customername VARCHAR(20),
    accno INT,
    PRIMARY KEY (customername , accno),  FOREIGN
    KEY (accno)
        REFERENCES bankaccount (accno), FOREIGN
    KEY (customername)
        REFERENCES bankcustomer (customername)
);
```

```
CREATE TABLE loan (
loan_number INT, branch_name VARCHAR(30),  amount INT,
PRIMARY KEY (loan_number),
FOREIGNKEY(branch_name)REFERENCES branch (branch_name));
```

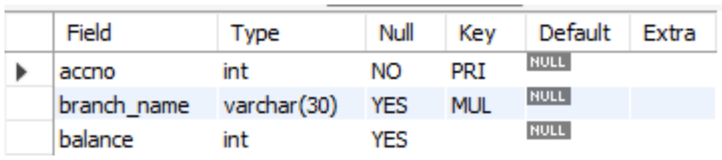
Structure of the table:

desc branch;



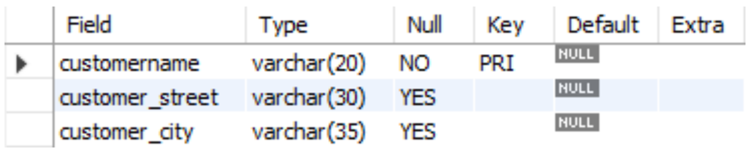
Field	Type	Null	Key	Default	Extra
branch_name	varchar(30)	NO	PRI	NULL	
branch_city	varchar(25)	YES		NULL	
assets	int	YES		NULL	

desc bankaccount;



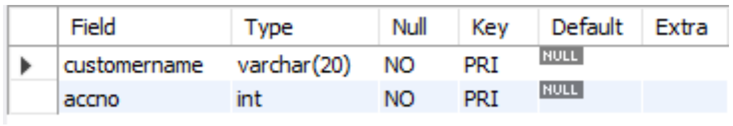
Field	Type	Null	Key	Default	Extra
accno	int	NO	PRI	NULL	
branch_name	varchar(30)	YES	MUL	NULL	
balance	int	YES		NULL	

desc bankcustomer;



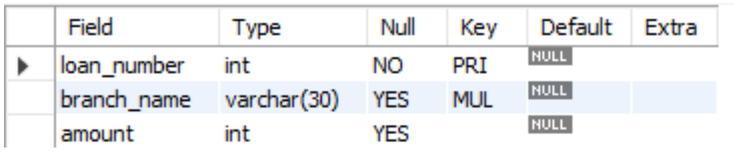
Field	Type	Null	Key	Default	Extra
customername	varchar(20)	NO	PRI	NULL	
customer_street	varchar(30)	YES		NULL	
customer_city	varchar(35)	YES		NULL	

desc depositer;



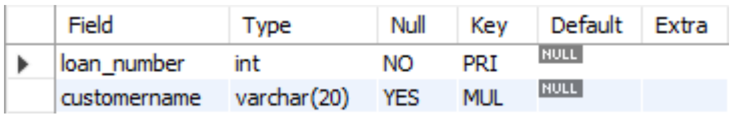
Field	Type	Null	Key	Default	Extra
customername	varchar(20)	NO	PRI	NULL	
accno	int	NO	PRI	NULL	

desc loan;



Field	Type	Null	Key	Default	Extra
loan_number	int	NO	PRI	NULL	
branch_name	varchar(30)	YES	MUL	NULL	
amount	int	YES		NULL	

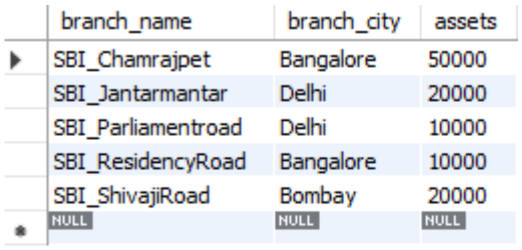
desc borrower;



Field	Type	Null	Key	Default	Extra
loan_number	int	NO	PRI	NULL	
customername	varchar(20)	YES	MUL	NULL	

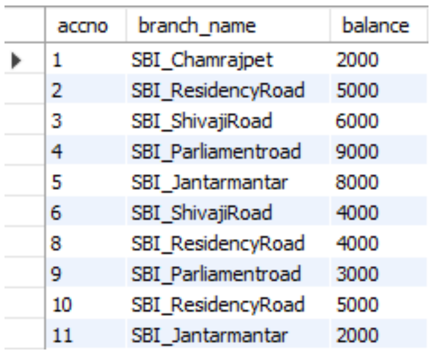
Inserting values to the table:

```
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);

select * from branch;
```



	branch_name	branch_city	assets
▶	SBI_Chamrajpet	Bangalore	50000
	SBI_Jantarmantar	Delhi	20000
	SBI_Parliamentroad	Delhi	10000
	SBI_ResidencyRoad	Bangalore	10000
	SBI_ShivajiRoad	Bombay	20000
*	NULL	NULL	NULL

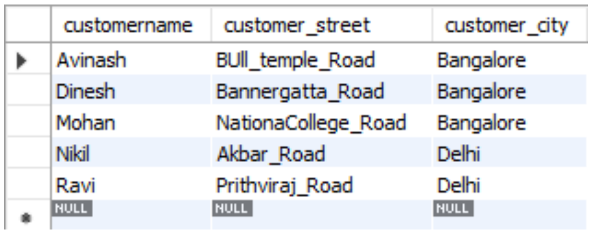
```
insert into bankaccount values(1,"SBI_Chamrajpet",2000);  insert into
bankaccount values(2,"SBI_ResidencyRoad",5000); insert into
bankaccount values(3,"SBI_ShivajiRoad",6000); insert into
bankaccount values(4,"SBI_Parliamentroad",9000); insert into
bankaccount values(5,"SBI_Jantarmantar",8000); insert into
bankaccount values(6,"SBI_ShivajiRoad",4000); insert into
bankaccount values(8,"SBI_ResidencyRoad",4000); insert into
bankaccount values(9,"SBI_Parliamentroad",3000); insert into
bankaccount values(10,"SBI_ResidencyRoad",5000); insert into
bankaccount values(11,"SBI_Jantarmantar",2000);

select * from bankaccount;
```



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

insert into bankcustomer values("Avinash","BUll_temple_Road","Bangalore"); insert into bankcustomer values("Dinesh","Bannergatta_Road","Bangalore"); insert into bankcustomer values("Mohan","NationaCollege_Road","Bangalore"); insert into bankcustomer values("Nikil","Akbar_Road","Delhi");
insert into bankcustomer values("Ravi","Prithviraj_Road","Delhi"); select *

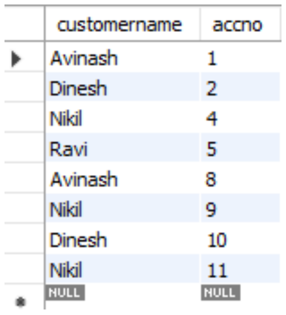
from bankcustomer;



customername	customer_street	customer_city
Avinash	BUll_temple_Road	Bangalore
Dinesh	Bannergatta_Road	Bangalore
Mohan	NationaCollege_Road	Bangalore
Nikil	Akbar_Road	Delhi
Ravi	Prithviraj_Road	Delhi
NULL	NULL	NULL

insert into depositer values("Avinash",1);
insert into depositer values("Dinesh",2);
insert into depositer values("Nikil",4); insert into depositer values("Ravi",5); insert into depositer values("Avinash",8); insert into depositer values("Nikil",9); insert into depositer values("Dinesh",10); insert into depositer values("Nikil",11);

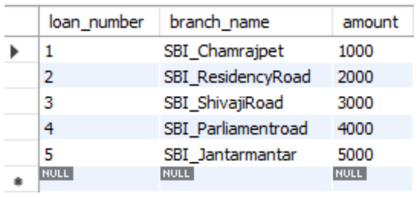
select * from depositer;



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

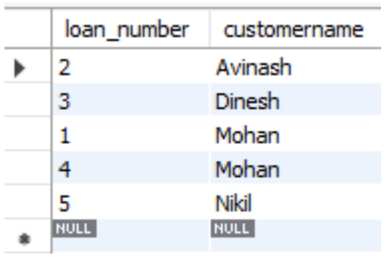
insert into loan values(1,"SBI_Chamrajpet",1000); insert into loan values(2,"SBI_ResidencyRoad",2000); insert into loan values(3,"SBI_ShivajiRoad",3000); insert into loan values(4,"SBI_Parliamentroad",4000); insert into loan values(5,"SBI_Jantarmantar",5000);

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_Jantarmantar	5000
NULL	NULL	NULL

```
insert into borrower values(1,"Mohan"); insert
into borrower values(2,"Avinash"); insert into
borrower values(3,"Dinesh"); insert into
borrower values(4,"Mohan"); insert into
borrower values(5,"Nikil");

select * from borrower;
```

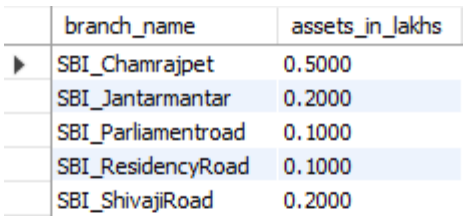


	loan_number	customername
▶	2	Avinash
	3	Dinesh
	1	Mohan
	4	Mohan
	5	Nikil
*	NULL	NULL

Queries:

- **Display the branch name and assets from all branches in lakhs of rupees and rename the assets column to 'assets in lakhs'.**

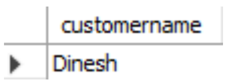
```
select branch_name,(assets/100000) as assets_in_lakhs from branch;
```



	branch_name	assets_in_lakhs
▶	SBI_Chamrajpet	0.5000
	SBI_Jantarmantar	0.2000
	SBI_Parliamentroad	0.1000
	SBI_ResidencyRoad	0.1000
	SBI_ShivajiRoad	0.2000

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

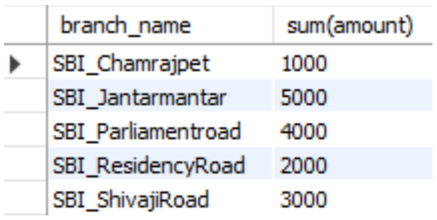
```
SELECT d.customername FROM depositer d,bankaccount b
WHERE b.branch_name = 'SBI_ResidencyRoad'
AND d.accno = b.accno   GROUP
BY d.customername HAVING
COUNT(d.accno) >= 2;
```



	customername
▶	Dinesh

- **Create a view which gives each branch the sum of the amount of all the loans at the branch.**

```
create view sum_of_loan
as select branch_name,sum(amount) from loan group
by branch_name;

select * from sum_of_loan;
```



	branch_name	sum(amount)
▶	SBI_Chamrajpet	1000
	SBI_Jantarmantar	5000
	SBI_Parliamentroad	4000
	SBI_ResidencyRoad	2000
	SBI_ShivajiRoad	3000

Additional Queries on Bank Database

Questions (week 4)

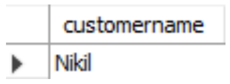
- Branch (branch-name: String, branch-city: String, assets: real)
- Bankaccount(accno: int, branch-name: String, balance: real)
- Bankcustomer (customer-name: String, customer-street: String, customer-city: String)
- Depositer(customer-name: String, accno: int)
- Loan (loan-number: int, branch-name: String, amount: real)

- Find all the customers who have an account at all the branches located in a specific city (Ex. Delhi).
- Find all customers who have a loan at the bank but do not have an account.
- Find all customers who have both an account and a loan at the Bangalore branch
- Find the names of all branches that have greater assets than all branches located in Bangalore.
- Demonstrate how you delete all account tuples at every branch located in a specific city (Ex. Bombay).
- Update the Balance of all accounts by 5%

Queries:

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

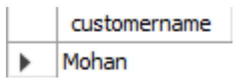
```
select distinct s.customername from depositer s
where not exists ((select branch_name from branch where branch_city="Delhi") except (select
r.branch_name from depositer t, bankaccount r
where t.accno=r.accno and
s.customername=t.customername));
```



```
customername
Nikil
```

- Find all customers who have a loan at the bank but do not have an account.

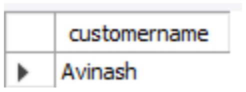
```
select distinct customername from borrower
where customername not in (select customername from depositer);
```



```
customername
Mohan
```

- **Find all customers who have both an account and a loan at the Bangalore branch**

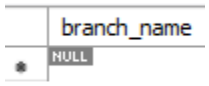
```
SELECT DISTINCT b.customername FROM borrower b, loan l, depositer d, branch br WHERE
b.loan_number = l.loan_number
AND l.branch_name = br.branch_name AND
br.branch_city = 'Bangalore'
AND b.customername IN (SELECT customername FROM depositer);
```



	customername
▶	Avinash

- **Find the names of all branches that have greater assets than all branches located in Bangalore.**

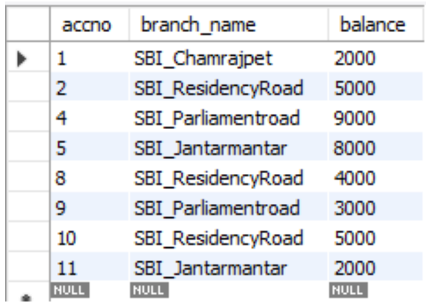
```
SELECT branch_name FROM branch
WHERE assets > ALL (SELECT assets FROM branch
WHERE branch_city = 'Bangalore');
```



	branch_name
*	NULL

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

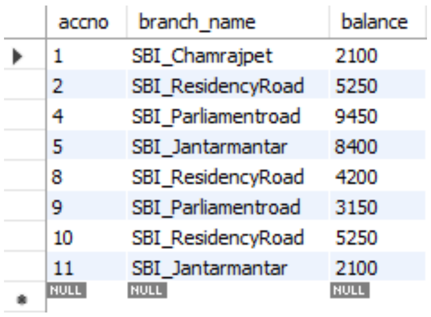
```
DELETE FROM bankaccount
WHERE branch_name IN (SELECT branch_name FROM branch WHERE
branch_city = "Bombay");
```



	accno	branch_name	balance
▶	1	SBI_Chamrajpet	2000
	2	SBI_ResidencyRoad	5000
	4	SBI_Parliamentroad	9000
	5	SBI_Jantarmantar	8000
	8	SBI_ResidencyRoad	4000
	9	SBI_Parliamentroad	3000
	10	SBI_ResidencyRoad	5000
	11	SBI_Jantarmantar	2000
*	NULL	NULL	NULL

- **Update the Balance of all accounts by 5%**

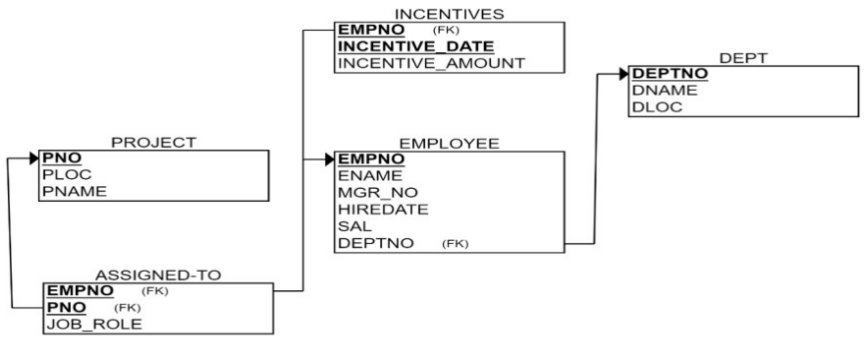
```
UPDATE bankaccount
SET balance = balance * 1.05; select

* from bankaccount;
```



	accno	branch_name	balance
▶	1	SBI_Chamrajpet	2100
	2	SBI_ResidencyRoad	5250
	4	SBI_Parliamentroad	9450
	5	SBI_Jantarmantar	8400
	8	SBI_ResidencyRoad	4200
	9	SBI_Parliamentroad	3150
	10	SBI_ResidencyRoad	5250
	11	SBI_Jantarmantar	2100
*	NULL	NULL	NULL

EMPLOYEE DATABASE

Schema Diagram:



Questions (week 5):

- Using Scheme diagram, create tables by properly specifying the primary keys and the foreign keys.
- Enter greater than five tuples for each table.
- Retrieve the employee numbers of all employees who work on project located in Bengaluru, Hyderabad, or Mysuru
- Get Employee ID's of those employees who didn't receive incentives
- Write a SQL query to find the employees name, number, dept, job_role, department location and project location who are working for a project location same as his/her department location.
- increase income of all employees by 5% in a table.

Create database:

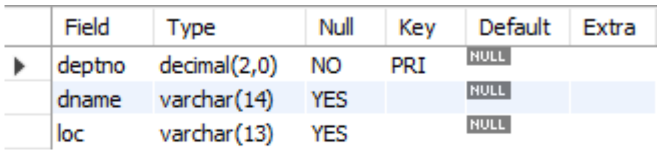
```
create database emp; use
emp;
```

Create tables:

```
create table dept (
    deptno decimal(2 , 0 ) primary key, dname
    varchar(14) default null,
    loc varchar(13) default null
);

create table emp (
    empno decimal(4 , 0 ) primary key, ename
    varchar(10) default null, mgr_no
    decimal(4 , 0 ) default null, hiredate date
    default null,
    sal decimal(7 , 2 ) default null,
    deptno decimal(2 , 0 ) references dept (deptno) on
    delete cascade on update cascade
);

create table incentives (
    empno decimal(4 , 0 ) references emp (empno) on
    delete cascade on update cascade, incentive_date
    date,
    incentive_amount decimal(10 , 2 ), primary
    key (empno , incentive_date)
);

create table project ( pno
    int primary key,
    pname varchar(30) not null,
    ploc varchar(30)
);


create table assigned_to (
    empno decimal(4 , 0 ) references emp (empno) on
    delete cascade on update cascade,
    pno int references project (pno)
    on delete cascade on update cascade, job_role
    varchar(30),
    primary key (empno , pno));
```

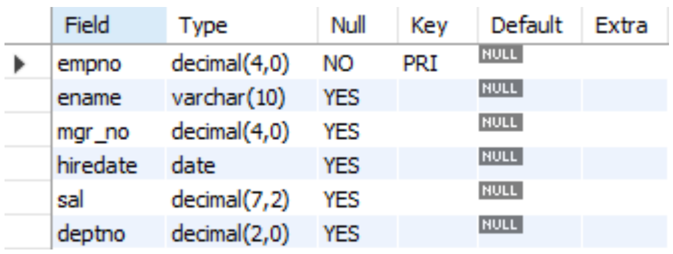
Structure of table:

desc dept;



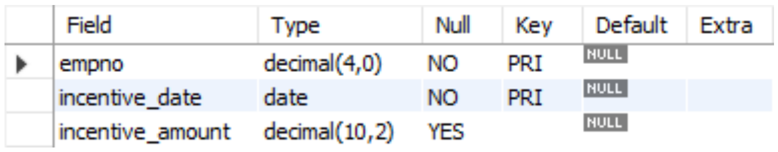
Field	Type	Null	Key	Default	Extra
deptno	decimal(2,0)	NO	PRI	NULL	
dname	varchar(14)	YES		NULL	
loc	varchar(13)	YES		NULL	

desc emp;



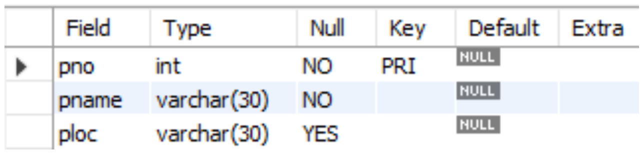
Field	Type	Null	Key	Default	Extra
empno	decimal(4,0)	NO	PRI	NULL	
ename	varchar(10)	YES		NULL	
mgr_no	decimal(4,0)	YES		NULL	
hiredate	date	YES		NULL	
sal	decimal(7,2)	YES		NULL	
deptno	decimal(2,0)	YES		NULL	

desc incentives;



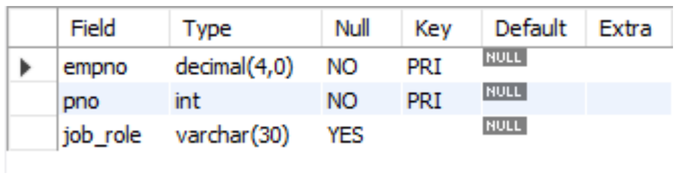
Field	Type	Null	Key	Default	Extra
empno	decimal(4,0)	NO	PRI	NULL	
incentive_date	date	NO	PRI	NULL	
incentive_amount	decimal(10,2)	YES		NULL	

desc project;



Field	Type	Null	Key	Default	Extra
pno	int	NO	PRI	NULL	
pname	varchar(30)	NO		NULL	
ploc	varchar(30)	YES		NULL	

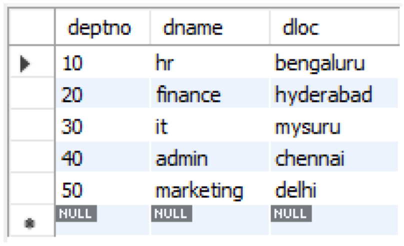
desc assigned_to;



Field	Type	Null	Key	Default	Extra
empno	decimal(4,0)	NO	PRI	NULL	
pno	int	NO	PRI	NULL	
job_role	varchar(30)	YES		NULL	

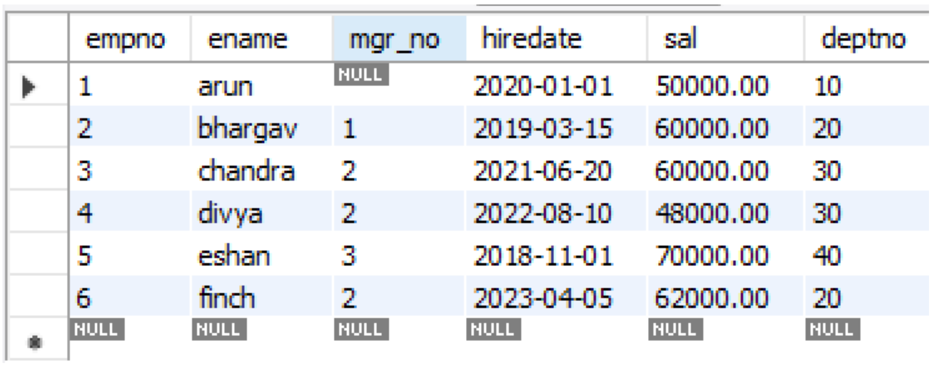
Inserting values into tables:

```
insert into dept values
        (10,'hr','bengaluru'),
         (20,'finance','hyderabad'),
         (30,'it','mysuru'),
         (40, 'admin', 'chennai'),
        (50, 'marketing', 'delhi');
select * from dept;
```



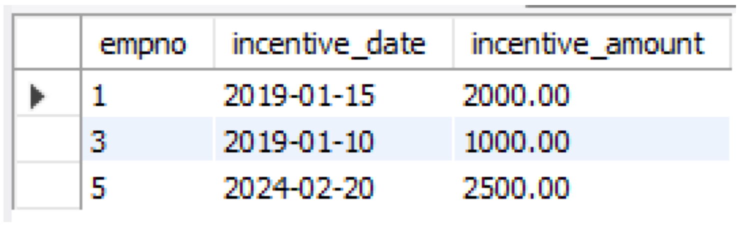
deptno	dname	dloc
10	hr	bengaluru
20	finance	hyderabad
30	it	mysuru
40	admin	chennai
50	marketing	delhi
NULL	NULL	NULL

```
insert into employee values
        (1, 'arun',null,'2020-01-01',50000,10),
        (2,'bhargav',1,'2019-03-15',60000,20),
        (3,'chandra',2,'2021-06-20',60000,30),
        (4,'divya',2,'2022-08-10',48000,30),
        (5,'eshan',3,'2018-11-01',70000,40),
        (6,'finch',2,'2023-04-05',62000,20);

select *  from emp;
```



empno	ename	mgr_no	hiredate	sal	deptno
1	arun	NULL	2020-01-01	50000.00	10
2	bhargav	1	2019-03-15	60000.00	20
3	chandra	2	2021-06-20	60000.00	30
4	divya	2	2022-08-10	48000.00	30
5	eshan	3	2018-11-01	70000.00	40
6	finch	2	2023-04-05	62000.00	20
NULL	NULL	NULL	NULL	NULL	NULL

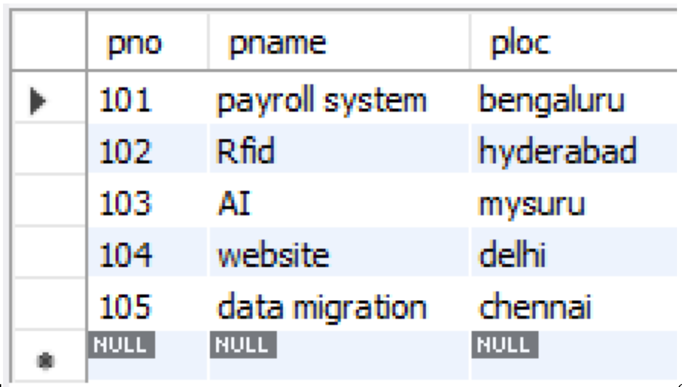
```
insert into incentives values
        (1,'2019-01-15',2000),
        (3,'2019-01-10',1000),
        (5,'2024-02-20',2500);
select * from incentives;
```



empno	incentive_date	incentive_amount
1	2019-01-15	2000.00
3	2019-01-10	1000.00
5	2024-02-20	2500.00

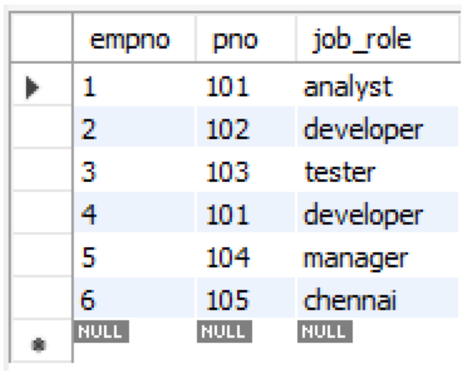
```
insert into project values
        (101, 'payroll system','bengaluru'),
        (102, 'Rfid','hyderabad'),
        (103, 'AI','mysuru'),
        (104, 'website','delhi'),
(105, 'data migration','chennai');
```

```
select * from project;
```



	pno	pname	ploc
▶	101	payroll system	bengaluru
	102	Rfid	hyderabad
	103	AI	mysuru
	104	website	delhi
	105	data migration	chennai
●	NULL	NULL	NULL

```
insert into assignedto values
        (1,101,'analyst'),
        (2,102,'developer'),
        (3,103,'tester'),
        (4,101,'developer'),
        (5,104,'manager'),
        (6,105,'chennai');
select * from assigned_to;
```

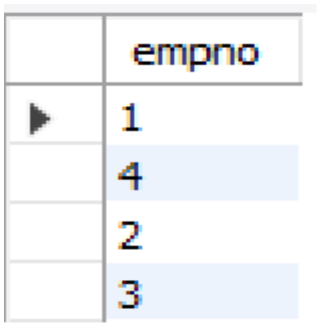


	empno	pno	job_role
▶	1	101	analyst
	2	102	developer
	3	103	tester
	4	101	developer
	5	104	manager
	6	105	chennai
●	NULL	NULL	NULL

Queries:

- **Retrieve the employee numbers of all employees who work on project located in Bengaluru, Hyderabad, or Mysuru**

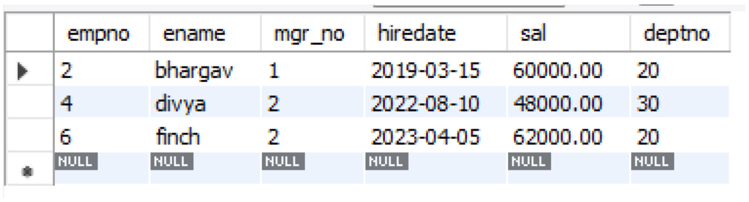
```
select e.empno from employee e
join assignedto a on e.empno=a.empno
join project p on a.pno=p.pno
where p.ploc in ('bengaluru','hyderabad','mysuru');
```



	empno
▶	1
	4
	2
	3

- **Get Employee ID's of those employees who didn't receive incentives.**

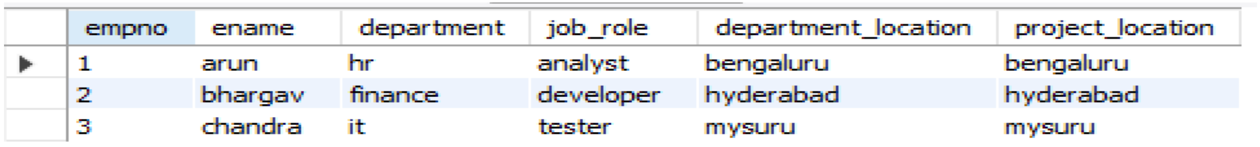
select empno from emp
where empno not in (select empno from incentives);



	empno	ename	mgr_no	hiredate	sal	deptno
▶	2	bhargav	1	2019-03-15	60000.00	20
	4	divya	2	2022-08-10	48000.00	30
	6	finch	2	2023-04-05	62000.00	20
*	NULL	NULL	NULL	NULL	NULL	NULL

- **Write a SQL query to find the employees name, number, dept, job_role, department location and project location who are working for a project location same as his/her department location.**

select e.empno,e.ename,d.dname as department,a.job_role,d.dloc as
department_location,p.ploc as project_location from employee e
join dept d on e.deptno = d.deptno
join assignedto a on e.empno=a.empno
join project p on a.pno=p.pno
where d.dloc =p.ploc;



	empno	ename	department	job_role	department_location	project_location
▶	1	arun	hr	analyst	bengaluru	bengaluru
	2	bhargav	finance	developer	hyderabad	hyderabad
	3	chandra	it	tester	mysuru	mysuru

- **Increase income of all employees by 5% in a table.**

update emp set sal = 1.05*sal;

select * from emp;

More Queries on Employee Database

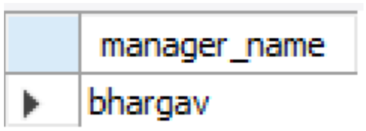
Questions (Week 6)

- Using Scheme diagram (under Program-5), Create tables by properly specifying the primary keys and the foreign keys.
- Enter greater than five tuples for each table.
- List the name of the managers with the maximum employees
- Display those managers name whose salary is more than average salary of his employee.
- Find the name of the second top level managers of each department.
- Find the employee details who got second maximum incentive in January 2019.
- Display those employees who are working in the same department where his manager is working.

Queries:

- **List the name of the managers with the maximum employees**

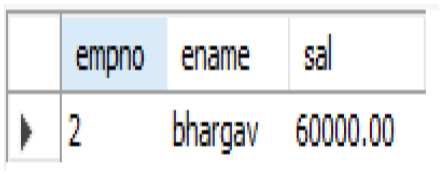
```
select e.ename as manager_name, count(emp.empno) as num_employees from emp e join emp as
emp on e.empno = emp.mgr_no
group by e.ename
having count(emp.empno) = ( select max(employee_count) from ( select
        count(empno) as employee_count from emp
        where mgr_no is not null
        group by mgr_no
    ) as counts);
```



	manager_name
▶	bhargav

- **Display those managers name whose salary is more than average salary of his employee.**

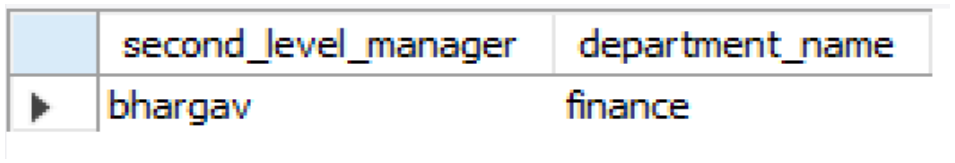
```
select e.empno,e.ename as manager_name, e.sal as manager_salary from emp e
where e.empno in (select mgr_no from emp
    where mgr_no is not null
    group by mgr_no having
    e.sal > avg(sal)
);
```



	empno	ename	sal
▶	2	bhargav	60000.00

- **Find the name of the second top level managers of each department.**

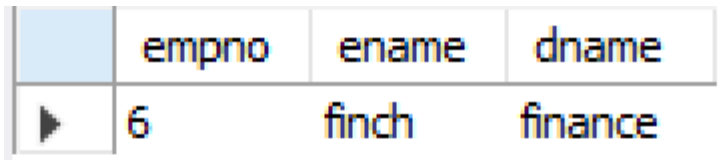
```
select e2.ename as second_level_manager, d.dname as department_name from emp e1
join emp e2 on e1.empno = e2.mgr_no join
dept d on e2.deptno = d.deptno where
e1.mgr_no is null;
```



second_level_manager	department_name
bhargav	finance

- **Display those employees who are working in the same department where his manager is working.**

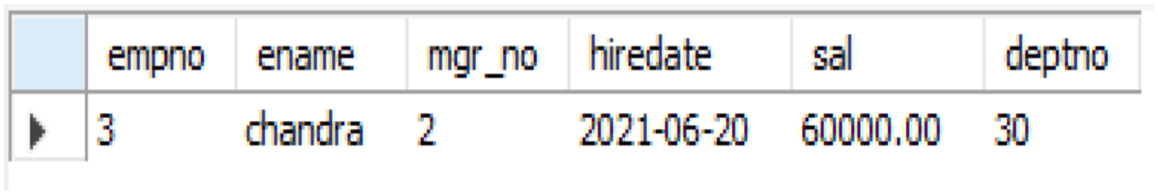
```
select e.empno, e.ename, d.dname
from employee e
join employee m on e.mgr_no = m.empno
join dept d on e.deptno = d.deptno
where e.deptno = m.deptno;
```



empno	ename	dname
6	finch	finance

- **SQL Query to find the employee details who got second maximum incentive in February 2019.**

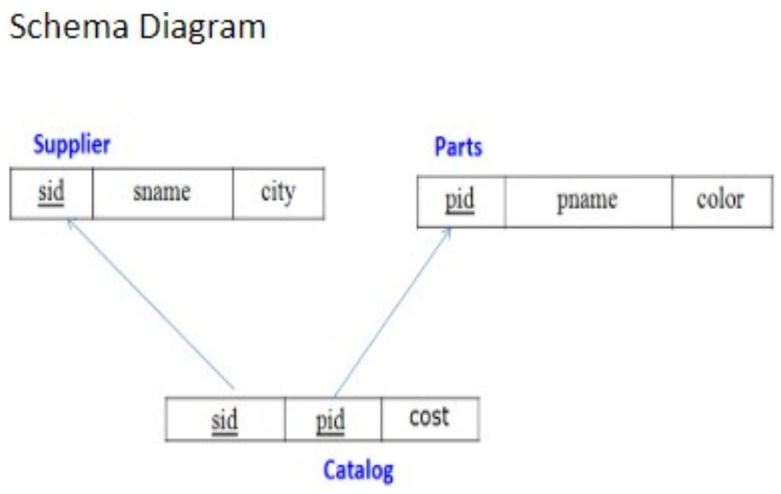
```
select e.ename, i.incentive_amount from emp e join
incentives i on e.empno = i.empno
where i.incentive_date like '2019-02%' and
i.incentive_amount = (
    select incentive_amount
    from incentives
    where incentive_date like '2019-02%' order
    by incentive_amount desc
    limit 1 offset
```



empno	ename	mgr_no	hiredate	sal	deptno
3	chandra	2	2021-06-20	60000.00	30

SUPPLIER DATABASE

Schema Diagram:



Queries (Week 7):

- Using Scheme diagram, create tables by properly specifying the primary keys and the foreign keys. Insert appropriate records in each table.
- 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.

Create Database:

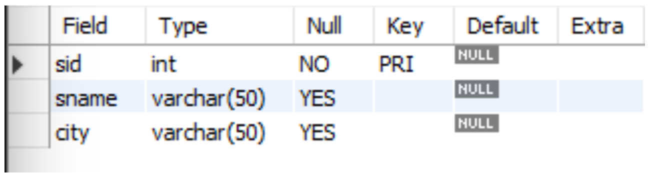
```
create database supplier; use
supplier;
```

Create tables:

```
CREATE TABLE Supplier
    ( sid INT PRIMARY KEY,
    sname VARCHAR(50),
    city VARCHAR(50)
);
CREATE TABLE Parts ( pid
    INT PRIMARY KEY,
    pname VARCHAR(50),
    color VARCHAR(20)
);

CREATE TABLE Catalog
    ( sid INT,
    pid INT,
    cost DECIMAL(10, 2),
    PRIMARY KEY (sid, pid),
    FOREIGN KEY (sid) REFERENCES Supplier(sid),
    FOREIGN KEY (pid) REFERENCES Parts(pid)
);
```

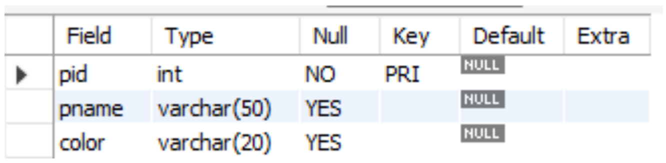
Structure of tables:

desc supplier;



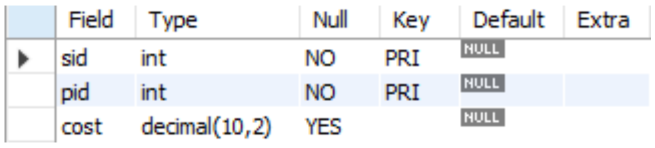
Field	Type	Null	Key	Default	Extra
sid	int	NO	PRI	NULL	
sname	varchar(50)	YES		NULL	
city	varchar(50)	YES		NULL	

desc parts;



Field	Type	Null	Key	Default	Extra
pid	int	NO	PRI	NULL	
pname	varchar(50)	YES		NULL	
color	varchar(20)	YES		NULL	

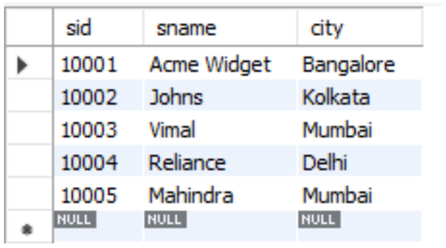
desc catalog;



Field	Type	Null	Key	Default	Extra
sid	int	NO	PRI	NULL	
pid	int	NO	PRI	NULL	
cost	decimal(10,2)	YES		NULL	

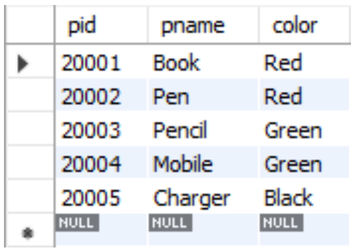
Inserting Values into tables:

```
INSERT INTO Supplier VALUES (10001, 'Acme Widget', 'Bangalore');
INSERT INTO Supplier VALUES (10002, 'Johns', 'Kolkata');
INSERT INTO Supplier VALUES (10003, 'Vimal', 'Mumbai'); INSERT
INTO Supplier VALUES (10004, 'Reliance', 'Delhi'); INSERT INTO
Supplier VALUES (10005, 'Mahindra', 'Mumbai');
select * from supplier;
```



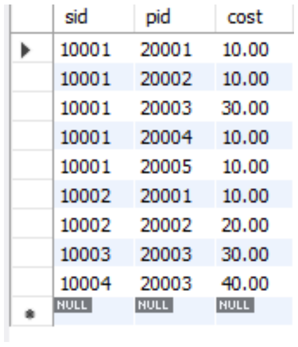
sid	sname	city
10001	Acme Widget	Bangalore
10002	Johns	Kolkata
10003	Vimal	Mumbai
10004	Reliance	Delhi
10005	Mahindra	Mumbai
NULL	NULL	NULL

```
INSERT INTO Parts VALUES (20001, 'Book', 'Red'); INSERT
INTO Parts VALUES (20002, 'Pen', 'Red'); INSERT INTO Parts
VALUES (20003, 'Pencil', 'Green'); INSERT INTO Parts
VALUES (20004, 'Mobile', 'Green'); INSERT INTO Parts
VALUES (20005, 'Charger', 'Black');

select * from parts;
```



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

```
INSERT INTO Catalog VALUES (10001, 20001, 10);
INSERT INTO Catalog VALUES (10001, 20002, 10);
INSERT INTO Catalog VALUES (10001, 20003, 30);
INSERT INTO Catalog VALUES (10001, 20004, 10);
INSERT INTO Catalog VALUES (10001, 20005, 10);
INSERT INTO Catalog VALUES (10002, 20001, 10);
INSERT INTO Catalog VALUES (10002, 20002, 20);
INSERT INTO Catalog VALUES (10003, 20003, 30);
INSERT INTO Catalog VALUES (10004, 20003, 40);

select * from catalog;
```

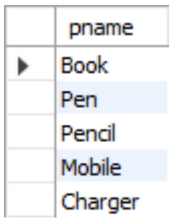


sid	pid	cost
10001	20001	10.00
10001	20002	10.00
10001	20003	30.00
10001	20004	10.00
10001	20005	10.00
10002	20001	10.00
10002	20002	20.00
10003	20003	30.00
10004	20003	40.00
NULL	NULL	NULL

Queries:

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

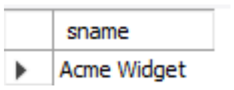
```
select distinct pname from parts  where
pid in (select pid from catalog);
```



pname
Book
Pen
Pencil
Mobile
Charger

- **Find the snames of suppliers who supply every part.**

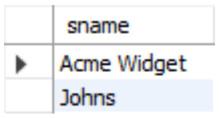
```
select sname from supplier
where not exists (select pid from parts where
pid not in (select pid from catalog where
catalog.sid = supplier.sid));
```



sname
Acme Widget

- **Find the snames of suppliers who supply every red part.**

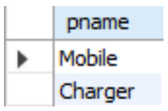
```
select sname from supplier
where not exists (select pid from parts
where color = 'red' and pid not in (select pid from catalog where
catalog.sid = supplier.sid));
```



sname
Acme Widget
Johns

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

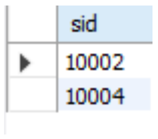
```
select pname from parts
where  pid  in  (  select  pid  from  catalog
where  sid  =  (select  sid  from  supplier
where sname = 'acme widget'))
and pid not in (select pid from catalog
where sid != (select sid from supplier where sname = 'acme widget'));
```



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).**

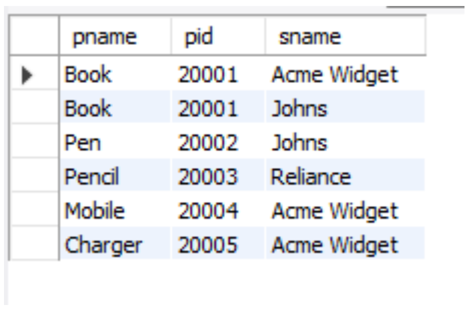
```
select distinct c.sid from catalog c
join (select pid, avg(cost) as avg_cost from catalog group
by pid) avg_table on c.pid = avg_table.pid where c.cost >
avg_table.avg_cost;
```



sid
10002
10004

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

```
select p.pname,p.pid, s.sname from parts p join
catalog c on p.pid = c.pid
join supplier s on c.sid = s.sid
where (p.pid, c.cost) in (select pid, max(cost) from catalog group by
pid);
```



pname	pid	sname
Book	20001	Acme Widget
Book	20001	Johns
Pen	20002	Johns
Pencil	20003	Reliance
Mobile	20004	Acme Widget
Charger	20005	Acme Widget

NoSQL Lab 1

Question

(Week 8)

Perform the following DB operations using MongoDB.

1. Create a database "Student" with the following attributes Rollno, Age, ContactNo, Email-Id.
2. Insert appropriate values
3. Write query to update Email-Id of a student with rollno 10.
4. Replace the student name from "ABC" to "FEM" of rollno 11.
5. Export the created table into local file system
6. Drop the table
7. Import a given csv datasheet from local file system inro collection.

Create database

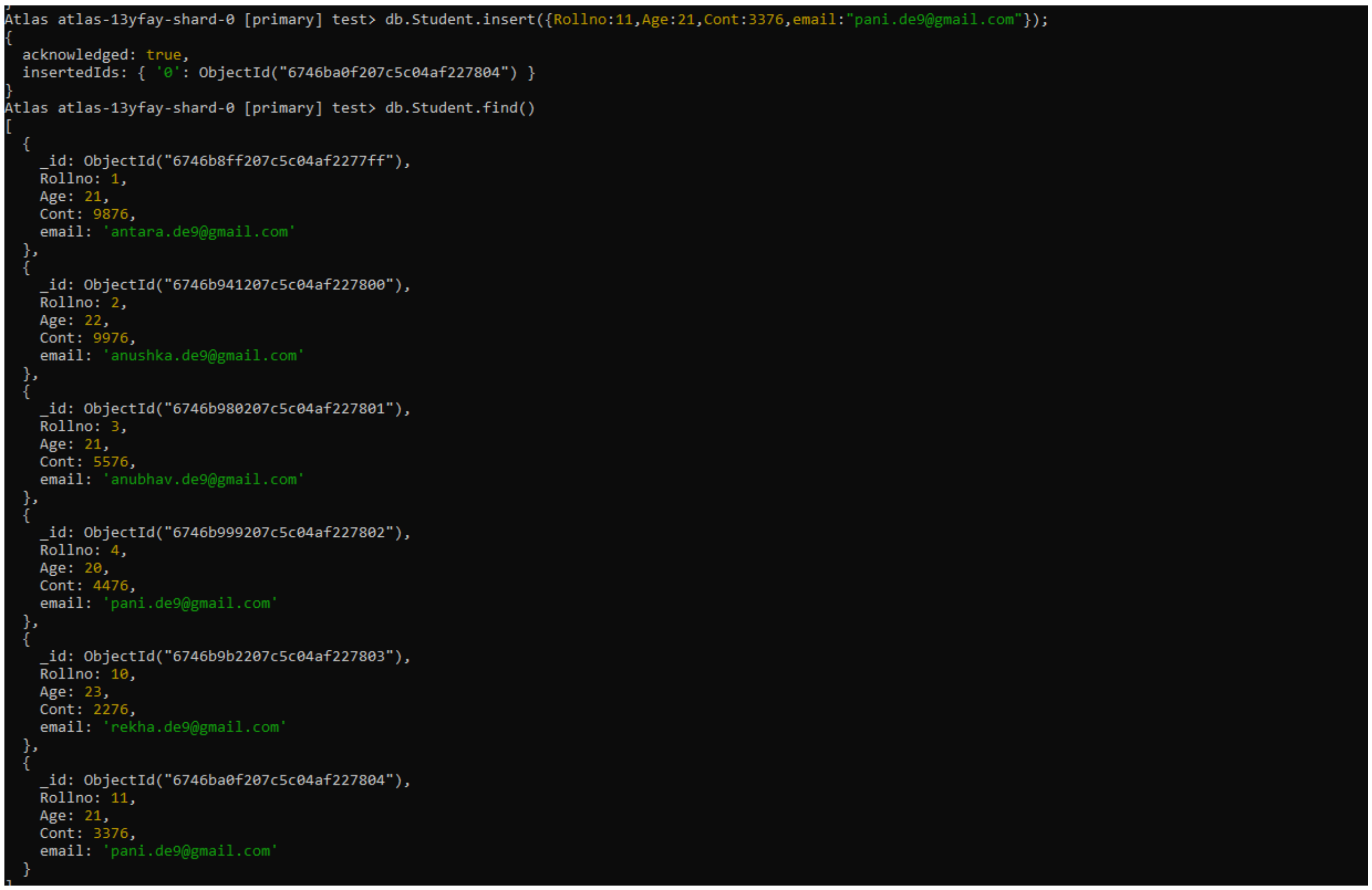
```
db.createCollection("Student");
```

Create table & Inserting Values to the table

```
db.Student.insert({RollNo:1,Age:21,Cont:9876,email:"antara.de9@gmail.com"});
db.Student.insert({RollNo:2,Age:22,Cont:9976,email:"anushka.de9@gmail.com"});
db.Student.insert({RollNo:3,Age:21,Cont:5576,email:"anubhav.de9@gmail.com"});
db.Student.insert({RollNo:4,Age:20,Cont:4476,email:"pani.de9@gmail.com"});
db.Student.insert({RollNo:10,Age:23,Cont:2276,email:"rekha.de9@gmail.com"});
```

Structure of the table

```
db.Student.find();
```

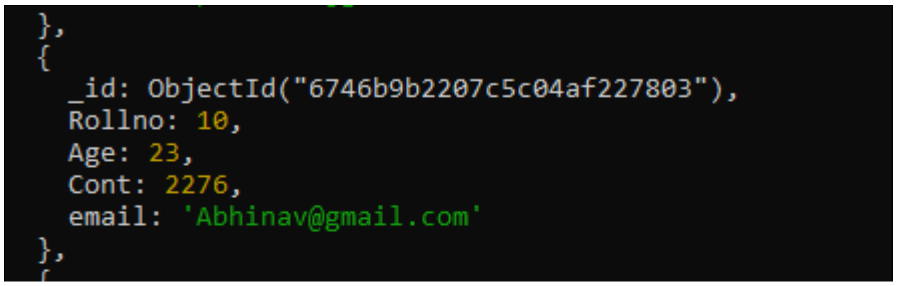


```
Atlas atlas-13yfay-shard-0 [primary] test> db.Student.insert({Rollno:11,Age:21,Cont:3376,email:"pani.de9@gmail.com"});
{
  acknowledged: true,
  insertedIds: { '0': ObjectId("6746ba0f207c5c04af227804") }
}
Atlas atlas-13yfay-shard-0 [primary] test> db.Student.find()
[
  {
    _id: ObjectId("6746b8ff207c5c04af2277ff"),
    Rollno: 1,
    Age: 21,
    Cont: 9876,
    email: 'antara.de9@gmail.com'
  },
  {
    _id: ObjectId("6746b941207c5c04af227800"),
    Rollno: 2,
    Age: 22,
    Cont: 9976,
    email: 'anushka.de9@gmail.com'
  },
  {
    _id: ObjectId("6746b980207c5c04af227801"),
    Rollno: 3,
    Age: 21,
    Cont: 5576,
    email: 'anubhav.de9@gmail.com'
  },
  {
    _id: ObjectId("6746b999207c5c04af227802"),
    Rollno: 4,
    Age: 20,
    Cont: 4476,
    email: 'pani.de9@gmail.com'
  },
  {
    _id: ObjectId("6746b9b2207c5c04af227803"),
    Rollno: 10,
    Age: 23,
    Cont: 2276,
    email: 'rekha.de9@gmail.com'
  },
  {
    _id: ObjectId("6746ba0f207c5c04af227804"),
    Rollno: 11,
    Age: 21,
    Cont: 3376,
    email: 'pani.de9@gmail.com'
  }
```

Queries

• Write a query to update the Email-Id of a student with rollno 5.

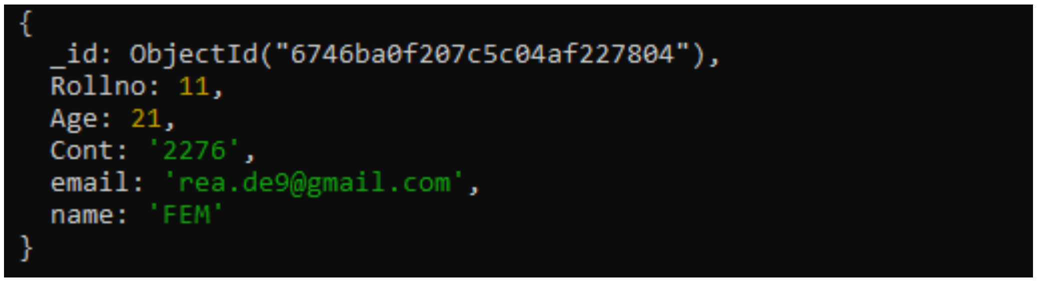
db.Student.update({rollno:5},{$set:{email:"abhinav@gmail.com"}});



```
  },
  {
    _id: ObjectId("6746b9b2207c5c04af227803"),
    Rollno: 10,
    Age: 23,
    Cont: 2276,
    email: 'Abhinav@gmail.com'
  },
```

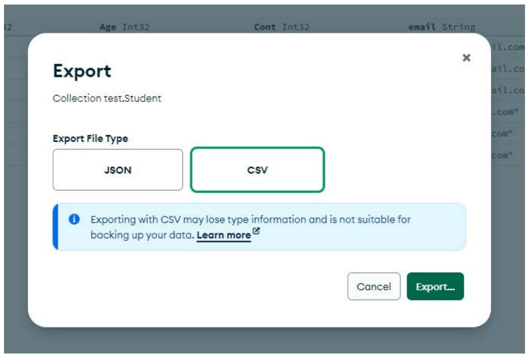
• Replace the student name from "ABC" to "FEM" of rollno 11.

db.Student.insert({rollno:11,age:22,name:"ABC",cont:2276,email:"madhura@gmail.com"});
db.Student.update({rollno:11,name:"ABC"},{$set:{name:"FEM"}})



```
{
  _id: ObjectId("6746ba0f207c5c04af227804"),
  Rollno: 11,
  Age: 21,
  Cont: '2276',
  email: 'rea.de9@gmail.com',
  name: 'FEM'
}
```

- **<u>Export the created table into local files</u>**



Export

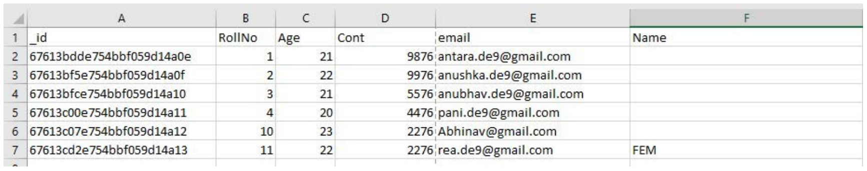
Collection test.Student

Export File Type

JSON [✓ CSV]

Exporting with CSV may lose type information and is not suitable for backing up your data. Learn more

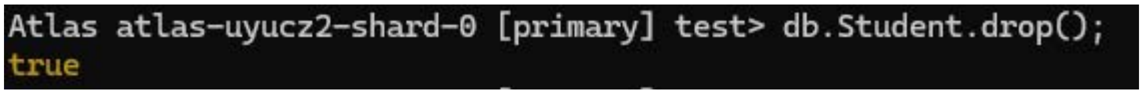
Cancel Export...



	A	B	C	D	E	F
1	_id	RollNo	Age	Cont	email	Name
2	67613bdde754bbf059d14a0e	1	21	9876	antara.de9@gmail.com	
3	67613bf5e754bbf059d14a0f	2	22	9976	anushka.de9@gmail.com	
4	67613bfce754bbf059d14a10	3	21	5576	anubhav.de9@gmail.com	
5	67613c00e754bbf059d14a11	4	20	4476	pani.de9@gmail.com	
6	67613c07e754bbf059d14a12	10	23	2276	Abhinav@gmail.com	
7	67613cd2e754bbf059d14a13	11	22	2276	rea.de9@gmail.com	FEM

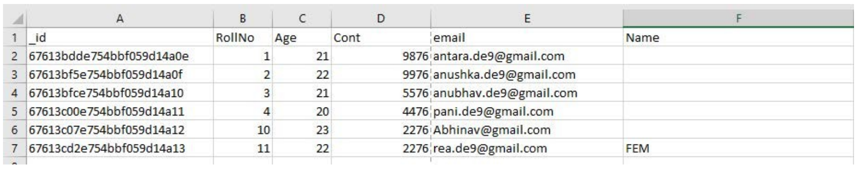
- **<u>Drop the table</u>**

db.Student.drop()

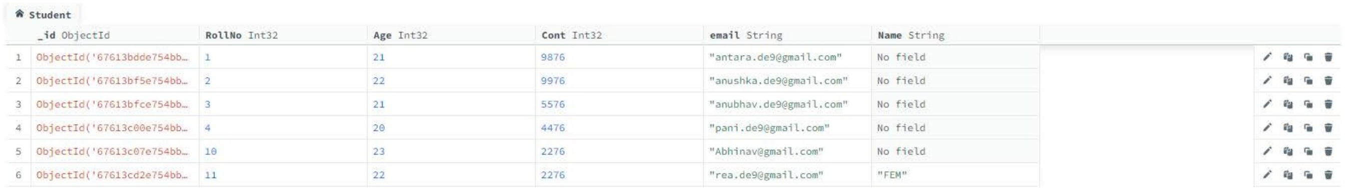


```
Atlas atlas-uyucz2-shard-0 [primary] test> db.Student.drop();
true
```

- **<u>Import a given csv datasheet from local file system into collection.</u>**



	A	B	C	D	E	F
1	_id	RollNo	Age	Cont	email	Name
2	67613bdde754bbf059d14a0e	1	21	9876	antara.de9@gmail.com	
3	67613bf5e754bbf059d14a0f	2	22	9976	anushka.de9@gmail.com	
4	67613bfce754bbf059d14a10	3	21	5576	anubhav.de9@gmail.com	
5	67613c00e754bbf059d14a11	4	20	4476	pani.de9@gmail.com	
6	67613c07e754bbf059d14a12	10	23	2276	Abhinav@gmail.com	
7	67613cd2e754bbf059d14a13	11	22	2276	rea.de9@gmail.com	FEM



Student

	_id ObjectId	RollNo Int32	Age Int32	Cont Int32	email String	Name String
1	ObjectId('67613bdde754bb…	1	21	9876	"antara.de9@gmail.com"	No field
2	ObjectId('67613bf5e754bb…	2	22	9976	"anushka.de9@gmail.com"	No field
3	ObjectId('67613bfce754bb…	3	21	5576	"anubhav.de9@gmail.com"	No field
4	ObjectId('67613c00e754bb…	4	20	4476	"pani.de9@gmail.com"	No field
5	ObjectId('67613c07e754bb…	10	23	2276	"Abhinav@gmail.com"	No field
6	ObjectId('67613cd2e754bb…	11	22	2276	"rea.de9@gmail.com"	"FEM"

NoSQL Lab 2

Question

(Week 9)

Perform the following DB operations using MongoDB.

1. Create a collection by name Customers with the following attributes.

Cust_id, Acc_Bal, Acc_Type

2. Insert at least 5 values into the table

3. Write a query to display those records whose total account balance

is greater than 1200 of account type 'Checking' for each customer_id.

4. Determine Minimum and Maximum account balance for each

customer_id.

5. Export the created collection into local file system

6. Drop the table

7. Import a given csv dataset from local file system into mongodb

collection.

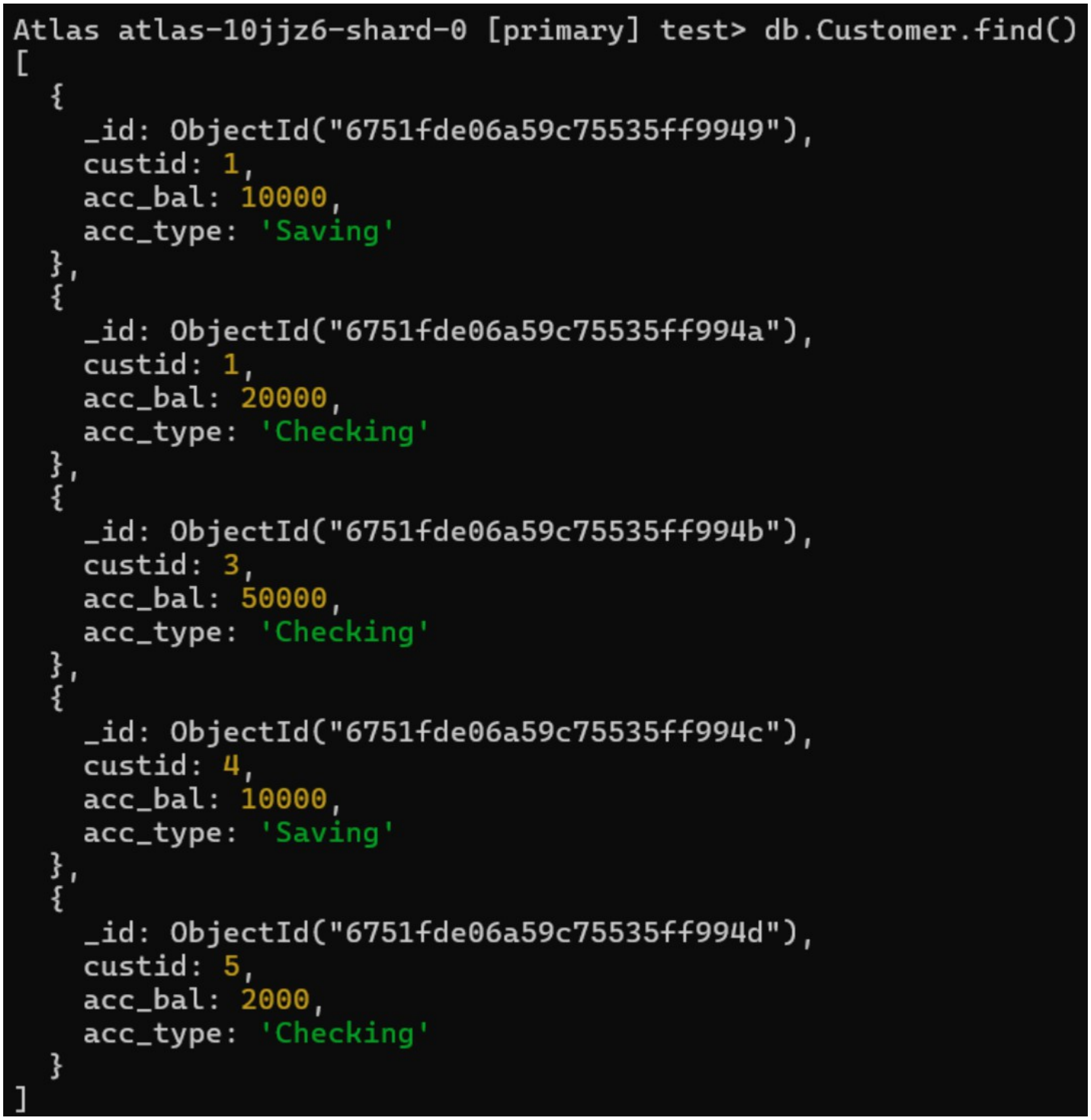
Create Table:

```
db.createCollection("Customer");
```

Inserting Values:

```
db.Customer.insertMany([{custid: 1, acc_bal:10000, acc_type: "Saving"}, {custid: 1, acc_bal:20000, acc_type: "Checking"}, {custid: 3, acc_bal:50000, acc_type: "Checking"}, {custid: 4, acc_bal:10000, acc_type: "Saving"}, {custid: 5, acc_bal:2000, acc_type: "Checking"}]);
```

```
db.Customer.find()
```

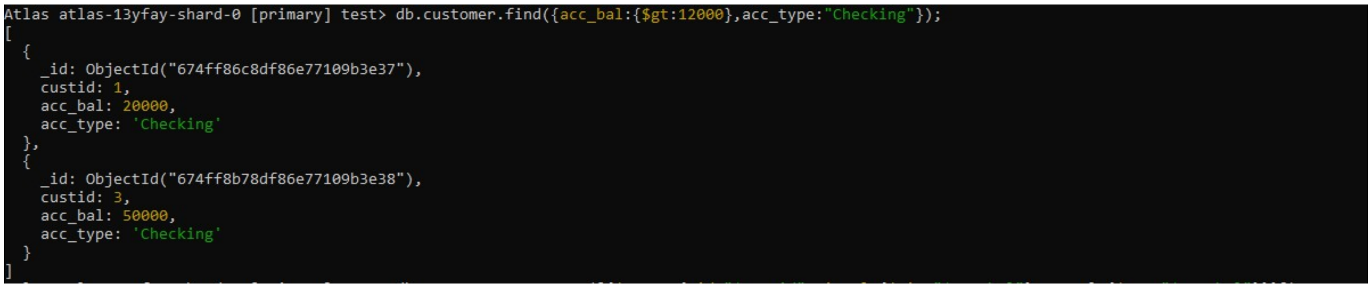


```
Atlas atlas-10jjz6-shard-0 [primary] test> db.Customer.find()
[
  {
    _id: ObjectId("6751fde06a59c75535ff9949"),
    custid: 1,
    acc_bal: 10000,
    acc_type: 'Saving'
  },
  {
    _id: ObjectId("6751fde06a59c75535ff994a"),
    custid: 1,
    acc_bal: 20000,
    acc_type: 'Checking'
  },
  {
    _id: ObjectId("6751fde06a59c75535ff994b"),
    custid: 3,
    acc_bal: 50000,
    acc_type: 'Checking'
  },
  {
    _id: ObjectId("6751fde06a59c75535ff994c"),
    custid: 4,
    acc_bal: 10000,
    acc_type: 'Saving'
  },
  {
    _id: ObjectId("6751fde06a59c75535ff994d"),
    custid: 5,
    acc_bal: 2000,
    acc_type: 'Checking'
  }
]
```

Queries:

- **Finding all checking accounts with balance greater than 12000**

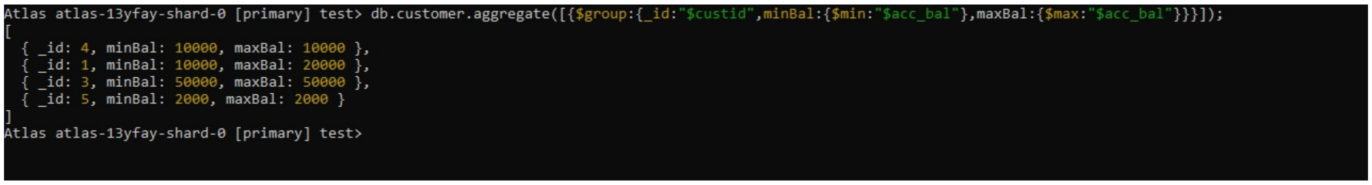
db.Customer.find({acc_bal: {$gt: 12000}, acc_type:"Checking"});



```
Atlas atlas-13yfay-shard-0 [primary] test> db.customer.find({acc_bal:{$gt:12000},acc_type:"Checking"});
[
  {
    _id: ObjectId("674ff86c8df86e77109b3e37"),
    custid: 1,
    acc_bal: 20000,
    acc_type: 'Checking'
  },
  {
    _id: ObjectId("674ff8b78df86e77109b3e38"),
    custid: 3,
    acc_bal: 50000,
    acc_type: 'Checking'
  }
]
```

- **Finding the maximum and minimum balance of each customer**

db.Customer.aggregate([{$group:{_id:"$custid", minBal:{$min:"$acc_bal"}, maxBal: {$max:"$acc_bal"}}}]);



```
Atlas atlas-13yfay-shard-0 [primary] test> db.customer.aggregate([{$group:{_id:"$custid",minBal:{$min:"$acc_bal"},maxBal:{$max:"$acc_bal"}}}]);
[
  { _id: 4, minBal: 10000, maxBal: 10000 },
  { _id: 1, minBal: 10000, maxBal: 20000 },
  { _id: 3, minBal: 50000, maxBal: 50000 },
  { _id: 5, minBal: 2000, maxBal: 2000 }
]
Atlas atlas-13yfay-shard-0 [primary] test>
```

- **Dropping collection “Customer”**

db.Customer.drop();

NoSQL Lab 3

Question

(Week 10)

1. Write a MongoDB query to display all the documents in the collection restaurants.
2. Write a MongoDB query to arrange the name of the restaurants in descending along with all the columns.
3. Write a MongoDB query to find the restaurant Id, name, town and cuisine for those restaurants which achieved a score which is not more than 10.
4. Write a MongoDB query to find the average score for each restaurant.
5. Write a MongoDB query to find the name and address of the restaurants that have a zipcode that starts with '10'.

Creating Table:

```
db.createCollection("restaurants");
```

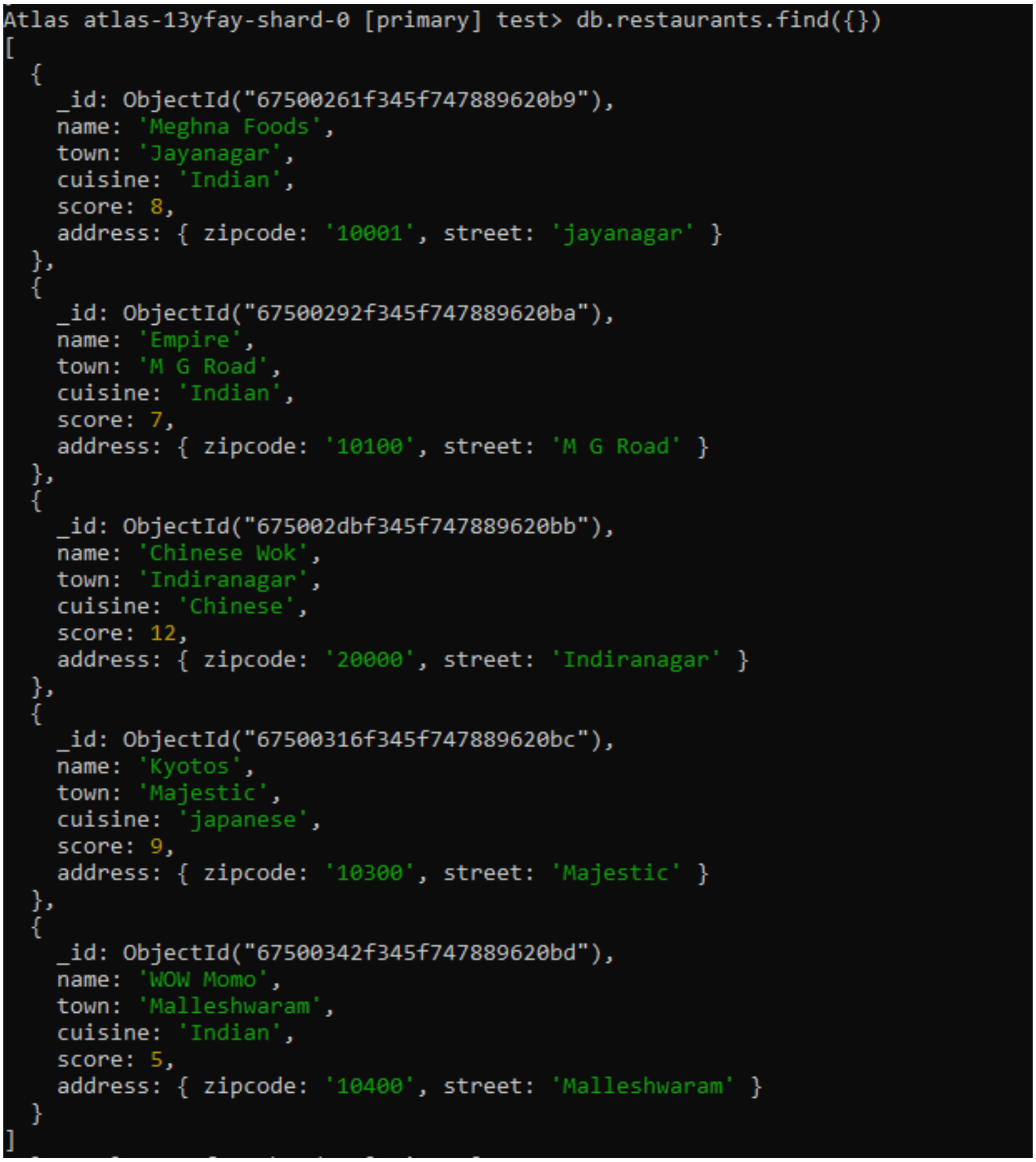
Inserting Values:

```
db.restaurants.insertMany([
{ name: "Meghna Foods", town: "Jayanagar", cuisine: "Indian", score: 8, address: { zipcode: "10001",
street: "Jayanagar“
 } },
{ name: "Empire", town: "MG Road", cuisine: "Indian", score: 7, address: { zipcode: "10100", street: "MG
Road" } },
{ name: "Chinese WOK", town: "Indiranagar", cuisine: "Chinese", score: 12, address: { zipcode: "20000",
street: "Indiranagar" } },
{ name: "Kyotos", town: "Majestic", cuisine: "Japanese", score: 9, address: { zipcode: "10300", street:
"Majestic" } },
```

{ name: "WOW Momos", town: "Malleshwaram", cuisine: "Indian", score: 5, address: { zipcode: "10400", street: "Malleshwaram" }
}])

QUERIES

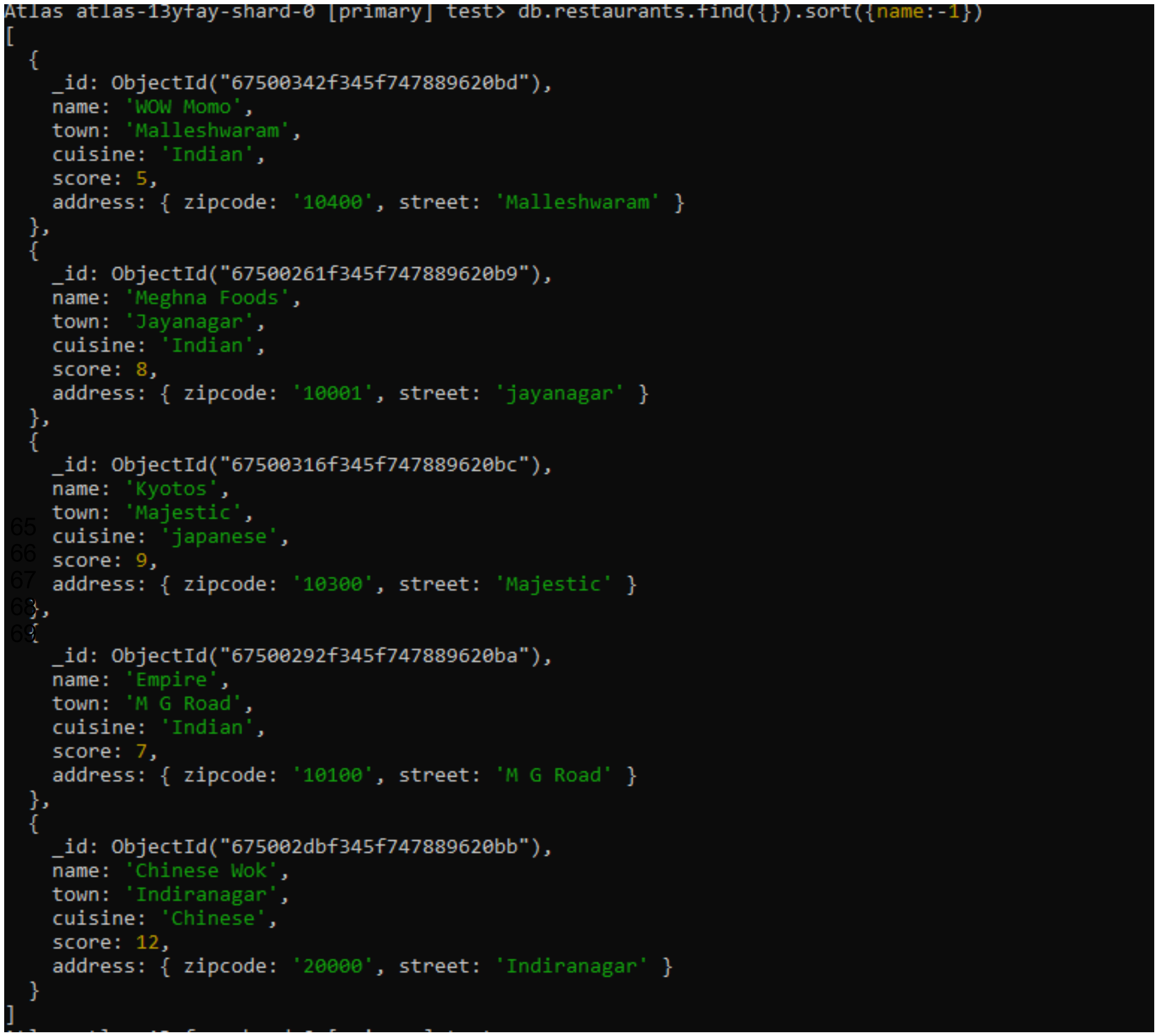
1) db.Restraunt.find()



```
Atlas atlas-13yfay-shard-0 [primary] test> db.restaurants.find({})
[
  {
    _id: ObjectId("67500261f345f747889620b9"),
    name: 'Meghna Foods',
    town: 'Jayanagar',
    cuisine: 'Indian',
    score: 8,
    address: { zipcode: '10001', street: 'jayanagar' }
  },
  {
    _id: ObjectId("67500292f345f747889620ba"),
    name: 'Empire',
    town: 'M G Road',
    cuisine: 'Indian',
    score: 7,
    address: { zipcode: '10100', street: 'M G Road' }
  },
  {
    _id: ObjectId("675002dbf345f747889620bb"),
    name: 'Chinese Wok',
    town: 'Indiranagar',
    cuisine: 'Chinese',
    score: 12,
    address: { zipcode: '20000', street: 'Indiranagar' }
  },
  {
    _id: ObjectId("67500316f345f747889620bc"),
    name: 'Kyotos',
    town: 'Majestic',
    cuisine: 'japanese',
    score: 9,
    address: { zipcode: '10300', street: 'Majestic' }
  },
  {
    _id: ObjectId("67500342f345f747889620bd"),
    name: 'WOW Momo',
    town: 'Malleshwaram',
    cuisine: 'Indian',
    score: 5,
    address: { zipcode: '10400', street: 'Malleshwaram' }
  }
]
```

2) <u>Query to arrange the name of the restaurants in descending along with all the columns.</u>

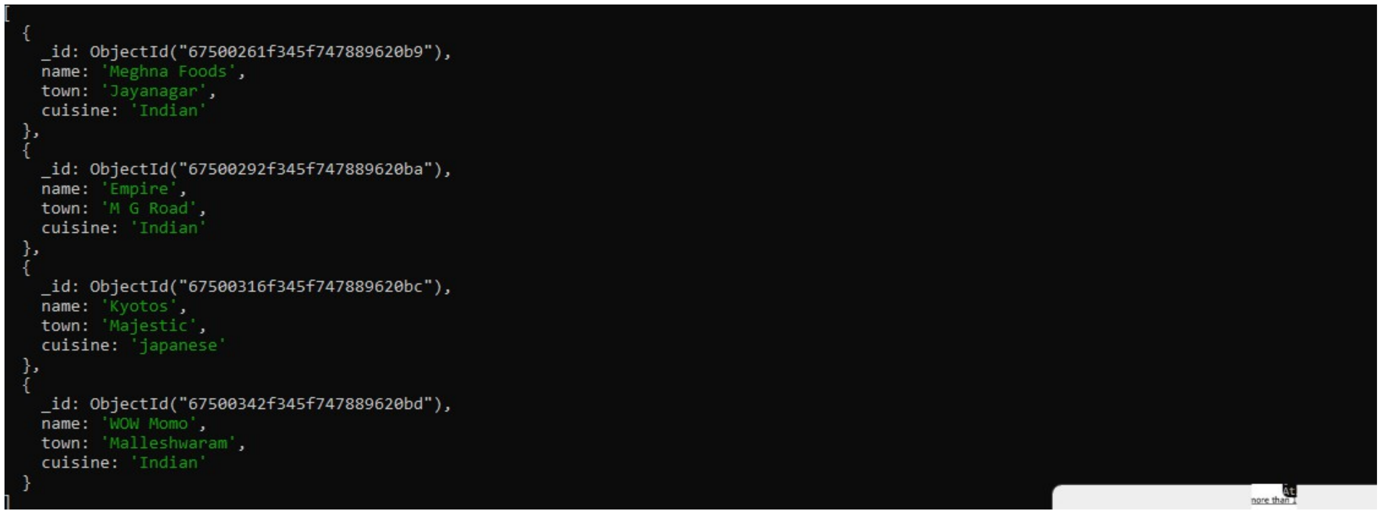
db.restaurants.find({}).sort({ name: -1 })



```
Atlas atlas-13yfay-shard-0 [primary] test> db.restaurants.find({}).sort({name:-1})
[
  {
    _id: ObjectId("67500342f345f747889620bd"),
    name: 'WOW Momo',
    town: 'Malleshwaram',
    cuisine: 'Indian',
    score: 5,
    address: { zipcode: '10400', street: 'Malleshwaram' }
  },
  {
    _id: ObjectId("67500261f345f747889620b9"),
    name: 'Meghna Foods',
    town: 'Jayanagar',
    cuisine: 'Indian',
    score: 8,
    address: { zipcode: '10001', street: 'jayanagar' }
  },
  {
    _id: ObjectId("67500316f345f747889620bc"),
    name: 'Kyotos',
    town: 'Majestic',
    cuisine: 'japanese',
    score: 9,
    address: { zipcode: '10300', street: 'Majestic' }
  },
  {
    _id: ObjectId("67500292f345f747889620ba"),
    name: 'Empire',
    town: 'M G Road',
    cuisine: 'Indian',
    score: 7,
    address: { zipcode: '10100', street: 'M G Road' }
  },
  {
    _id: ObjectId("675002dbf345f747889620bb"),
    name: 'Chinese Wok',
    town: 'Indiranagar',
    cuisine: 'Chinese',
    score: 12,
    address: { zipcode: '20000', street: 'Indiranagar' }
  }
]
```

3) Query to find the restaurant Id, name, town and cuisine for those restaurants which achieved a score which is not more than 10

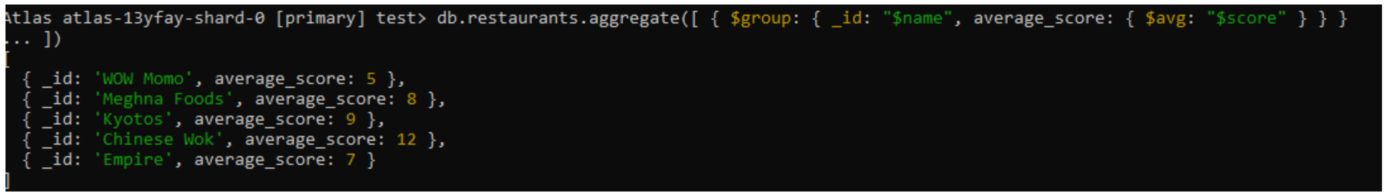
db.restaurants.find({ "score": { $lte: 10 } }, { _id: 1, name: 1, town: 1, cuisine: 1 })



```
[
  {
    _id: ObjectId("67500261f345f747889620b9"),
    name: 'Meghna Foods',
    town: 'Jayanagar',
    cuisine: 'Indian'
  },
  {
    _id: ObjectId("67500292f345f747889620ba"),
    name: 'Empire',
    town: 'M G Road',
    cuisine: 'Indian'
  },
  {
    _id: ObjectId("67500316f345f747889620bc"),
    name: 'Kyotos',
    town: 'Majestic',
    cuisine: 'japanese'
  },
  {
    _id: ObjectId("67500342f345f747889620bd"),
    name: 'WOW Momo',
    town: 'Malleshwaram',
    cuisine: 'Indian'
  }
]
```

4)Query to find the average score for each restaurant

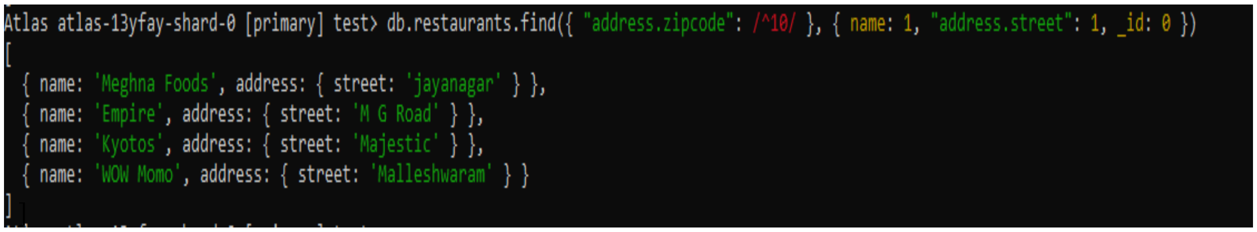
db.restaurants.aggregate([{ $group: { _id: "$name", average_score: { $avg: "$score" } } }])



```
Atlas atlas-13yfay-shard-0 [primary] test> db.restaurants.aggregate([ { $group: { _id: "$name", average_score: { $avg: "$score" } } }
... ])
[
  { _id: 'WOW Momo', average_score: 5 },
  { _id: 'Meghna Foods', average_score: 8 },
  { _id: 'Kyotos', average_score: 9 },
  { _id: 'Chinese Wok', average_score: 12 },
  { _id: 'Empire', average_score: 7 }
]
```

5) Query to find the name and address of the restaurants that have a zipcode that starts with '10'.

db.restaurants.find({ "address.zipcode": /^10/ }, { name: 1, "address.street": 1, _id: 0 })



```
Atlas atlas-13yfay-shard-0 [primary] test> db.restaurants.find({ "address.zipcode": /^10/ }, { name: 1, "address.street": 1, _id: 0 })
[
  { name: 'Meghna Foods', address: { street: 'jayanagar' } },
  { name: 'Empire', address: { street: 'M G Road' } },
  { name: 'Kyotos', address: { street: 'Majestic' } },
  { name: 'WOW Momo', address: { street: 'Malleshwaram' } }
]
```