VISVESVARAYATECHNOLOGICALUNIVERSITY

“JnanaSangama”, Belgaum -590014, Karnataka.

LAB REPORT
on

Database Management Systems (23CS3PCDBM)

Submitted by

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(1BM23CS069)

in partial fulfillment for the award of the degree of
BACHELOROFENGINEERING
in
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B.M.S. COLLEGE OF ENGINEERING
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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 BISWAJEET BEHERA **(1BM23CS069),** 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.

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Insurance Database

Question (Week 1)

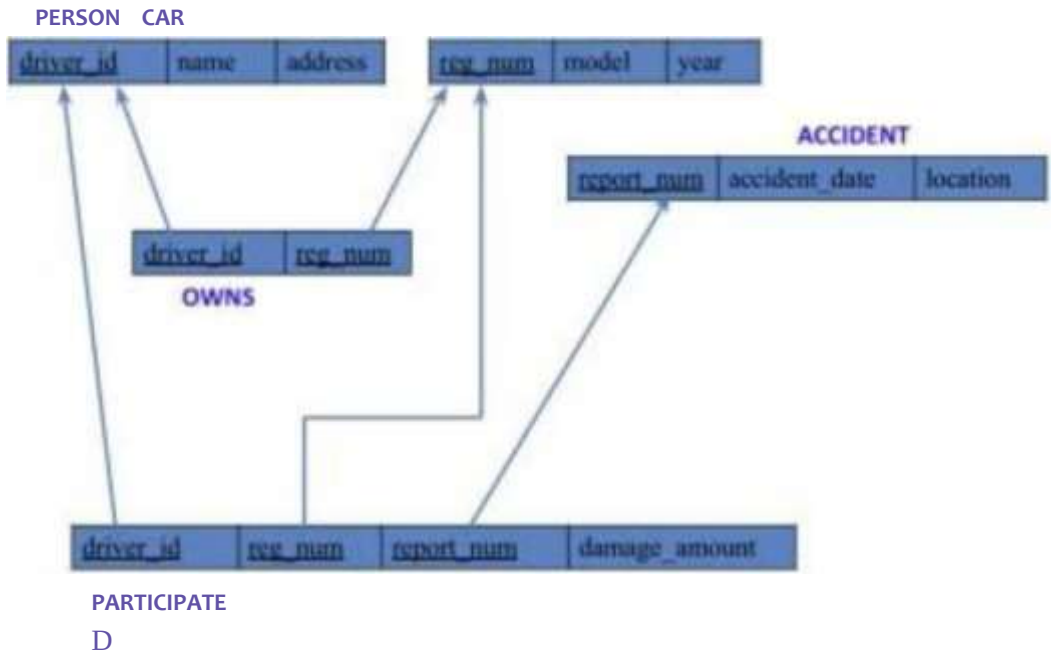
- PERSON (driver_id: String, name: String, address: String)
- CAR (reg_num: String, model: String, year: int)
- ACCIDENT (report_num: int, accident_date: date, location: String)
- OWNS (driver_id: String, reg_num: String)
- PARTICIPATED (driver_id: String,reg_num: String, report_num: int, damage_amount: 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 'K A053408') 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



D

Create Database

create database insurance_Ayush058;

use insurance_Ayush058;

Create Table

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
r	driverjd	varchar(lO)	NO	PRI	iiim«
	name	varchar(20)	YES		ilium
	address	varchar(30)	YES		rum

desc car;

	Field	Type	Null	Key	Default Extra
▶	reg_num	varchar(lO)	NO	PRI	rwn
	model	varchar(lO)	YES		mini
	year	int	YES		mini

desc accident;

	Field	Type	Null	Key	Default Extra
▶	report_num	int	NO	PRI	nns
	actident_date	date	YES		irimi
	location	varchar(20)	YES		can

desc owns;

Field	Type	Null	Key	Default	Extra
driver Jd	varchar(lO)	NO	PRI		
reg_num	vardiar(lO)	NO	PRI		

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	

Inserting Values to the table

insert into person values('A01','Richard','Srinivar Nagar');
insert into person values('A02','Pradeep','Rajaji Nagar');
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;

	driverjd	name	address
▶	A01	Richard	Srinivar Nagar
	AO 2	Pradeep	Rajaji Nagar
	AO 3	Smith	Ashok Nagar
	A04	Venu	N.R Colony
	AO 5 IWill	John muii	Hanumanth Nagar i;iun
*			

```
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','Honola',2008);
insert into car values('KA041702','Audi',2005); select
 *from car;
```

	reg_num	model	year
►	KA031181	Lancer	1957
	KA041702	Audi	2005
	KAO52250	Indica	1990
	KAO53408	Honola	2008
	KA095477	Toyota	1998
	lauii	mmi	iiim«

```
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,'2004-03-05','Kanakpura Road');
select * from accident;
```

	report_num	actident_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	2004-03-05	Kanakpura Road
	16	2008-03-08	Dolmor
	ram	lil'Hl	u

```
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'); drop
table owns; select * from owns;
```

	driverjd	reg_num
▶	AO 2	KA031181
	AO 5	KA041702
	A01	KAO52250
	A04	KAO53408
	AO 3	KA095477
*		I:LUH

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

	driverjd	reg_num	report_num	damage_amount
▶	A01	KA052250	11	10000
	AO 2	KA031181	12	50000
	AO 3	KA095477	13	25000
	A04	KAO53408	14	3000
	AO 5	KA041702	15	5000
*	mini	HffJW	inirw	fnrm

Queries:

Update the damage amount to 25000 for the car with a specific reg-num (example 'KA053408') for which the accident report number was 14.

UPDATE participated set damage_amount=25000 WHERE reg_num='KA053408' AND report_num=14;
select * from participated;

driverjd reg_num report_num damage_amount ► A01 KAO 52250 11 10000

A0 2 KA031181 12 50000

A0 3 KA095477 13 25000

ACM KAO 53408 14 25000

AO 5 KA0417D2 15 5000

nim m i:mn mm

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

Add new accident to the database

INSERT into accident values(16,'2008-03-08','Dolmor');
select * FROM accident;

	report_num	accident_date	location
►	11	2003-01-01	Mysore Road
	12	2004-02-02	South End Cirde
	13	2003-01-21	Bull Temple Road
	14	2008-02-17	Mysore Road
	15	2004-03-05	Kanakpura Road
	16	2008-03-08	Dolmor
			i:i»m

More Queries on Insurance Database:

List all the entire participated relation in descending order of damage_amount

select * FROM participated ORDER BY damage_amount desc;

	driverjd	reg_num	report_num	damage_amount
►	A0 2	KA031181	12	50000
	AO 3	KA095477	13	25000
	A04	KAO53408	14	25000
	A01	KA052250	11	10000
	AO 5	KA041702	15	5000
.	nan	fmm	nrnn	

Find average damage_amount

select avg(damage_amount) from participated;

avg(damage_amount)
► j 23000.0000

Delete the tuple whose damage_amount is below average amount damage_amount

delete from participated where damage_amount
(
select avg_damage from(select avg(damage_amount) as avg_damage from participated)
as avg_table
);

set sql_safe_updates=0;

List the name of drivers whose damage is greater than the avg 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
	Smith
	Venu

Find the maximum damage_amount

select max(damageamount) from participated;

	max(damage_amount)
►	50000

Display accident date and location

select accident_date,location from accident;

	actident_date	location
►	2003-01-01	Mysore Road
	2004-02-02	South End Cirde
	2003-01-21	Bull Temple Road
	2008-02-17	Mysore Road
	2004-03-05	Kanakpura Road
	2008-03-08	Dolmor

Display driver_id who did accident with damage_amount>=25000

select driver_id from participated where damage_amount>=25000;

driverjd ► A02

A03 A04

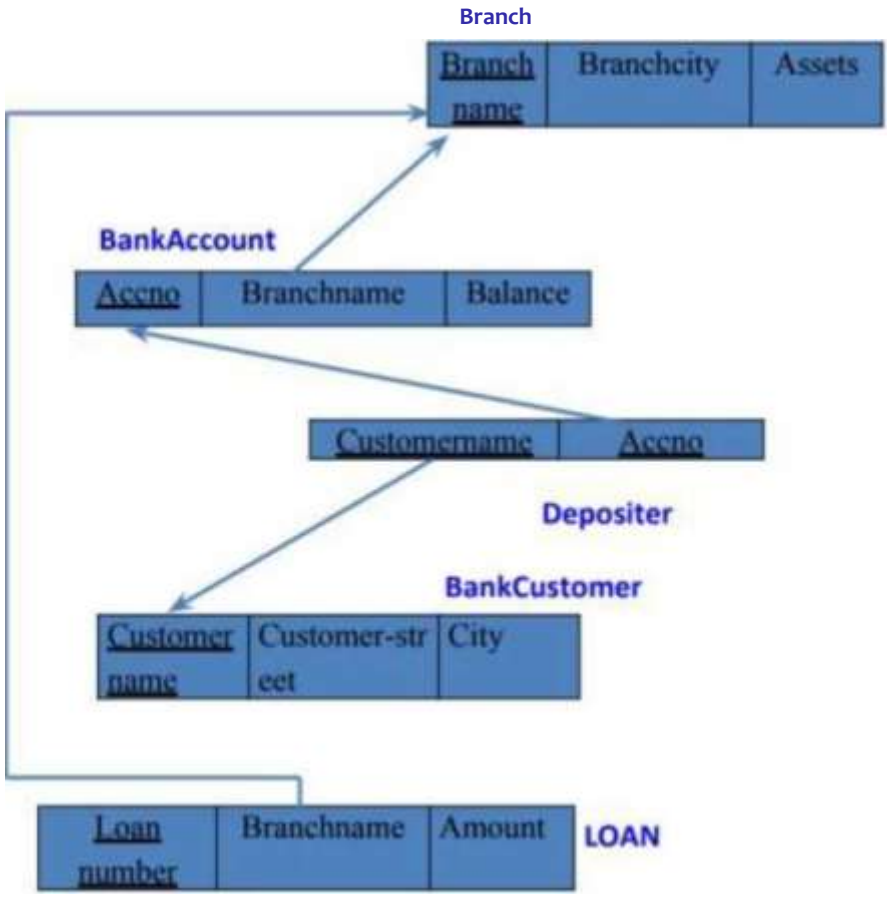
Bank Database

Question (Week 3)

- 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 BankDatabase_058;

use BankDatabase_058;
```

Create Table

```
create table Branch (
Branchname varchar(20),
Branchcity varchar(10),
Assets int,
PRIMARY KEY (Branchname)
);
```

```
create table BankAccount (
Accno int,
Branchname varchar(20),
Balance int,
PRIMARY KEY (Accno,Branchname),
FOREIGN KEY(Branchname) references Branch(Branchname)
);

create table BankCustomer (
Customername varchar(10),
Customerstreet varchar(20),
Customercity varchar(10),
PRIMARY KEY(Customername)
);

create table Depositor (
Customername varchar(10),
Accno int,
PRIMARY KEY (Customername,Accno),
FOREIGN KEY(Customername) references BankCustomer(Customername),
FOREIGN KEY(Accno) references BankAccount(Accno)
);

create table Loan (
Loannumber int,
Branchname varchar(20),
Amount int,
PRIMARY KEY (Loannumber,Branchname),
FOREIGN KEY(Branchname) references Branch(Branchname)
);
```

Structure of the table

```
desc Branch;
```

	Field	Type	Null	Key	Default Extra
▶	Branchname	varchar(20)	NO	PRI	
	Branchdty	varchar(lO)	YES		mini
	Assets	int	YES		l.'LHH

desc BankAccount;

	Field	Type	Null	Key	Default Extra
▶	Accno	int	NO	PRI	timid
	Branchname	varchar(20)	NO	PRI	limit
	Balance	int	YES		iiTim

desc BankCustomer;

	Field	Type	Null	Key	Default Extra
▶	Customername	varchar(lO)	NO	PRI	liimd
	Customerstreet	varchar(20)	YES		liTTJH
	Customerdty	varchar(lO)	YES		can

desc Depositor;

	Field	Type	Null	Key	Default	Extra
▶	Customername	varchar(10)	NO	PRI	NULL	
	Accno	int	NO	PRI	NULL	

desc Loan;

	Field	Type	Null	Key	Default Extra
▶	Loannumber	int	NO	PRI	liLUH
	Branchname	varchar(20)	NO	PRI	liLHH
	Amount	int	YES		1! LH ■ ■

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;

	Branchname	Branchdty	Assets
▶	SBI_Chamrajpet	Bangalore	50000
	SBI_Jantarmantar	Delhi	20000
	SBI_ParliamentRoad	Delhi	10000
	SBI_ResidencyRoad	Bangalore	10000
	SBI ShivajiRoad	Bombay	20000
*			

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	Branchname	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
lillIW	liimi	mini

insert into BankCustomer values('Avinash','BullTempleRoad ','Bangalore');
insert into BankCustomer values('Dinesh','BannergattaRoad','Bangalore');
insert into BankCustomer
values('Mohan','NationalCollegeRoad','Bangalore'); insert into
BankCustomer values('Nikil','AkbarRoad','Delhi'); insert into BankCustomer
values('Ravi','PrithvirajRoad','Delhi'); select * from BankCustomer;

	Customername	Customerstreet	Customerdty
▶	Avinash	Bull Temple Road	Bangalore
	Dinesh	Bannergatta Road	Bangalore
	Mohan	NationalCollegeRoad	Bangalore
	Nikil	Akbar Road	Delhi
	Ravi	Prithviraj Road	Delhi
		KITH*	

insert into Depositor value('Avinash',1);
insert into Depositor value('Dinesh',2);
insert into Depositor value(Nikil',4);
insert into Depositor value('Ravi',5);
insert into Depositor value('Avinash',8);
insert into Depositor value(Nikil',9);
insert into Depositor value('Dinesh',10);
insert into Depositor value('Ravi',11);
select * from Depositor;

	Customername	Accno
▸	Avinash	1
	Dinesh	2
	Nikil	4
	Ravi	5
	Avinash	8
	Nikil	9
	Dinesh	10
	Ravi	11
	liHITI	

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;

	Loannumber	Branchname	Amount
▶	1	SBI_Chamrajpet	1000
	2	SBI_ResidencyRoad	2000
	3	SBI_ShivajiRoad	3000
	4	SBI_ParliamentRoad	4000
	5	SBI_Jantarmantar	5000
*	NULL	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 Branchname, Assets as Asset in lakhs from Branch;

	Branchname	Asset_in_lakhs
▶	SBI_Chamrajpet	50000
	SBIJantarmantar	20000
	SBI_ParliamentRoad	10000
	SBI_ResidencyRoad	10000
	SBI ShivajiRoad	20000
*	B1CT1	liliJll

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

select Customername , Branchname from Depositor D, BankAccount B

where D.Accno=B.Accno group by Customername,Branchname having count(B.Accno)>=2;

	Customername	Branchname
▶	Dinesh	SBI_ResidencyRoad
	Nikil	SBI_ParliamentRoad
	Ravi	SBIJantarmantar

Create a view which gives each branch the sum of the amount of all the Loans at the Branch.

Create view Branch_Loan_Sum as select Branchname, sum(Amount) as total_loan_amount from Loan group by Branchname;

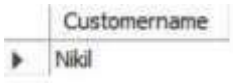
	Branchname	total_loan_amount
▶	SBI_Chamrajpet	1000
	SBI_Jantarmantar	5000
	SBI_ParliamentRoad	4000
	SBI_ResidencyRoad	2000
	SBI_ShivajiRoad	3000

More Queries on Bank Database:

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

SELECT DISTINCT d.Customername FROM Depositor D JOIN BankAccount BA ON D.Accno=BA.Accno JOIN Branch b on BA.Branchname=b.Branchname WHERE b.Branchcity='Delhi' GROUP BY d.Customername

HAVING COUNT(DISTINCT BA.BranchnameMSELECT COUNT(B2.Branchname) FROM Branch B2 WHERE B2.Branchcity='Delhi');



	Customername
▶	Nikil

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

SELECT DISTINCT B.Customername FROM Borrower B LEFT JOIN Depositor d On B.Customemame=d.Customemame WHERE d.Customemame IS NULL;

Customemame Mohan

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

SELECT DISTINCT d.Customemame FROM Depositor D JOIN BankAccount BA ON D.Accno=BA.Accno JOIN Loan l on BA.Branchname=l.Branchname WHERE BA.Branchname-Bangalore' AND l.Branchname-Bangalore';

Customemame

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

SELECT B.Branchname FROM Branch b where b.Assets>(SELECT MAX(b.Assets) FROM Branch B WHERE B.Branchcity-Bangalore');

Branchname ► SBI_MantriMarg

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

DELETE FROM BankAccount WHERE Branchname IN (SELECT Branchname FROM Branch WHERE Branchcity='Bombay'); select * from BankAccount;

	accno	Branchname	Balance
▶	1	S81_Chamrapet Road	2000
	2	SK_ReadencY Road	SOOO
	4	S8t_Partament Road	9000
	5	SfHJantarMantar	8000
	8	S81_Resdency Road	4000

Update the Balance of all accounts by 5%.

UPDATE BankAccount SET Balance=Balance*1.05;
select * from BankAccount;

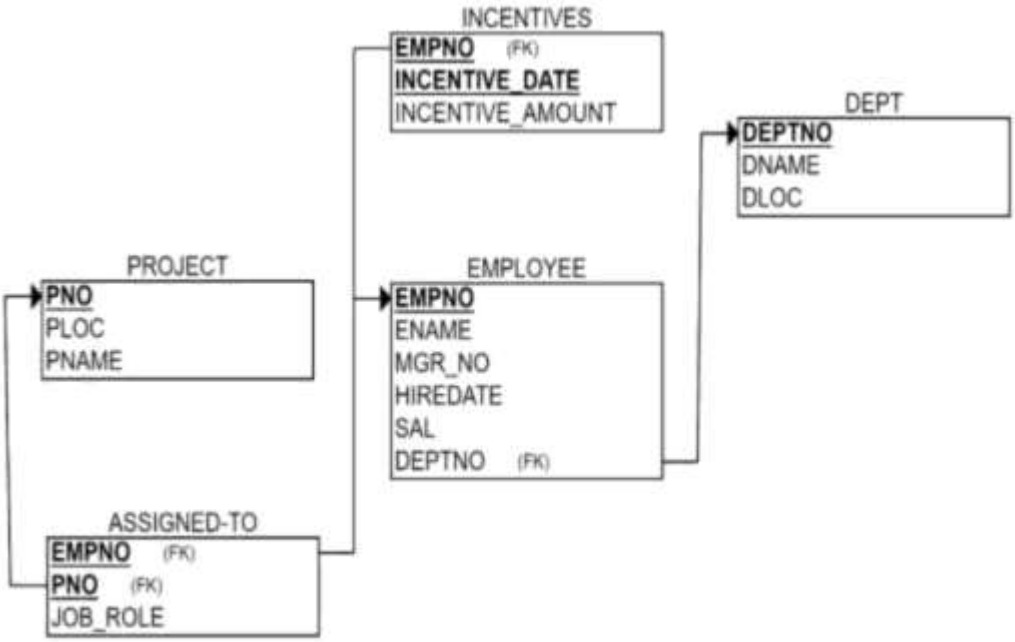
	Accno	Branchname	Balance
▶	1	SBI_Chamrajpet	2431
	2	SBI_ResidencyRoad	6078
	4	SBI_ParliamentRoad	10940
	5	SBIJantarmantar	9724
	8	SBI_ResidencyRoad	4863
	9	SBI_ParliamentRoad	3647
	10	SBI_ResidencyRoad	6078
	11	SBIJantarmantar	2431
	12	SBI_MantriMarg	2315
a	liUJll	mini	I!HJH

Employee Database

Question
(Week 5)

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.

Schema Diagram



Create Database

```
create database employee_Database_058;
use employee_Database_058;
```

Create Table

```
create table Dept(
Deptno int,
Dname varchar(50),
Dloc varchar(50),
primary key (Deptno)
);

create table Project(
Pno int,
Pname varchar(50),
Ploc varchar(50),
PRIMARY KEY(Pno)
);

create table Employee(
Empno int,
Ename varchar(50),
Mgrno int,
```

```
Hiredate date,
Sal int, Deptno int, primary key (Empno, Deptno),
foreign key(Deptno) REFERENCES
Dept(Deptno)
);

create table Incentive (
Empno int,
Incentivedate date, Incentiveamount int, primary
key(Incentivedate, Empno), foreign key (Empno)
REFERENCES Employee(Empno)
);

create table AssignedTo(
Empno int,
Pno int,
Jobrole varchar(50),
primary key(Empno, Pno),
foreign key(Empno)
references
Employee(Empno), foreign
key(Pno) references
Project(Pno)
);
```

Structure of the table

desc Dept;

	Field	Type	Null	Key	Default Extra
▶	Deptno	int	NO	PRI	mini
	Dname	varchar(50)	YES		lium
	Dloc	varchar{50)	YES		limn

desc Project;

	Field	Type	Null	Key	Default Extra
▶	Pno	int	NO	PRI	mm
	Pname	varchar(50)	YES		liUJllf
	Ploc	varchar(50)	YES		iami

desc Employee;

	Field	Type	Null	Key	Default Extra
►	Empno	int	NO	PRI	rtnw
	Ename	varchar(50)	YES		limn
	Mgmo	int	YES		nan
	Hiredate	date	YES		liLUll
	Sal	int	YES		nan
	Deptno	int	NO	PRI	nan

desc Incentive;

	Field	Type	Null	Key	Default Extra
►	Empno	int	NO	PRI	nrm
	Incentivedate	date	NO	PRI	KL'iH
	Incentiveamount	int	YES		I!WH

desc AssignedTo;

	Field	Type	Null	Key	Default Extra
►	Empno	int	NO	PRI	rum
	Pno	int	NO	PRI	nuu«
	Jobrole	varchar(50)	YES		iiim«

Inserting Values to the table

insert into Dept values(10, 'Computer Science', 'San Francisco');
insert into Dept values(20, 'Information Systems', 'New York');
insert into Dept values(30, 'Mechanical Engineering', 'Los Angeles'); insert into Dept values(40, 'Electrical Engineering', 'Boston'); insert into Dept values(50, 'Electronics', 'Chicago'); insert into Dept values(60, 'Human Resources', 'Austin'); select * from Dept;

	Deptno	Dname	Dloc
►	10	Computer Science	San Francisco
	20	Information Systems	New York
	30	Mechanical Engineering	Los Angeles
	40	Electrical Engineering	Boston
	50	Electronics	Chicago
	60	Human Resources	Austin
.	[rum	nnjw	litljUM

insert into Project values (1, 'Market Research', 'Hyderabad');
insert into Project values (2, 'Software Update', 'Bengaluru');
insert into Project values (3, 'Product Launch', 'Mysuru');
insert into Project values (4, 'Website Redesign', 'Boston');
insert into Project values (5, 'Customer Support', 'Chicago');
insert into Project values (6, 'Employee Training', 'Austin');
select * from Project;

	Pno	Pname	Ploc
▶	1	Market Research	Hyderabad
	2	Software Update	Bengaluru
	3	Product Launch	Mysuru
	4	Website Redesign	Boston
	5	Customer Support	Chicago
	6	Employee Training	Austin
.	lium	i;nm	lium

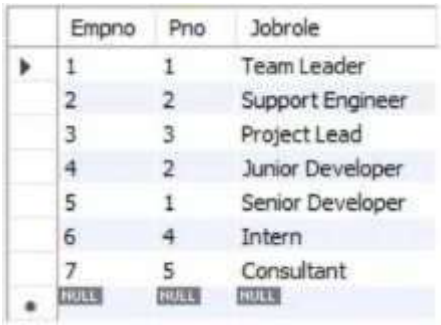
insert into Employee values(1, 'Alice', 3, '2010-02-25', 72000, 10); insert into Employee values(2, 'Bob', 3, '2008-05-18', 56000, 20); insert into Employee values(3, 'Charlie', NULL, '2005-08-12', 90000, 10); insert into Employee values(4, 'David', 2, '2001-09-05', 65000, 20); insert into Employee values(5, 'Eve', 1, '2004-03-23', 71000, 30); insert into Employee values(6, 'Frank', 5, '2007-06-14', 51000, 30); insert into Employee values(7, 'Grace', 2, '2003-11-10', 78000, 40); select * from Employee;

	Empno	Ename	Mgrno	Hiredate	Sal	Deptno
▶	1	Alice	3	2010-02-25	72000	10
	2	Bob	3	2008-05-18	56000	20
	3	Charlie	NULL	2005-08-12	90000	10
	4	David	2	2001-09-05	65000	20
	5	Eve	1	2004-03-23	71000	30
	6	Frank	5	2007-06-14	51000	30
	7	Grace	2	2003-11-10	78000	40
*	NULL	NULL	NULL	NULL	NULL	NULL

insert into Incentive values(1, '2024-11-01', 5500);
insert into Incentive values(3, '2023-12-15', 9500);
insert into Incentive values(4, '2022-07-20', 3500);
insert into Incentive values(5, '2024-11-05', 4200);
insert into Incentive values(6, '2020-10-10', 4800);
insert into Incentive values(7, '2024-11-03', 8200);
select * from Incentive order by Empno asc;

	Empno	Incentivedate	Incentiveamount
▶	1	2024-11-01	5500
	3	2023-12-15	9500
	4	2022-07-20	3500
	5	2024-11-05	4200
	6	2020-10-10	4800
	7	2024-11-03	8200
*	:nm	imm	imm

insert into AssignedTo values(1, 1, 'Team Leader');
insert into AssignedTo values(2, 2, 'Support
Engineer'); insert into AssignedTo values(3, 3, 'Project
Lead'); insert into AssignedTo values(4, 2, 'Junior
Developer'); insert into AssignedTo values(5, 1,
'Senior Developer'); insert into AssignedTo values(6,
4, 'Intern'); insert into AssignedTo values(7, 5,
'Consultant'); select * from AssignedTo;



Empno	Pno	Jobrole
1	1	Team Leader
2	2	Support Engineer
3	3	Project Lead
4	2	Junior Developer
5	1	Senior Developer
6	4	Intern
7	5	Consultant
NULL	NULL	NULL

Queries :

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

SELECT a.EMPNO FROM AssignedTo a
JOIN Project p ON a.Pno = p.Pno
WHERE p.Ploc IN ('Bengaluru', 'Hyderabad', 'Mysuru');

EMPNO
1
5
2
4
3

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

select Empno from Employee e where Empno Not in(select Empno from Incentive);

Empno
2

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.Deptno, a.Jobrole, d.Dloc, p.Ploc FROM Employee e, Dept d, Project p, Assignedto a

WHERE e.Deptno = d.Deptno AND e.Empno = a.Empno AND a.Pno = p.Pno AND d.Dloc =
p.Ploc; **Ename Empno Deptno Jobrole Dloc Ploc**

More Queries on Employee Database:

List the name of the managers with the maximum employees.

select e.Mgmo as managerid from Employee e join Employee m on e.Mgmo = m.Empno group by e.Mgmo having count(e.Empno) = (select max(employeecount) from (select count(Empno) as employeecount from Employee where Mgrno is not null group by Mgrno) as managercounts);

managerid
3
2

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

select m.Empno as managerid,m.Ename as managername,m.Sal as managersalary from Employee m where m.Sal >(select avg(e.Sal) from Employee e where e.Mgrno = m.Empno);

	managerid	managername	managersalary
▶	1	Alice	72000
	3	Charlie	90000
	5	Eve	71000

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

select distinct e1.Ename as second_manager from Employee e1 where e1.Empno in (select distinct e2.Mgrno from Employee e2 where e2.Mgrno is not null);

	second_manager
▶	Charlie
	Bob
	Alice
	Eve

Find the employee details who got second maximum incentive in November 2024.

select Empno,Incentivedate,Incentiveamount from Incentive where Incentivedate between '2024-11-01' and '2024-11-05' order by Incentiveamount desc ;

	Empno	Incentivedate	Incentiveamount
▶	7	2024-11-03	8200
	1	2024-11-01	5500
	5	2024-11-05	4200
*	BW	li'imi	i;imi

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

select e.Empno as employeelD, e.Ename as employeename, e.Deptno as departmentid from Employee e Join Employee m on e.Mgmo = m.Empno where e.Deptno = m.Deptno; **employeelD employeename departmentid**

► **1 Alice 10**

4 David 20

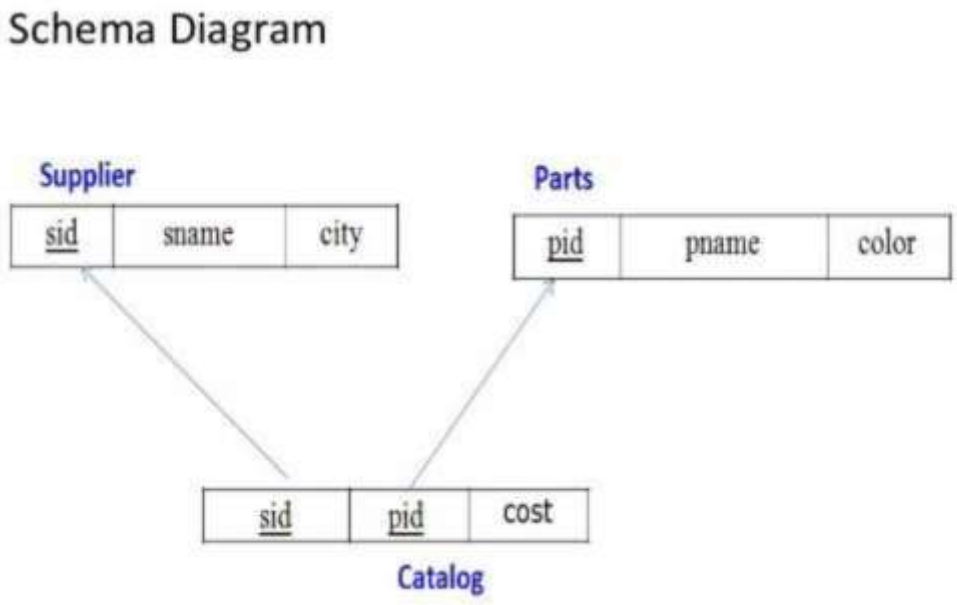
6 Frank 30

Supplier Database

Question (Week 7)

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_database_058;

use supplier_database_058;
```

Create Table

```
create table Supplier
```

(

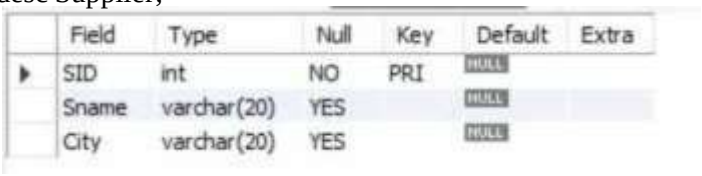
SID int,
Sname varchar(20),
City varchar(20),
PRIMARY KEY(SID)
);

create table Parts (
PID int,
Pname varchar(20),
Color varchar(20),
PRIMARY KEY(PID)
);

create table Catalog (
SID int,
PID int,
Cost int,
PRIMARY KEY(SID,PID),
FOREIGN KEY(SID) references Supplier(SID),
FOREIGN KEY(PID) references Parts(PID)
ON DELETE CASCADE ON UPDATE
CASCADE);

Structure of the table

desc Supplier;



	Field	Type	Null	Key	Default	Extra
▶	SID	int	NO	PRI	NULL	
	Sname	varchar(20)	YES		NULL	
	City	varchar(20)	YES		NULL	

desc Parts;

	Field	Type	Null	Key	Default Extra
▶	PID	int	NO	PRI	lium
	Pname	varchar(20)	YES		i;m<i
	Color	varchar(20)	YES		Hum

desc Catalog;

	Field	Type	Null	Key	Default	Extra
▶	SID	int	NO	PRI	NULL	
	PID	int	NO	PRI	NULL	
	Cost	int	YES		NULL	

Inserting Values to the table

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'); select * from Supplier;

	SID	Sname	City
▶	10001	Acme Widget	Bangalore
	10002	Johns	Kolkata
	10003	Vimal	Mumbai
	10004	Reliance	Delhi
*	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 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 liimi	Black liimi
.			

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
	10001	20002	10
	10001	20003	30
	10001	20004	10
	10001	20005	10
	10002	20001	10
	10002	20002	20
	10003	20003	30
	10004	20003	40
*	NULL	NULL	NULL

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

```
SID NOT IN( select s.SID from Supplier s , Parts p where p.PID NOT
IN(select c.PID from Catalog c where c.SID=s.SID));
```

Sname

Acme Widget

Find the snames of suppliers who supply every red part.

```
select Sname from Supplier where
SID NOT IN( select s.SID from Supplier s , Parts p
where p.Color='Red' and p.PID NOT IN(select c.PID from Catalog c where c.SID=s.SID));
```

Sname

Acme Widget

Johns

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

```
SELECT p.Pname FROM Parts p JOIN Catalog c ON p.PID = c.PID JOIN Supplier s ON c.SID = s.SID
WHERE s.Sname = 'Acme Widget'
AND NOT EXISTS (

  SELECT 1 FROM Catalog c1 JOIN
  Supplier s1 ON c1.SID = s1.SID
  WHERE c1.PID = p.PID AND
  s1.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_cost_table on c.PID=avg_Cost_table.PID where
c.Cost>avg_Cost_table .Avg_Cost;
```

SID

10002

10004

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

select p.PID,s.Sname from Supplier s join Catalog c on s.SID=c.SID join Parts p on c.PID=p.PID where c.Cost=(select max(c2.Cost) from Catalog c2 where c2.PID=p.PID);

PID	Sname Acme
20001	Widget Johns
20001	Johns
20002	Reliance Acme
20003	Widget Acme
20004	Widget
20005	

NoSQL Student Database

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.

Queries:

1. Create a database “Student” with the following attributes Rollno,Age, ContactNo, Email-Id. db.createCollection("Student");

```
For mongosh info see: https://docs.nongodb.coei/niongodb-shell/

Atlas atlas-nozg5o-shard-0 [primary] test> db.createCollection('S' r>-' ); {
ok: 1 ]
Atlas atlas-mozg5o-shard-0 [primary] test> show dbs
Student    72.08    KiB
test    8.00    KiB
admin    328.00    KiB
local    88.62    GiB
Atlas atlas-nozg5o-shard-0 [primary] test> |
```

2. Insert appropriate values

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:"pam.de9@gmail.com"});

db.Student.insert((RollNo:10.Age:23.Cont:2276.email:"rekha.de9@gmail.com"i);

```
Atlas atlas-okge9d-shard-0 [primary] test> db.Student.insert({RollNo:1,Age:21,Cont:9876,email:"antara.de9@gmail.com"}); DeprecationWarning:
Collection.insertO is deprecated. Use insertOne, insertMany, or bulkWrite.
{
acknowledged: true,
insertedlds: { '0': ObjectId('67U6b7a6effbfb92d32f8ela›0 }
}

Atlas atlas-okge9d-shard-0 [primary] test> db.Student.insert({RollNo:2,Age:22,Cont:9976 ₍ email:"anushka devSgnai1.con"});

{
acknowledged: true,
insertedlds: { '0': Objectld("67a6b7-Fb0ffbfb92d32f8elb"] }
}

Atlas atlas-okge9d-shard-0 [primary] test> db.Student.insert({RollNo:3,Age:21,Cont:5576,email:"anubhav.de9@gmail.com"}];

{
acknowledged: true,
insertedlds: { 'O': ObjectId("67U6b8060-ffbfb92d32-f8elc"] }
}
Atlas atlas-okge9d-shard-0 [primary] test> db.Student.insert({RollNo:d,Age:20,Cont:UU76,email:"pani.de9@gmail.com"}];
{
acknowledged: true,
insertedlds: { '0›': ObjectId("67U6b8110f-fbfb92d32f8eld"] }
}
Atlas atlas-okge9d-shard-0 [primary] test> db. Student. insert ({RollNo: 10, Age: 23, Cant: 2276, email: "rekha. de9(tigmail. com"}];
{
acknowledged: true,
insertedlds: { '0': ObjectIdC"67^6b8180^:■fbfb92d32■f8ele››) }
}
```

3.)Write query to update Email-Id of a student with rollno 10.

db.Student.update(iRollNo: 10j.!$sct: !cmail:"Abhinav@.gmail.com"il)

```
Atlas atlas-okge9d-shard-0 [primary] test> db.Student.update({RollNo:18},{$set:{email:"Abliinavlgmail.com }})
DeprecationWarning: Collection.updateO is deprecated. Use updateOne, updateHany, or bulkWrite.
{
acknowledged: true, insertedld: null, matchedCount: 1, modi-f iedCount: 1, upsertedCount: 0
}
```

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

db.Student.insert('{RollNo:11.Age:22.Name:"ABC".Cont:2276.email:"rea.de9@gmail.com"}')
;

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

```
Atlas atlas-okge9d-shard-0 [primary] test> db.Student.updateC{RollNo:11,Name:"'AB' }, {$set:{Name:    }})
{
acknowledged: true, insertedld: null, matchedCount: 1, modi-f iedCount: 1, upsertedCount: 0
}
id: ObjectId("63bfd4de56eba0e23c3a5c78"I RollNo: 11,
Age: 22,
Name: 'ABC',
Cont: 2276,
email: 'rea.de90gmail.com'
```

```
_id: ObjectId(”63bfd4de56eba0e23c3a5c78"),
RollNo: 11,
Age: 22,
Name: 'FEM',
Cont: 2276,
email: 'rea.de93gmail.com'
}
```

	Id	RollNo	Ago	Coni	email	Nome
2	6746b6c4f73lea43l1	1	21		9676 anlara.de9Qgmall.com	
3	6746b6cbf73lea43l1	2	22		9976 anj9ika.de9Qgmaii.com	
4	6746b6d2f73fea43M	3	21		5576 anubnavde9Qgmail.com	
5	6746b6d8f73leo43M	4	20		4476 oeni de9Qgmall.com	
6	6746b6def73tea43H	10	23		2276 AbninavQgma l.com	
7	6746b710f73fea43»1	11	22		2276 ma de3@gma ıı com FEM	

NoSQL Customer Database

Question (Week 9)

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 local file system into mongodb collection.

QUERIES

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

Cust_id, Acc_Bal, Acc_Type.

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

```
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"}]);
```

```
For mongosh info see: https://docs.nongodb.con/mongodb-shett/

Atlas atlas-zkql51-shard-6 [primary] test> db.createCollection("C„ •    );
{ ok: 1 >
Atlas  atlas-zkql51-shard-0  [primary]  test>  db.Customer.insertrtany([{custid:  1,  acc_bal:10600,  aec.typi
acc_type:
... ''Saving'}, {custid: 1, acc_bal:20000, acc_type: 'Check.m}, {custid: 3,
... acc_bal:50600, acc_type: "Checking¹}, {custid: U, acc_bal:10060,
... acc_type: Saving"}, {custid: 5, acc_bal:2066, acc_type: "Checking¹'}]);
{
acknowledged: true, insertedlds: {
’  0':  Obj  ectld  C  *67dff209U6bdcdlffe0d55a3  "  ),  i':  ObjectIdC"67Uff209U6bUcdlffe0d5SaU")ɪ  :  '  :
Objectld(”67dff209U6bdcdlffe9d55a5"),
': ObjectId("67Uff209<^6b«cdlffe0d55a6‹›),
U': Obj ectId(* 67dff209U6bUcd1ffe0d55a7")
}
```

2. Write a query to display those records whose total account balance is greater than 12000 of account type ‘Z’ for each customer_id.

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

```
Atlas atlas-zkql51-shard-0 [primary] test> db.Customer.•find({acc_bat: {$gt: 12600}, acc.type:"
D;
C
{
_id: ObjectIdC'67Uff209O6bOcdIffe0d55ad"), custid: 1, acc.bal: 26000,
acc_type: 'Checking'
>,
{
_id: Ob ject Id C “ 67U-f-f209U6b4cd If ■feOdSSaS" ), custid: 3, acc.bal: 50060, acc_type: 'Checking'
>
]
```

3. Determine Minimum and Maximum account balance for each customer_id.

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

```
Atlas atlas-zkql51-shard-0 [primary] test> db. Customer aggregate([{5 i    -■ - ; - •. -    ,    . • • : {Smin
Sm-.n:    }, maxBal:
... {Smax: ¹ S.i t }}>]);
[
{ _id:    5,    minBal:    2000, maxBal: 2000 },
{ _id:    3,    minBal:    50000,    maxBal:    50000    },
{ .id:    *4,    minBal:    10000,    maxBal:    10600    },
{ _id:    1,    minBal:    10000,    maxBal:    26006    }
```

4. Export the created collection into local file system

5. Drop the table

db.Customer.drop();

```
test> db.Customer.drop();
true
```

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

1	.id cuitid	•cc.bai		•cc type
2	674f120946b4cdin»	1	10000	Saving
3	674«20946b4cd11te	1	20000	CnecWng
4	674«20946b4cd1«»	3	50000	ChecMng
5	674«20946b4cd1«e	4	10000	Saving
6	674112094 6 b4cd1 He	5	2000	CnecMna

NoSQL 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 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.

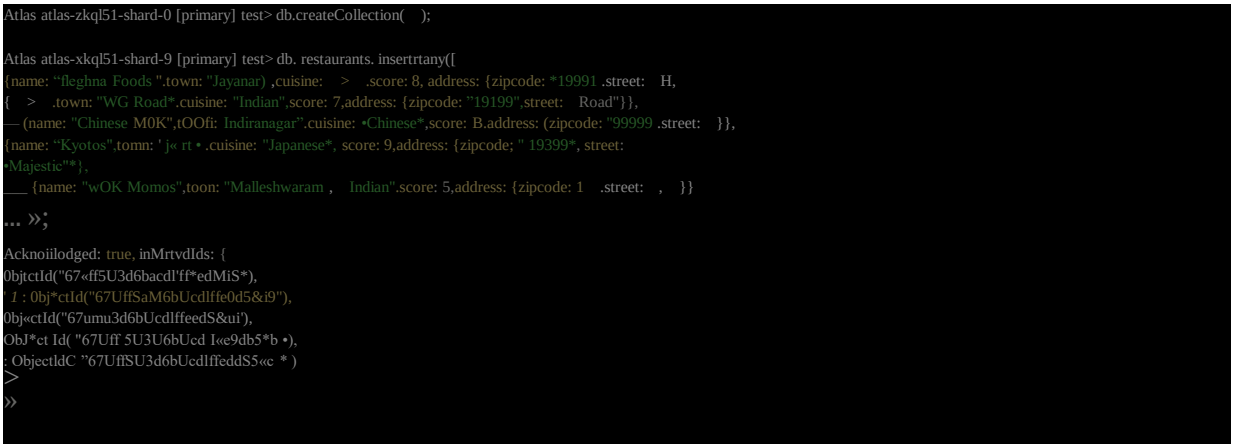
5. Write a MongoDB query to find the name and address of the restaurants that have a zipcode that starts with '10'.

QUERIES

1.In MongoDB create a collection for “Restaurant” and insert atleast five records

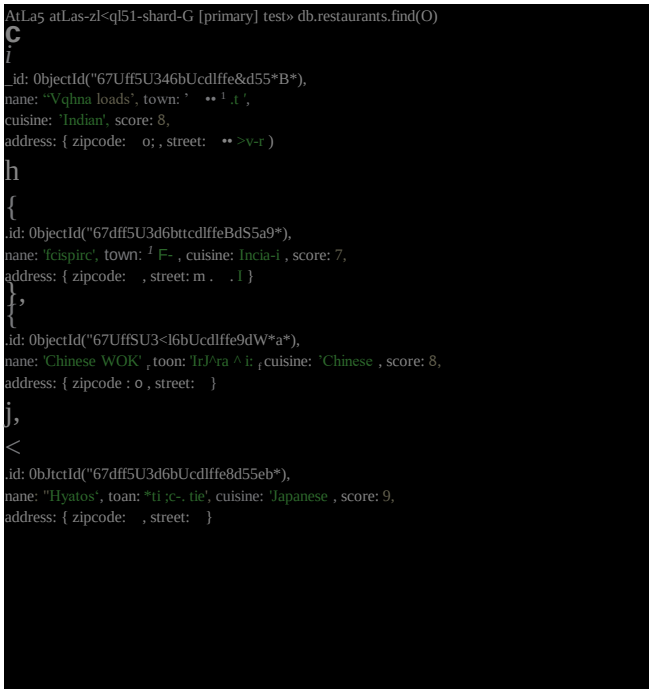
db.createCollection("restaurants");

{ 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" }}])



2. Write a MongoDB query to display all the documents in the collection restaurants.

db.re staurants.find({})

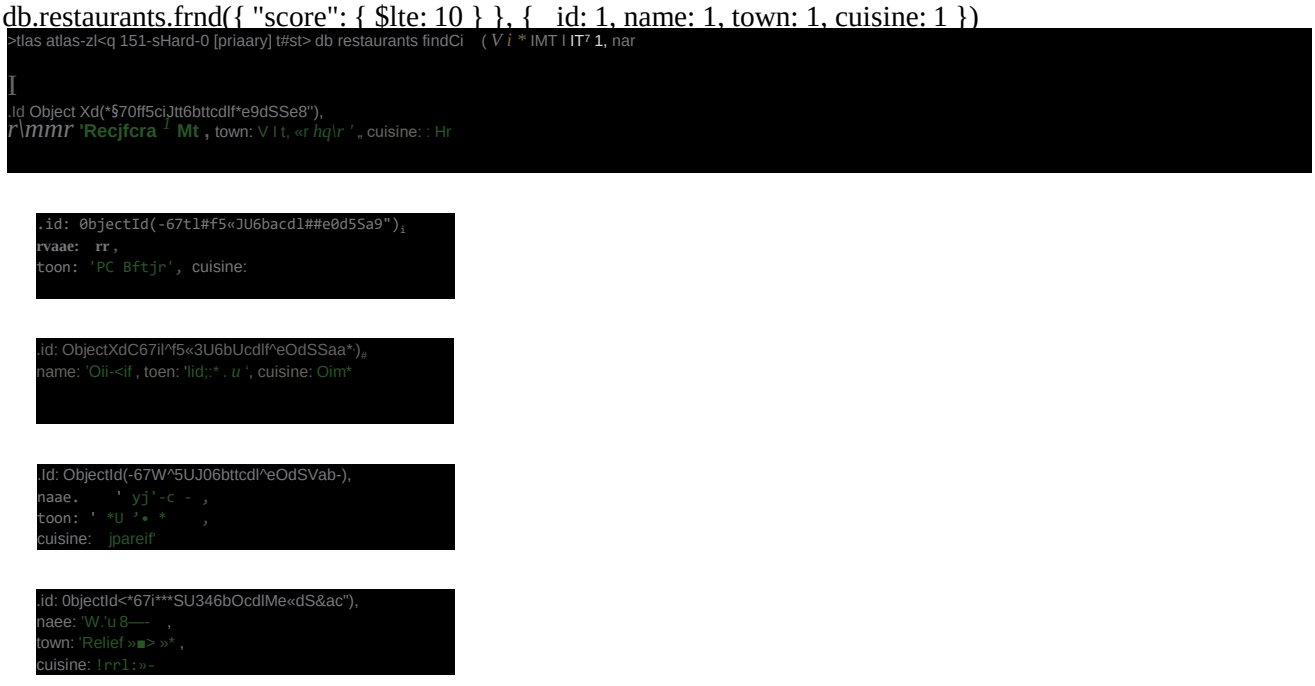


3.Write a MongoDB query to arrange the name of the restaurants in descending along with all the columns.

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

4.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.

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

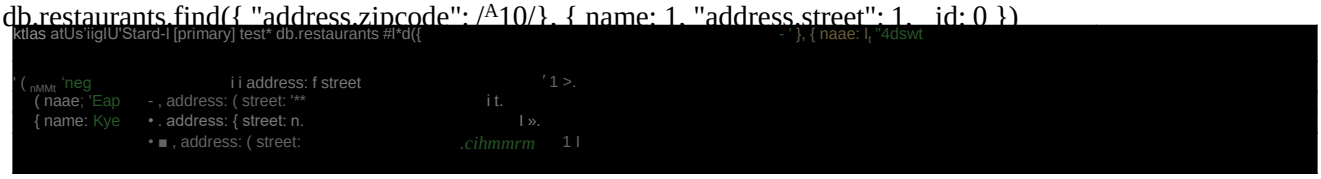


5.Write a MongoDB query to find the average score for each restaurant.

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

6.Write a MongoDB 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 })



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