VISVESVARAYA TECHNOLOGICAL UNIVERSITY

"JnanaSangama", Belgaum -590014, Karnataka.

LAB REPORT
on

Database Management Systems (23CS3PCDBM)

Submitted by

G M Kusuma (1BM24CS405)

in partial fulfillment 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-2024 to Jan-2025

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 **G M Kusuma (1BM24CS405),** who is bonafide student of **B. M. S. College of Engineering.** It is in partial fulfillment 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.

Kayarvizhy Professor Department of CSE, BMSCE	Dr. Kavitha Sooda Professor & HOD Department of CSE, BMSCE

Index

Insurance Database

Question

(Week 01)

- 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 'K A031181') for which the accident report number was 12.

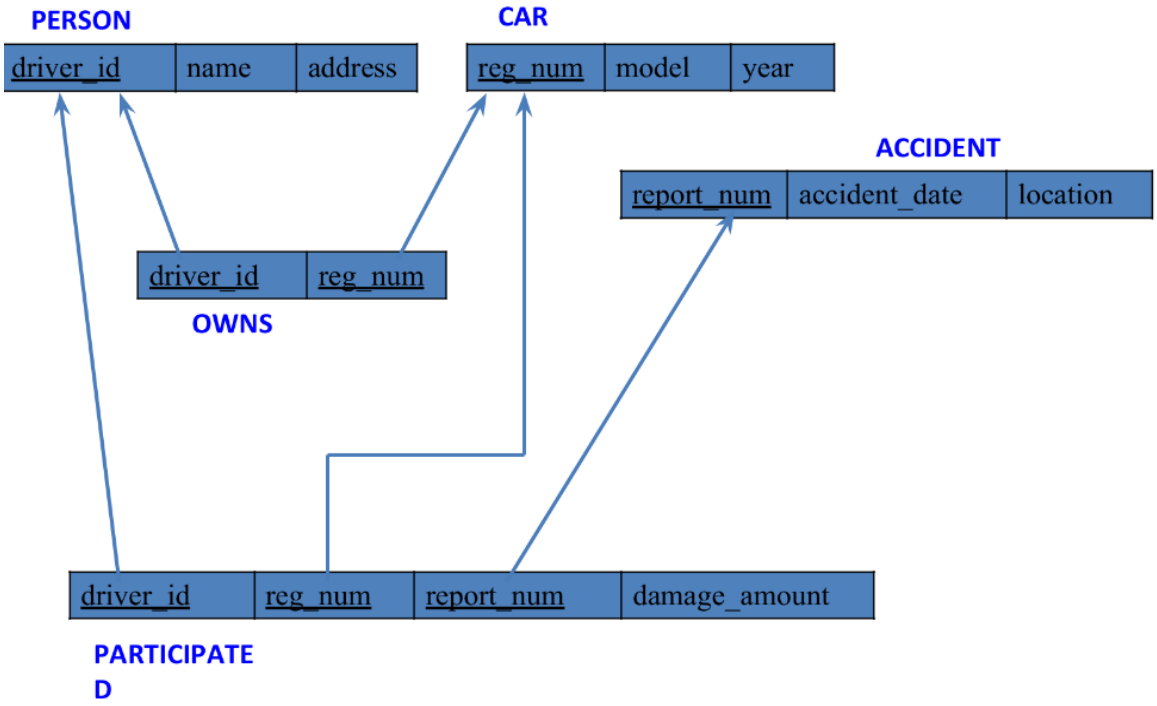
- Add a new accident to the database.

- 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 database

create database insurances_402;
use insurances_402;

Create table

create table person(
driver_id varchar(3) **primary key,**
name varchar(20) **not null**,
address varchar(100)
);

create table car(
reg_no char(8) **primary key,**
model varchar(20),
year int(4) **not null**
);

```
create table accident(
report_no int(4) primary key,
accident_date date,
location varchar(100)
);

create table owns(
driver_id varchar(3),
reg_no char(8),
foreign key(driver_id) references person(driver_id),
foreign key(reg_no) references car(reg_no)
);

create table participated(
driver_id varchar(3),
reg_no char(8),
report_no int(4),
damage_amt int,
foreign key(driver_id) references person(driver_id),
foreign key(reg_no) references car(reg_no),
foreign key (report_no) references accident(report_no)
);
```

Person table :

Result Grid | Filter Rows: | Export: | Wr

Field	Type	Null	Key	Default	Extra
driver_id	varchar(3)	NO	PRI	NULL	
name	varchar(20)	NO		NULL	
address	varchar(100)	YES		NULL	

Car table :

Result Grid | Filter Rows: | Export:

Field	Type	Null	Key	Default	Extra
reg_no	char(8)	NO	PRI	NULL	
model	varchar(20)	YES		NULL	
year	int	NO		NULL	

Accident table :

Result Grid | Filter Rows: | Export: | Wrap C

Field	Type	Null	Key	Default	Extra
report_no	int	NO	PRI	NULL	
accident_date	date	YES		NULL	
location	varchar(100)	YES		NULL	

Owns table :

Result Grid | Filter Rows: | Export:

Field	Type	Null	Key	Default	Extra
driver_id	varchar(3)	YES	MUL	NULL	
reg_no	char(8)	YES	MUL	NULL	

Participated table :

Result Grid | Filter Rows: | Export: | Wr

Field	Type	Null	Key	Default	Extra
driver_id	varchar(3)	YES	MUL	NULL	
reg_no	char(8)	YES	MUL	NULL	
report_no	int	YES	MUL	NULL	
damage_amt	int	YES		NULL	

Inserting Values into the table

insert into person values("A01","kusuma", "tyagaraj nagar");
insert into person values("A02","salma", " M K nagar");
insert into person values("A03","jayshree", "Ashok nagar");
insert into person values("A04","chintu", "Naa Roai Colony");
insert into person values("A05","Johnn", "hanumanth nagar");
select * from person;

Result Grid | Filter Rows: | Edit:

driver_id	name	address
A01	kusuma	tyagaraj nagar
A02	salma	M K nagar
A03	jayshree	Ashok nagar
A04	chintu	Naa Roai Colony
A05	Johnn	hanumanth nagar
NULL	NULL	NULL

hanumanth nagar

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;

Result Grid | Filter Rows: | Edit:

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

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

Result Grid | Filter Rows: | Edit:

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

insert into accident values(11,'2001-01-01',"Mysore Road");
insert into accident values(12,'2002-02-02',"South end Circle");
insert into accident values(13,'2003-01-21',"Bull temple Road");
insert into accident values(14,'2004-12-17',"Mysore Road");
insert into accident values(15,'2005-03-05',"Kanakpura Road");
select * from accident;

Result Grid | Filter Rows: | Edit:

report_num	accident_date	location
11	2001-01-01	Mysore Road
13	2003-01-21	Bull temple Road
14	2004-12-17	Mysore Road
15	2005-03-05	Kanakpura Road
NULL	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;

Result Grid | Filter Rows: | Edit:

driver_id	reg_num	report_num	damage_amount
A01	KA052250	11	10000
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 (example 'KA053408') for which the accident report number was 12.

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

select * from participated;

Result Grid | Filter Rows: | Edit:

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

- Find the total number of people who owned cars that 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 '2001%';

Result Grid | Filter Rows: | Export:

	CNT
▶	1

- Add a new accident to the database.

insert into accident values(16,'2003-03-08',"Domlur");

select * from accident;

Result Grid | Filter Rows: | Edit:

	report_num	accident_date	location
▶	11	2001-01-01	Mysore Road
	13	2003-01-21	Bull temple Road
	14	2004-12-17	Mysore Road
	15	2005-03-05	Kanakpura Road
*	NULL	NULL	NULL

TO DO:

- **DISPLAY ACCIDENT DATE AND LOCATION**

select accident_date **as** date, location **from** accident;

Result Grid | Filter Rows:

	date	location
▶	2001-01-03	Mysore Rd
	2002-02-04	SE Circle
	2021-01-03	Bull Temple Rd
	2017-02-08	Mysore Rd
	2004-03-05	KR Puram

Mysore Rd

● **DISPLAY DRIVER ID WHO DID ACCIDENT WITH DAMAGE AMOUNT GREATER THAN OR EQUAL TO RS.25000**

Select participated.driver_id as driver_id from accident,participated **where** accident.report_no = participated.report_no and participated.damage_amt >= 25000;

Result Grid | Filter Rows:

driver_id
A02
A03

More Queries on Insurance Database

Question

(Week 02)

- 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 'K A031181') for which the accident report number was 12.

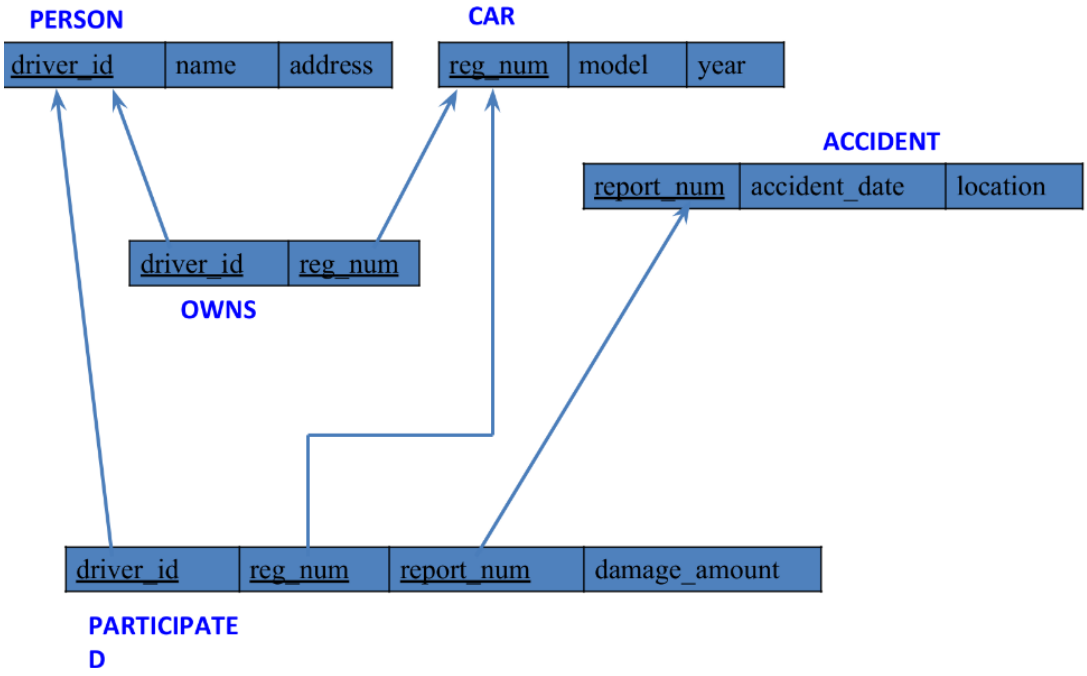
- Add a new accident to the database.

- 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



Queries

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

select * from car **order by** year asc;

Result Grid | Filter Rows:

reg_no	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 model, **count**(**model**) **from** participated, car **where** participated.reg_no = car.reg_no **group by** model;

Result Grid | Filter Rows:

model	count(model)
Lancer	1
Audi	1
Indica	1
Honda	1
Toyota	1

TO DO:

● **FIND THE AVERAGE DAMAGE AMOUNT**

select avg(damage_amout) **as** average **from** participated;

Result Grid | Filter Rows:

average
18600.0000

● **DELETE THE TUPLE WHOSE DAMAGE AMOUNT IS BELOW THE AVERAGE DAMAGE AMOUNT**

delete from participated **where** damage_amt < (select * from (select **avg**(damage_amount) **from** participated) **as** average);

Result Grid | Filter Rows:

average
18600.0000

● **LIST THE NAME OF DRIVERS WHOSE DAMAGE IS GREATER THAN THE AVERAGE DAMAGE AMOUNT.**

select name from person, participated **where** person.driver_id = participated.driver_id and participated.damage_amount > (select **avg**(damage_amount) from participated);

Result Grid | Filter Rows:

name
Pradeep
Smith

● **FIND MAXIMUM DAMAGE AMOUNT.**

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

Result Grid | Filter Rows:

max(damage_amt)
50000

Bank Database

Question

(Week 03)

- 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)

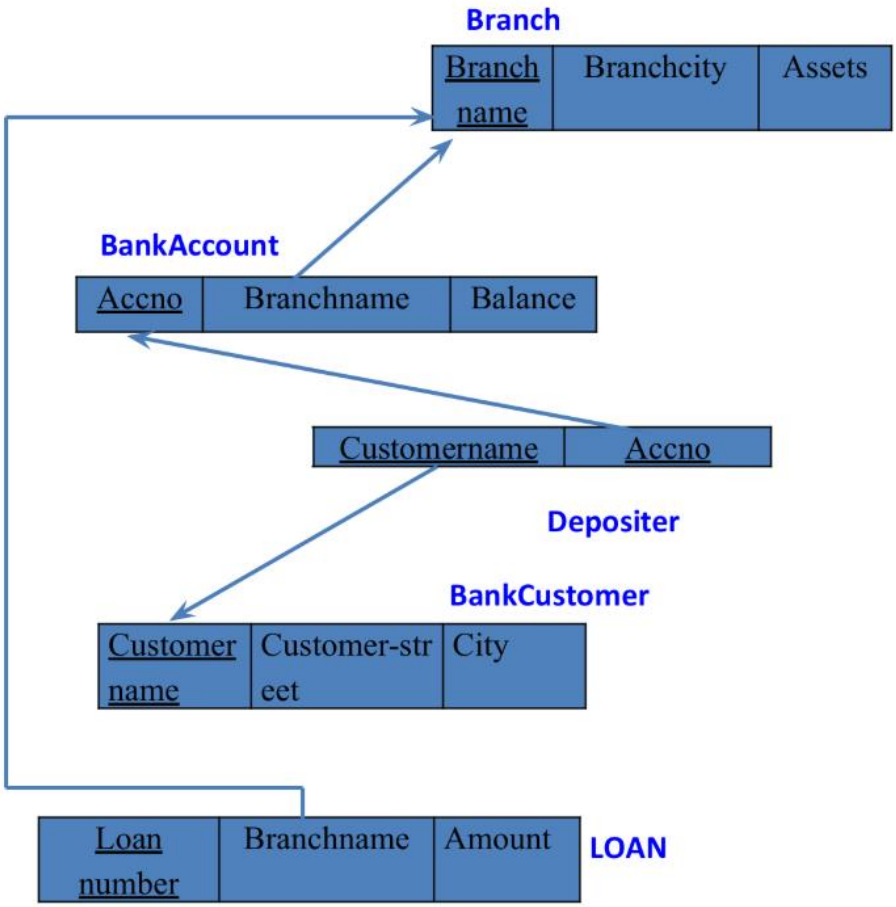
- Create the above tables by properly specifying the primary keys and the foreign keys. - Enter at least five tuples for each relation.

- 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.

Schema Diagram



Create database

create database bank_402;
use bank_402;

Create table

create table Branch(
branchname varchar(20),
city varchar(20),
assets varchar(20),
primary key(branchname));

desc Branch;

```
create table Bankaccount(
accno int,
branchname varchar(20),
balance varchar(20),
primary key (accno),
foreign key(branchname) references Branch(branchname));

desc Bankaccount;

create table bankcustomer(
customername varchar(20),
customerstreet varchar(20),
customercity varchar(20),
primary key(customername));

desc bankcustomer;


create table depositer(
customername varchar(20),
accno int,
primary key(customername, accno),
foreign key(customername)references bankcustomer(customername),
foreign key(accno)references Bankaccount(accno));

desc depositer;


create table loan(
loannumber int,
branchname varchar(20),
amount int,
primary key(loannumber),
foreign key(branchname)references Branch(branchname));

desc loan;

create table Borrower(
customername varchar(20),
loannumber int,
Primary key(customername,loannumber),
foreign key(loannumber)references loan_402(loannumber),
foreign key(customername) references bankcustomer_402(customername));

Desc Borrower;
```

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

Field	Type	Null	Key	Default	Extra
branchname	varchar(20)	NO	PRI	NULL	
city	varchar(20)	YES		NULL	
assets	varchar(20)	YES		NULL	

Result Grid | Filter Rows: | Export: | W

Field	Type	Null	Key	Default	Extra
accno	int	NO	PRI	NULL	
branchname	varchar(20)	YES	MUL	NULL	
balance	varchar(20)	YES		NULL	

Result Grid | Filter Rows: | Export: | Wra

Field	Type	Null	Key	Default	Extra
customername	varchar(20)	NO	PRI	NULL	
customerstreet	varchar(20)	YES		NULL	
customercity	varchar(20)	YES		NULL	

Result Grid | Filter Rows: | Export: | Wrap

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

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

Field	Type	Null	Key	Default	Extra
loannumber	int	NO	PRI	NULL	
branchname	varchar(20)	YES	MUL	NULL	
amount	int	YES		NULL	

Result Grid | Filter Rows: | Export: | Wrap

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

Inserting the values

insert into Branch values('SBI_Chamrajpete', 'Bangalore', 50000);
insert into Branch values('SBI_Residency_road', 'Bangalore',10000);
insert into Branch values('SBI_Shivaji_road', 'Bombay', 20000);
insert into Branch values('SBI_Parliament_road','Delhi', 10000);
insert into Branch values('SBI_Jantarmantar', 'Delhi',20000);
insert into Branch values('SBI_Mantrimarg','Delhi',150000);
select * from Branch;

Result Grid | Filter Rows: | E

branchname	city	assets
SBI_Chamrajpete	Bangalore	50000
SBI_Jantarmantar	Delhi	20000
SBI_Mantrimarg	Delhi	150000
SBI_Parliament_road	Delhi	10000
SBI_Residency_road	Bangalore	10000
SBI_Shivaji_road	Bombay	20000
NULL	NULL	NULL

insert into Bankaccount values(1, 'SBI_Chamrajpete',2000);
insert into Bankaccount values(2,'SBI_Residency_road', 5000);
insert into Bankaccount values(3,'SBI_Shivaji_road', 6000);

```
insert into Bankaccount values(4, 'SBI_Parliament_road', 9000);
insert into Bankaccount values(5, 'SBI_Jantarmantar', 8000);
insert into Bankaccount values(6, 'SBI_Shivaji_road', 4000);
insert into Bankaccount values(8, 'SBI_Residency_road', 4000);
insert into Bankaccount values(9, 'SBI_Parliament_road',  3000);
insert into Bankaccount values(10, 'SBI_Residency_road', 5000);
insert into Bankaccount values(11, 'SBI_Jantarmantar', 2000);
insert into Bankaccount values(12, 'SBI_Mantrimarg',2000);
select * from Bankaccount;
```

Result Grid | Filter Rows:

accno	branchname	balance
1	SBI_Chamrajpete	2000
2	SBI_Residency_road	5000
3	SBI_Shivaji_road	6000
4	SBI_Parliament_road	9000
5	SBI_Jantarmantar	8000
6	SBI_Shivaji_road	4000
8	SBI_Residency_road	4000
9	SBI_Parliament_road	3000
10	SBI_Residency_road	5000
11	SBI_Jantarmantar	2000
12	SBI_Mantrimarg	2000
NULL	NULL	NULL

```
insert into bankcustomer values('Avinash','Bulltemple_road','Bangalore');
insert into bankcustomer values('Dinesh', 'Bannerghatta_road','Bangalore');
insert into bankcustomer values('Mohan', 'National_college','Bangalore');
insert into bankcustomer values('Nikhil', 'Akbar_road', 'Delhi');
insert into bankcustomer values('Ravi', 'Prithviraj_road', 'Delhi');
select * from bankcustomer;
```

Result Grid | Filter Rows: | Edit:

customername	customerstreet	customercity
Avinash	Bulltemple_road	Bangalore
Dinesh	Bannerghatta_road	Bangalore
Mohan	National_college	Bangalore
Nikhil	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('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);
insert into depositer values('Nikhil',12);
select * from depositer;
```

Result Grid | Filter Rows:

customername	accno
Avinash	1
Dinesh	2
Nikhil	4
Ravi	5
Avinash	8
Nikhil	9
Dinesh	10
Nikhil	11
Nikhil	12
NULL	NULL

```
insert into loan values(1, 'SBI_Chamrajpete',1000);
insert into loan values(2, 'SBI_Residency_road', 2000);
insert into loan values(3, 'SBI_Shivaji_road', 3000);
```

```
insert into loan values(4, 'SBI_Parliament_road', 4000);
insert into loan values(5, 'SBI_Jantarmantar', 5000);
select * from loan;
```

Result Grid | Filter Rows: | Edit:

loannumber	branchname	amount
1	SBI_Chamrajpete	1000
2	SBI_Residency_road	2000
3	SBI_Shivaji_road	3000
4	SBI_Parliament_road	4000
5	SBI_Jantarmantar	5000
NULL	NULL	NULL

```
insert into  Borrower values('Avinash',1);
insert into Borrower values('Dinesh',2);
insert into Borrower values('Mohan',3);
insert into Borrower values('Nikhil',4);
insert into Borrower values('Ravi',5);
Select * from Borrower;
```

Result Grid | Filter Rows:

customername	loannumber
Avinash	1
Dinesh	2
Mohan	3
Nikhil	4
Ravi	5
NULL	NULL

Queries

● Display the branch name and assets from all branches and rename the assets column to 'assets in lakhs'.

```
alter table Branch rename column assets to assets_in_lks;
select branchname, assets_in_lks from Branch;
```

Result Grid | Filter Rows:

branchname	assets_in_lks
SBI_Chamrajpete	50000
SBI_Jantarmantar	20000
SBI_Mantrimarg	150000
SBI_Parliament_road	10000
SBI_Residency_road	10000
SBI_Shivaji_road	20000
NULL	NULL

● 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.branchname='**ResideRoad**' **and** d.accno=b.accno **group by** d.customername **having count**(d.accno)>=2;

Result Grid | Filter Rows:

customername

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

create view br as select branchname, **sum**(amount) from loan

group by branchname;

select * from br;

Result Grid | Filter Rows:

branchname	sum(amount)
SBI_Chamrajpete	1000
SBI_Jantarmantar	5000
SBI_Parliament_road	4000
SBI_Residency_road	2000
SBI_Shivaji_road	3000

More Queries on Bank Database

Question

(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

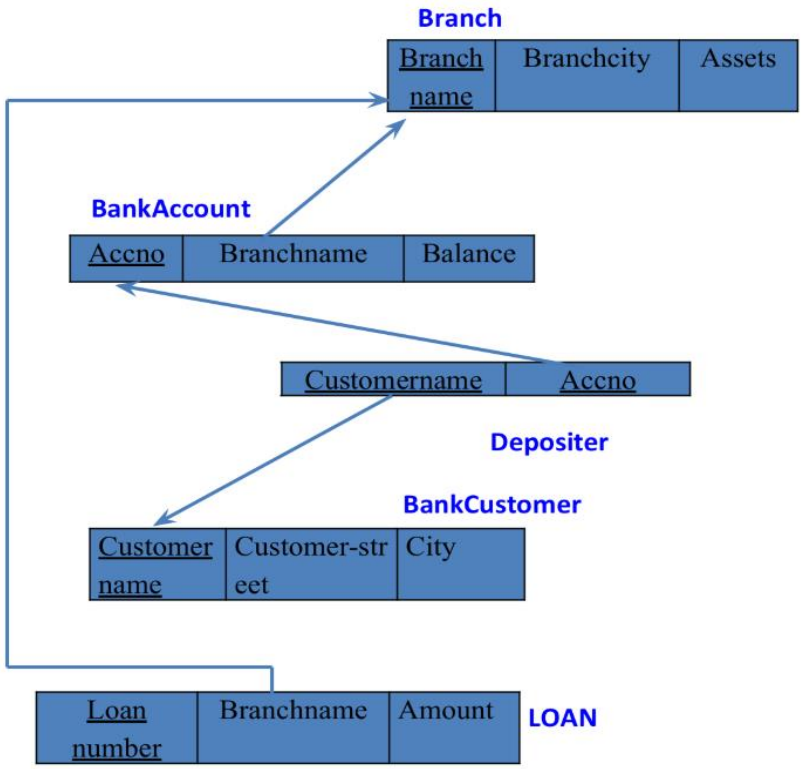
- located in a specific city (Ex. Delhi).

- 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).

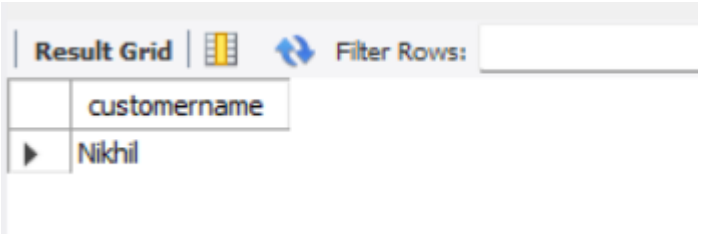
- Update the Balance of all accounts by 5%



Queries

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

select d.customername **from** depositer d, Branch b, Bankaccount a
where b.branchname = a.branchname and a.accno=d.accno and city = 'Delhi'
group by d.customername having **count(**distinct b.branchname)=(select count(branchname) from Branch
where city = 'Delhi');



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

select distinct d.customername from depositer d, Bankaccount ba, Branch b where d.accno = ba.accno And ba.branchname=b.branchname and b.city='Delhi' group by d.customername **having count**(distinct b.branchname)>1;

Result Grid | Filter Rows:

customername
Nikhil

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

select b.customername from Borrower b **where** b.loannumber in(select d.accno **from** depositer d, Bankaccount ba, Branch b **where** b.loannumber = d.accno and d.accno = ba.accno and ba.branchname=b.branchname and b.city='Bangalore');

Result Grid | Filter Rows:

customername
Avinash
Dinesh

Employee Database

Question

(Week 05)

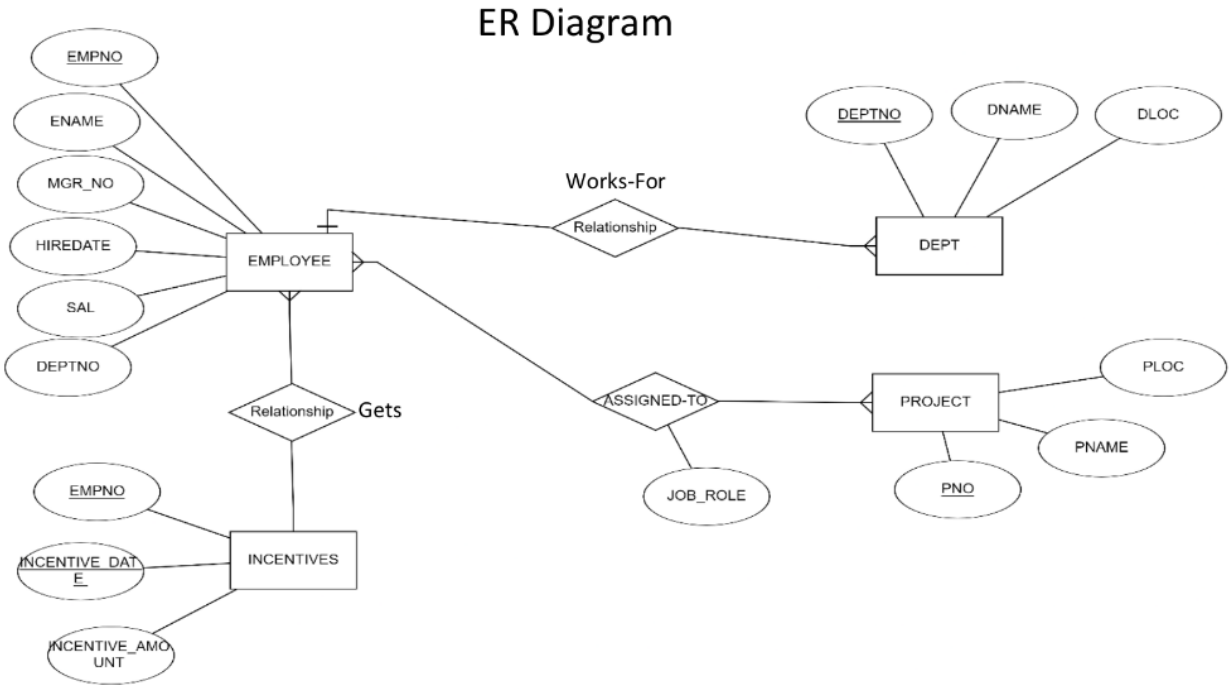
1. Using Scheme diagram, Create tables by properly specifying the primary keys and the foreign keys.

2. Enter greater than five tuples for each table.

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

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

5. 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.



Create database

```
create database employee_402;
use employee_402;
```

Create tables

```
create table dept (
deptno int primary key,
dname varchar(50),
dloc varchar(50)
);

create table employee (
empno int primary key,
ename varchar(50),
mgr_no int,
hiredate date,
sal int,
deptno int,
foreign key (deptno) references dept(deptno)
);

create table project (
pno int primary key,
ploc varchar(50),
pname varchar(50)
);

create table assigned_to (
empno int,
pno int,
job_role varchar(50),
primary key (empno, pno),
foreign key (empno) references employee(empno),
foreign key (pno) references project(pno)
);

create table incentives (
empno int,
incentive_date date,
incentive_amount int,
foreign key (empno) references employee(empno));
```

Department table :

Result Grid | Filter Rows: | Export: | Wr

Field	Type	Null	Key	Default	Extra
deptno	int	NO	PRI	NULL	
dname	varchar(50)	YES		NULL	
dloc	varchar(50)	YES		NULL	

Employee Table :

Result Grid | Filter Rows: | Export: | W

Field	Type	Null	Key	Default	Extra
empno	int	NO	PRI	NULL	
ename	varchar(50)	YES		NULL	
mgr_no	int	YES		NULL	
hiredate	date	YES		NULL	
sal	int	YES		NULL	
deptno	int	YES	MUL	NULL	

Project table :

Result Grid | Filter Rows: | Export:

Field	Type	Null	Key	Default	Extra
pno	int	NO	PRI	NULL	
ploc	varchar(50)	YES		NULL	
pname	varchar(50)	YES		NULL	

Assigned_to table :

Result Grid | Filter Rows: | Export: | Wrap

Field	Type	Null	Key	Default	Extra
empno	int	NO	PRI	NULL	
pno	int	NO	PRI	NULL	
job_role	varchar(50)	YES		NULL	

Incentive table:

Result Grid | Filter Rows: | Export: | Wrap

Field	Type	Null	Key	Default	Extra
empno	int	YES	MUL	NULL	
incentive_date	date	YES		NULL	
incentive_amount	int	YES		NULL	

Inserting the values to the tables

```
insert into dept values(10,'sales','bengaluru');
insert into dept values(20,'marketing','hyderbad');
insert into dept values(30,'finance','mysuru');
insert into dept values(40,'HR','bengaluru');
insert into dept values(50,'IT','hyderbad');
select * from dept;
```

Result Grid | Filter Rows: | Edit:

depno	dname	dloc
10	sales	bengaluru
20	marketing	hyderbad
30	finance	mysuru
40	HR	bengaluru
50	IT	hyderbad
NULL	NULL	NULL

```
insert into employee values(1,'alice',2,'2022-01-01',55000,10);
insert into employee values(2,'bob',3,'2023-04-05',68000,20);
insert into employee values(3,'charlie',1,'2025-06-11',23000,10);
insert into employee values(4,'david',2,'2022-03-01',55800,20);
```

```
insert into employee values(5,'emily',null,'2022-04-11',67800,10);
select * from employee;
```

Result Grid | Filter Rows: | Edit:

empno	ename	mgrno	hiredate	sal	depno
1	alice	2	2022-01-01	55000	10
2	bob	3	2023-04-05	68000	20
3	charlie	1	2025-06-11	23000	10
4	david	2	2022-03-01	55800	20
5	emily	NULL	2022-04-11	67800	10
NULL	NULL	NULL	NULL	NULL	NULL

```
insert into project values(1,'e-learning','bengaluru');
insert into project values(2,'hostel management','hyderbad');
insert into project values(3,'hotel management','bengaluru');
insert into project values(4,'face recognition','chennai');
insert into project values(5,'face emotion recognition','mysuru');
select * from project;
```

Result Grid | Filter Rows: | Edit:

empno	ename	mgrno	hiredate	sal	depno
1	alice	2	2022-01-01	55000	10
2	bob	3	2023-04-05	68000	20
3	charlie	1	2025-06-11	23000	10
4	david	2	2022-03-01	55800	20
5	emily	NULL	2022-04-11	67800	10
NULL	NULL	NULL	NULL	NULL	NULL

```
insert into assignment values(1,1,'manager');
insert into assignment values(2,2,'team lead');
insert into assignment values(3,1,'analyst');
insert into assignment values(4,2,'developer');
insert into assignment values(5,3,'tester');
select * from assignment;
```

Result Grid | Filter Rows: | Edit:

empno	pno	jobrole
1	1	manager
2	2	team lead
3	1	analyst
4	2	developer
5	3	tester
NULL	NULL	NULL

insert into incentives values(1,'2022-11-10',5000);
insert into incentives values(2,'2023-12-10',5000);
insert into incentives values(3,'2024-12-10',5000);
insert into incentives values(4,'2022-10-10',5000);
select * from incentives;

Result Grid | Filter Rows: | Edit:

empno	incentive_date	incentive_amount
1	2022-11-10	5000
2	2023-12-10	5000
3	2024-12-10	5000
4	2022-10-10	5000
NULL	NULL	NULL

Queries

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

select empno **from** assignment **where** pno in(select pno **from** project **where** ploc in('bengaluru','mysuru'));

Result Grid | Filter Rows: | Export:

empno
1
3
5

4 Get Employee ID's of those employees who didn't receive incentives

select empno **from** employee **where** empno not in(select empno from incentives);

Result Grid | Filter Rows: | Edit:

empno
5
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.ename,e.empno, d.dname, a.jobrole, d.dloc as deploc, p.ploc as proloc **from** employee e **join** dept d on e.depno = d.depno join assignment a **on** e.empno = a.empno **join** project p on a.pno=p.pno **where** d.dloc = p.ploc;

Result Grid | Filter Rows: | Export: | Wrap C

ename	empno	dname	jobrole	deploc	proloc
alice	1	sales	manager	bengaluru	bengaluru
bob	2	marketing	team lead	hyderbad	hyderbad
charlie	3	sales	analyst	bengaluru	bengaluru
david	4	marketing	developer	hyderbad	bengaluru
emily	5	sales	tester	bengaluru	bengaluru

More Queries on Employee Database

Question

(Week 06)

1. Using Scheme diagram, Create tables by properly specifying the primary keys and the foreign keys.

2. Enter greater than five tuples for each table.

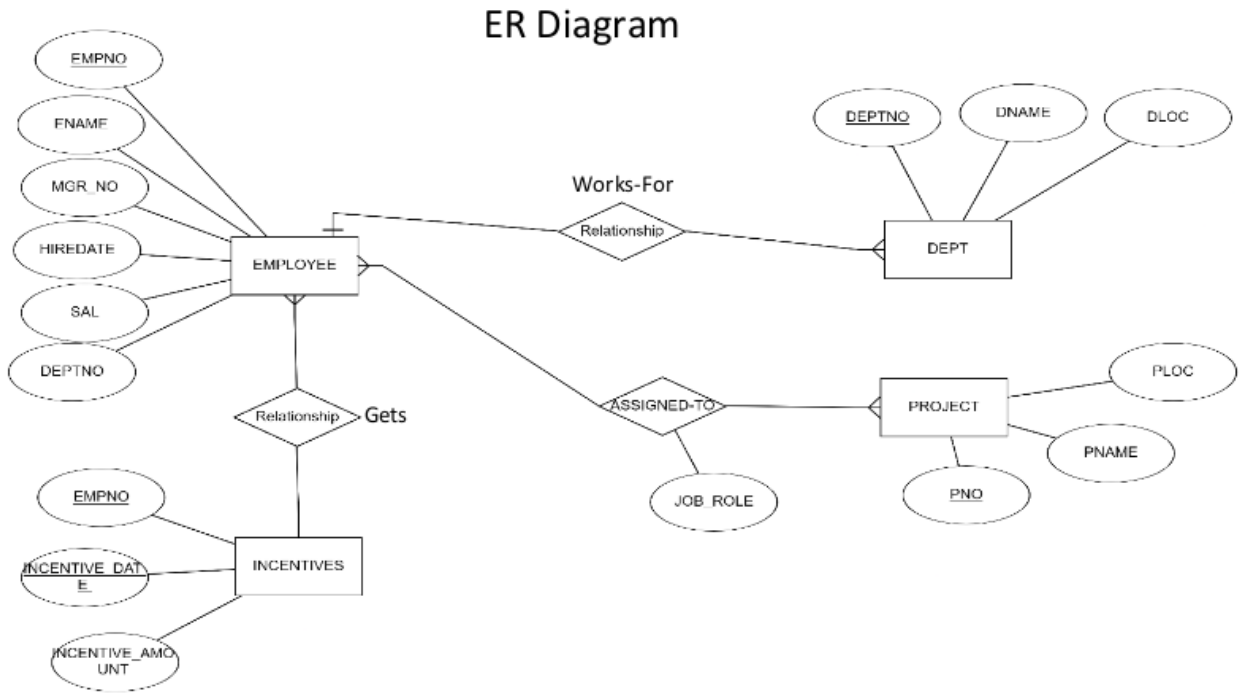
3. List the name of the managers with the maximum employees

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

5. Find the name of the second top level managers of each department.

6. Find the employee details who got second maximum incentive in January 2019.

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



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

select mgrno as manager_id, **count(**empno) as employeecount **from** employee **group by** mgrno **order by** employeecount **desc** limit 1;

Result Grid | Filter Rows:

manager_id	employeecount
2	2

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

select m.ename as managername,m.sal **as** managersalary,emp_avg.avg_employee_salary **from** employee m **join** (select mgrno,avg(sal)as avg_employee_salary from employee **group by** mgrno) as emp_avg **on** m.empno=emp_avg.mgrno;

Result Grid | Filter Rows: | Export:

managername	managersalary	avg_employee_salary
alice	55000	23000.0000
bob	68000	55400.0000
charlie	23000	68000.0000

5. Find the name of the second top level managers of each department.

select ename as secondtopmanager **from**(select m.empno,d.depno,row_number() over(partition by d.depno **order by** m.sal desc) as rank1 **from** employee m **join** dept d on m.depno=d.depno **where** m.mgrno is null) as rankedmanagers **where** rank1=2;

● Find the employee details who got second maximum incentive in January 2019

select e.empno,e.ename,e.sal, e.depno from employee e join incentives i on e.empno=i.empno where i.incentive_date between '2022-11-10' and '2024-12-10' order by i.incentive_amount desc limit 1 offset 1;

Result Grid | Filter Rows: | Export:

empno	ename	sal	depno
2	bob	68000	20

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

select e.ename as employeename **from** employee e **join** employee m **on** e.mgrno=m.mgrno **where** e.depno=m.depno;

Result Grid | Filter Rows: | Export:

employeename
alice
bob
charlie
david

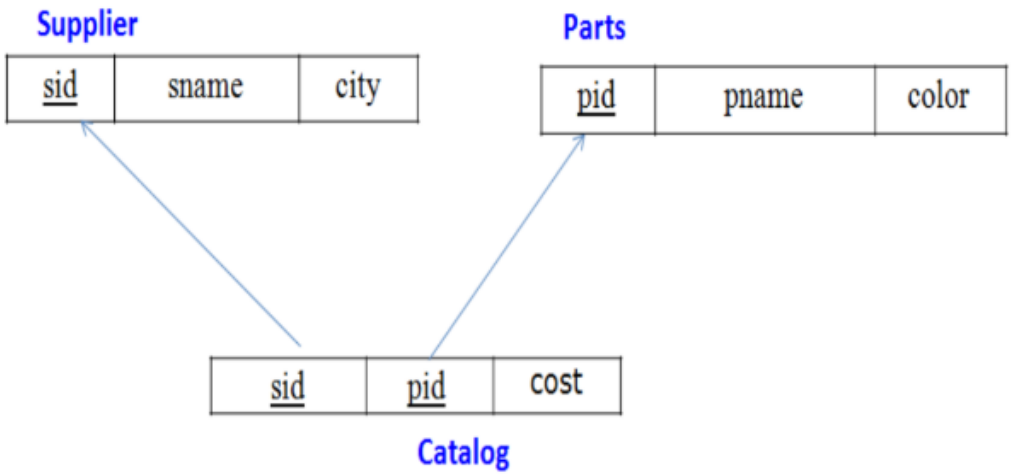
Supplier Database

Question

(Week 07)

1. Using Scheme diagram, Create tables by properly specifying the primary keys and the foreign keys.
2. Insert appropriate records in each table.
3. Find the pnames of parts for which there is some supplier.
4. Find the snames of suppliers who supply every part.
5. Find the snames of suppliers who supply every red part.
6. Find the pnames of parts supplied by Acme Widget Suppliers and by no one else.
7. 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).
8. For each part, find the sname of the supplier who charges the most for that part.

Schema Diagram



Create Database

```
Create database supplier_402;
Use supplier_402;
```

Create tables

```
create table supplier(
sid int primary key,
sname varchar(20),
city varchar(30)
);
desc supplier;

create table parts(
pid int primary key,
pname varchar(20),
color varchar(20)
);

desc parts;
create table catalog(
```

sid int, pid int,
cost int,
foreign key(sid) **references** supplier(sid),
foreign key(pid) **references** parts(pid)
);
desc catalog;

Supplier Table

Result Grid | Filter Rows: | Export:

Field	Type	Null	Key	Default	Extra
sid	int	NO	PRI	NULL	
sname	varchar(20)	YES		NULL	
city	varchar(30)	YES		NULL	

Parts Table

Result Grid | Filter Rows: | Export:

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

Catalog table

Result Grid | Filter Rows: | Export:

Field	Type	Null	Key	Default	Extra
sid	int	YES	MUL	NULL	
pid	int	YES	MUL	NULL	
cost	int	YES		NULL	

Inserting the values

insert into supplier values
(10001, "acne", "Bangalore"),
(10002, "johns", "Kolkata"),
(10003, "vimal", "Mumbai"),
(10004, "reliance", "Delhi");
select * from supplier;

Supplier Table

Result Grid Filter Rows:

sid	sname	city
10001	acne	Bangalore
10002	johns	Kolkata
10003	vimal	Mumbai
10004	reliance	Delhi
NULL	NULL	NULL

(20001,"Book","Red"),
(20002,"Pen","Red"),
(20003,"Pencil","Green"),
(20004,"Mobile","Green"),
(20005,"Charger","Black");
select * from parts;

Parts Table

Result Grid Filter Rows:

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

(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);
select * from catalog;

Catalog Table

Result Grid | Filter Rows:

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

Queries

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

select pname **from** parts **where** pid **in** (**select** pid **from** catalog);

Result Grid | Filter Rows:

pname
Book
Pen
Pencil
Mobile
Charger

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

select sname **from** supplier **where sid in**

(**select sid from** catalog **group by sid having count**(**distinct** pid) = (**select count**(**distinct** pid) **from** parts));

Result Grid | Filter Rows:

sname
acne

42

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

select distinct sname **from** supplier, parts, catalog
where supplier.sid = catalog.sid **and** parts.pid = catalog.pid **and** parts.color="Red";

Result Grid | Filter Rows:

sname
acne
johns

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

select pname **from** parts **where** pid **not in**
(**select** pid **from** catalog **where sid in** (**select sid from** supplier **where** sname != "acne"));

Result Grid | Filter Rows:

pname
Mobile
Charger

● **Find the sids of suppliers who charge more for some part than the average cost of that part (averaged over all the suppliers who supply that part).**

select sid from catalog a **where** a.cost > (**select avg**(b.cost) **from** catalog b **where** a.pid = b.pid **group by** b.pid);

Result Grid | Filter Rows:

sid
10002
10004

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

select pid, sname **from** catalog a, supplier **where** a.cost = (select max(b.cost) **from** catalog b **where** a.pid = b.pid group by b.pid) and supplier.sid = a.sid;

Result Grid Filter Rows:

pid	sname
20001	acne
20004	acne
20005	acne
20001	johns
20002	johns
20003	reliance

NoSQL (Student Database)

Question

(Week 08)

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 a query to update the 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 dataset from local file system into

mongodb collection.

Create database

db.createCollection("Student")*;*

Show dbs;

```
Atlas atlas-ilms3w-shard-0 [primary] test> db.createCollection("Student");
{ ok: 1 }
Atlas atlas-ilms3w-shard-0 [primary] test> show dbs;
sample_mflix  121.20 MiB
test           72.00 KiB
admin         328.00 KiB
local           4.90 GiB
Atlas atlas-ilms3w-shard-0 [primary] test> show dbs;
sample_mflix  121.20 MiB
test           72.00 KiB
admin         328.00 KiB
local           4.90 GiB
Atlas atlas-ilms3w-shard-0 [primary] test> |
```

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"});

```
Atlas atlas-ilms3w-shard-0 [primary] test> db.Student.insert({RollNo:1,Age:21,Cont:9876,email:"antara.de9@gmail.com"});
DeprecationWarning: Collection.insert() is deprecated. Use insertOne, insertMany, or bulkWrite.
{
  acknowledged: true,
  insertedIds: { '0': ObjectId("674bfdd272c929d70ce00e40") }
}
Atlas atlas-ilms3w-shard-0 [primary] test>

Atlas atlas-ilms3w-shard-0 [primary] test> db.Student.insert({RollNo:2,Age:22,Cont:9976,email:"anushka.de9@gmail.com"});

{
  acknowledged: true,
  insertedIds: { '0': ObjectId("674bfdd272c929d70ce00e41") }
}
Atlas atlas-ilms3w-shard-0 [primary] test>

Atlas atlas-ilms3w-shard-0 [primary] test> db.Student.insert({RollNo:3,Age:21,Cont:5576,email:"anubhav.de9@gmail.com"});

{
  acknowledged: true,
  insertedIds: { '0': ObjectId("674bfdd272c929d70ce00e42") }
}
Atlas atlas-ilms3w-shard-0 [primary] test>

Atlas atlas-ilms3w-shard-0 [primary] test> db.Student.insert({RollNo:4,Age:20,Cont:4476,email:"pani.de9@gmail.com"});
{
  acknowledged: true,
  insertedIds: { '0': ObjectId("674bfdd372c929d70ce00e43") }
}
Atlas atlas-ilms3w-shard-0 [primary] test>

Atlas atlas-ilms3w-shard-0 [primary] test> db.Student.insert({RollNo:10,Age:23,Cont:2276,email:"rekha.de9@gmail.com"});
{
  acknowledged: true,
Atlas atlas-ilms3w-shard-0 [primary] test>
```

Structure of the table

db.Student.**find()**;

```
    _id: ObjectId("674bfdd272c929d70ce00e40"),
    RollNo: 1,
    Age: 21,
    Cont: 9876,
    email: 'antara.de9@gmail.com'
  },
  {
    _id: ObjectId("674bfdd272c929d70ce00e41"),
    RollNo: 2,
    Age: 22,
    Cont: 9976,
    email: 'anushka.de9@gmail.com'
  },
  {
    _id: ObjectId("674bfdd272c929d70ce00e42"),
    RollNo: 3,
    Age: 21,
    Cont: 5576,
    email: 'anubhav.de9@gmail.com'
  },
  {
    _id: ObjectId("674bfdd372c929d70ce00e43"),
    RollNo: 4,
    Age: 20,
    Cont: 4476,
    email: 'pani.de9@gmail.com'
  },
  {
    _id: ObjectId("674bfdd372c929d70ce00e44"),
    RollNo: 10,
    Age: 23,
    Cont: 2276,
    email: 'rekha.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"}});

```
]
Atlas atlas-ilms3w-shard-0 [primary] test> db.Student.update({RollNo:10},{$set:
... {email:"Abhinav@gmail.com"}});
DeprecationWarning: Collection.update() is deprecated. Use updateOne, updateMany, or bulkWrite.
{
  acknowledged: true,
  insertedId: null,
  matchedCount: 1,
  modifiedCount: 0,
  upsertedCount: 0
}
Atlas atlas-ilms3w-shard-0 [primary] test> |
```

- **Replace the student name from “ABC” to “FEM” of rollno 11.**

db.Student.update({RollNo:11,Name:"ABC"},{$set:{Name:"FEM"}})

```
Atlas atlas-ilms3w-shard-0 [primary] test> db.Student.insert({RollNo:11,Age:22,Name:"ABC",Cont:2276,email:"rea.de9@gmail
.com"});
{
  acknowledged: true,
  insertedIds: { '0': ObjectId("674c001b72c929d70ce00e45") }
}
Atlas atlas-ilms3w-shard-0 [primary] test> db.Student.update({RollNo:11,Name:"ABC"},{$set:{Name:"FEM"}});
{
  acknowledged: true,
  insertedId: null,
  matchedCount: 1,
  modifiedCount: 1,
  upsertedCount: 0
}
```

NoSQL (Customer Database)

Question

(week-09)

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 ‘Z’ 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 the local file system into mongodb collection.

Create Table:

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

```
Atlas atlas-ilms3w-shard-0 [primary] test> db.createCollection("Customer");
{ ok: 1 }
```

Inserting values into the table.

```
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"}]);
```

```
Atlas atlas-ilms3w-shard-0 [secondary] test> 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, a
cc_bal: 10000, acc_type: "Saving" }, { custid: 5, acc_bal: 2000, acc_type: "Checking" }]);
{
  acknowledged: true,
  insertedIds: {
    '0': ObjectId("674c02572ea31342ceed82a1"),
    '1': ObjectId("674c02572ea31342ceed82a2"),
    '2': ObjectId("674c02572ea31342ceed82a3"),
    '3': ObjectId("674c02572ea31342ceed82a4"),
    '4': ObjectId("674c02572ea31342ceed82a5")
  }
}
Atlas atlas-ilms3w-shard-0 [primary] test>
```

Queries

Finding all checking accounts with balance greater than 12000

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

```
}
Atlas atlas-ilms3w-shard-0 [primary] test> db.Customer.find({acc_bal: {$gt: 12000}, acc_type:"Checking"});
[
  {
    _id: ObjectId("674c02572ea31342ceed82a2"),
    custid: 1,
    acc_bal: 20000,
    acc_type: 'Checking'
  },
  {
    _id: ObjectId("674c02572ea31342ceed82a3"),
    custid: 3,
    acc_bal: 50000,
    acc_type: 'Checking'
  }
]
Atlas atlas-ilms3w-shard-0 [primary] test>
```

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-ilms3w-shard-0 [primary] test> db.Customer.aggregate([{$group:{_id:"$custid", minBal:{$min:"$acc_bal"}, maxB
al:{$max:"$acc_bal"}}}]);
[
  { _id: 4, minBal: 10000, maxBal: 10000 },
  { _id: 5, minBal: 2000, maxBal: 2000 },
  { _id: 1, minBal: 10000, maxBal: 20000 },
  { _id: 3, minBal: 50000, maxBal: 50000 }
]
Atlas atlas-ilms3w-shard-0 [primary] test>
```

Dropping collection “Customer”

db.Customer.drop();

```
]
Atlas atlas-ilms3w-shard-0 [primary] test> db.Customer.drop();
true
Atlas atlas-ilms3w-shard-0 [primary] test>
```

Exporting the collection to a json file

mongodb+srv://architavcs23:<db_password>@cluster0.memuu.mongodb.net/--collection=Customer-- out C:\Users\vijay\Documents\test.Customer.json

Exporting from a json file to the collection

mongodb+srv://architavcs23:<db_password>@cluster0.memuu.mongodb.net/--collection=Customer-- out C:\Users\vijay\Documents\test.Customer.json

db.Customer.find();

```
  }
}
Atlas atlas-ilms3w-shard-0 [primary] test> db.Customer.find();
[
  {
    _id: ObjectId("674c072d0403c1dd8cd28636"),
    custid: 1,
    acc_bal: 10000,
    acc_type: 'Saving'
  },
  {
    _id: ObjectId("674c072d0403c1dd8cd28637"),
    custid: 1,
    acc_bal: 20000,
    acc_type: 'Checking'
  },
  {
    _id: ObjectId("674c072d0403c1dd8cd28638"),
    custid: 3,
    acc_bal: 50000,
    acc_type: 'Checking'
  },
  {
    _id: ObjectId("674c072d0403c1dd8cd28639"),
    custid: 4,
    acc_bal: 10000,
    acc_type: 'Saving'
  },
  {
    _id: ObjectId("674c072d0403c1dd8cd2863a"),
    custid: 5,
    acc_bal: 2000,
    acc_type: 'Checking'
  }
]
```

No SQL (Restaurant Database)

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 order 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 zip code that starts with '10'.

Create Table

db.**createCollection**("Restaurant");

```
]
Atlas atlas-ilms3w-shard-0 [primary] test> db.createCollection("Restaurant");
{ ok: 1 }
Atlas atlas-ilms3w-shard-0 [primary] test>
```

Inserting values into table

db.restaurants.insertMany([{ name: "Meghna Foods", town: "Jayanagar", cuisine: "Indian", score: 8, address: { zipcode: "10001", street: "Jayanagar“ } });

```
Atlas atlas-ilms3w-shard-0 [primary] test> db.restaurants.insertMany([ { name: "Meghna Foods", town: "Jayanagar", cuisin
e: "Indian", score: 8, address: { zipcode: "10001", street: "Jayanagar"}}]);
{
  acknowledged: true,
  insertedIds: { '0': ObjectId("674c09b82b67942608d84e57") }
}
Atlas atlas-ilms3w-shard-0 [primary] test>
```

db.restaurants.insertMany([{ name: "Empire", town: "MG Road", cuisine: "Indian", score: 7, address: { zipcode: "10100", street: "MG Road" } }]);

```
Atlas atlas-ilms3w-shard-0 [primary] test> db.restaurants.insertMany([{name:"Empire", town: "MG Road", cuisine: "Indian"
, score: 7, address: { zipcode: "10100", street: "MG Road" }}]);
{
  acknowledged: true,
  insertedIds: { '0': ObjectId("674c0a432b67942608d84e58") }
}
Atlas atlas-ilms3w-shard-0 [primary] test>
```

db.restaurants.insertMany([{ name: "Chinese WOK", town: "Indiranagar", cuisine: "Chinese", score: 12, address: { zipcode: "20000", street: "Indiranagar" } }]);

```
}
Atlas atlas-ilms3w-shard-0 [primary] test>  db.restaurants.insertMany([{ name: "Chinese WOK", town: "Indiranagar", cuisi
ne: "Chinese", score: 12, address: { zipcode: "20000", street: "Indiranagar" } }]);
{
  acknowledged: true,
  insertedIds: { '0': ObjectId("674c0ac02b67942608d84e59") }
}
Atlas atlas-ilms3w-shard-0 [primary] test>
```

db..restaurants.insertMany([{ name: "Kyotos", town: "Majestic", cuisine: "Japanese", score: 9, address: { zipcode: "10300", street: "Majestic" } }]);

```
}
Atlas atlas-ilms3w-shard-0 [primary] test>  db.restaurants.insertMany([{ name: "Kyotos", town: "Majestic", cuisine: "Jap
anese", score: 9, address: { zipcode: "10300", street: "Majestic" } }]);
{
  acknowledged: true,
  insertedIds: { '0': ObjectId("674c0af92b67942608d84e5a") }
}
Atlas atlas-ilms3w-shard-0 [primary] test>
```

db.restaurants.insertMany([{ name: "WOW Momos", town: "Malleshwaram", cuisine: "Indian", score: 5, address: { zipcode: "10400", street: "Malleshwaram" }}]);

```
Atlas atlas-ilms3w-shard-0 [primary] test> db.restaurants.insertMany([{ name: "WOW Momos", town: "Malleshwaram", cuisine
: "Indian", score: 5, address: { zipcode: "10400", street: "Malleshwaram" }} ]);
{
  acknowledged: true,
  insertedIds: { '0': ObjectId("674c0b392b67942608d84e5b") }
}
Atlas atlas-ilms3w-shard-0 [primary] test>
```

Queries

db.restaurants.find({});

```
    cuisine: 'Indian',
    score: 7,
    address: { zipcode: '10100', street: 'MG Road' }
  },
  {
    _id: ObjectId("674c0ac02b67942608d84e59"),
    name: 'Chinese WOK',
    town: 'Indiranagar',
    cuisine: 'Chinese',
    score: 12,
    address: { zipcode: '20000', street: 'Indiranagar' }
  },
  {
    _id: ObjectId("674c0af92b67942608d84e5a"),
    name: 'Kyotos',
    town: 'Majestic',
    cuisine: 'Japanese',
    score: 9,
    address: { zipcode: '10300', street: 'Majestic' }
  },
  {
    _id: ObjectId("674c0b392b67942608d84e5b"),
    name: 'WOW Momos',
    town: 'Malleshwaram',
    cuisine: 'Indian',
    score: 5,
    address: { zipcode: '10400', street: 'Malleshwaram' }
  }
]
Atlas atlas-ilms3w-shard-0 [primary] test> |
```

Query to arrange the name of the restaurants in descending along with all the columns.

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

```
]
Atlas atlas-ilms3w-shard-0 [primary] test> db.restaurants.find({}).sort({ name: -1 });
[
  {
    _id: ObjectId("674c0b392b67942608d84e5b"),
    name: 'WOW Momos',
    town: 'Malleshwaram',
    cuisine: 'Indian',
    score: 5,
    address: { zipcode: '10400', street: 'Malleshwaram' }
  },
  {
    _id: ObjectId("674c08fa0403c1dd8cd2863b"),
    name: 'Meghna Foods',
    town: 'Jayanagar',
    cuisine: 'Indian',
    score: 8,
    address: { zipcode: '10001', street: 'Jayanagar' }
  },
  {
    _id: ObjectId("674c09b82b67942608d84e57"),
    name: 'Meghna Foods',
    town: 'Jayanagar',
    cuisine: 'Indian',
    score: 8,
    address: { zipcode: '10001', street: 'Jayanagar' }
  },
  {
    _id: ObjectId("674c0af92b67942608d84e5a"),
    name: 'Kyotos',
    town: 'Majestic',
    cuisine: 'Japanese',
    score: 9,
    address: { zipcode: '10300', street: 'Majestic' }
```

```
    cuisine: 'Indian',
    score: 8,
    address: { zipcode: '10001', street: 'Jayanagar' }
  },
  {
    _id: ObjectId("674c0af92b67942608d84e5a"),
    name: 'Kyotos',
    town: 'Majestic',
    cuisine: 'Japanese',
    score: 9,
    address: { zipcode: '10300', street: 'Majestic' }
  },
  {
    _id: ObjectId("674c0a432b67942608d84e58"),
    name: 'Empire',
    town: 'MG Road',
    cuisine: 'Indian',
    score: 7,
    address: { zipcode: '10100', street: 'MG Road' }
  },
  {
    _id: ObjectId("674c0ac02b67942608d84e59"),
    name: 'Chinese WOK',
    town: 'Indiranagar',
    cuisine: 'Chinese',
    score: 12,
    address: { zipcode: '20000', street: 'Indiranagar' }
  }
]
Atlas atlas-ilms3w-shard-0 [primary] test> |
```

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 });

```
]
Atlas atlas-ilms3w-shard-0 [primary] test> db.restaurants.find({ "score": { $lte: 10 } }, { _id: 1, name: 1, town: 1, cu
cuisine: 1 });
[
  {
    _id: ObjectId("674c08fa0403c1dd8cd2863b"),
    name: 'Meghna Foods',
    town: 'Jayanagar',
    cuisine: 'Indian'
  },
  {
    _id: ObjectId("674c09b82b67942608d84e57"),
    name: 'Meghna Foods',
    town: 'Jayanagar',
    cuisine: 'Indian'
  },
  {
    _id: ObjectId("674c0a432b67942608d84e58"),
    name: 'Empire',
    town: 'MG Road',
    cuisine: 'Indian'
  },
  {
    _id: ObjectId("674c0af92b67942608d84e5a"),
    name: 'Kyotos',
    town: 'Majestic',
    cuisine: 'Japanese'
  },
  {
    _id: ObjectId("674c0b392b67942608d84e5b"),
    name: 'WOW Momos',
    town: 'Malleshwaram',
    cuisine: 'Indian'
  }
]
```

Query to find the average score for each restaurant

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

```
]
Atlas atlas-ilms3w-shard-0 [primary] test> db.restaurants.aggregate([ { $group: { _id: "$name", average_score: { $avg: "
$score" } } } ]) ;
[
  { _id: 'Meghna Foods', average_score: 8 },
  { _id: 'Empire', average_score: 7 },
  { _id: 'WOW Momos', average_score: 5 },
  { _id: 'Kyotos', average_score: 9 },
  { _id: 'Chinese WOK', average_score: 12 }
]
```