Indian Institute of Information Technology Vadodara

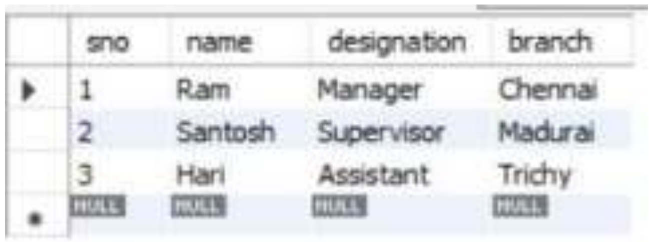
CS262: Database Management System

Lab 6

Roll No. 201951105 **Name: Nishant Andoriya**

Question 1.) Create a Table as employee and the details are S.No Name Designation Branch
1 Ram Manager Chennai
2 Santhosh Supervisor Madurai
3 Hari Assistant Trichy

```
create table Employee(
    sno int,
    name varchar(20),
    designation varchar(20),
    branch varchar(20),
    primary key(sno)
);
insert into Employee values(1 , 'Ram', 'Manager', 'Chennai'); insert into
Employee values(2 , 'Santosh', 'Supervisor', 'Madurai');
insert into Employee values(3 , 'Hari', 'Assistant', 'Trichy'); select *from
Employee;
```



	sno	name	designation	branch
▶	1	Ram	Manager	Chennai
	2	Santosh	Supervisor	Madurai
	3	Hari	Assistant	Trichy
*	NULL	NULL	NULL	NULL

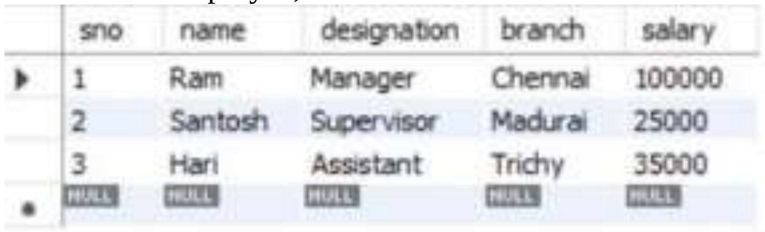
Perform the following:

♣ Alter the table by adding a column Salary

-- 1

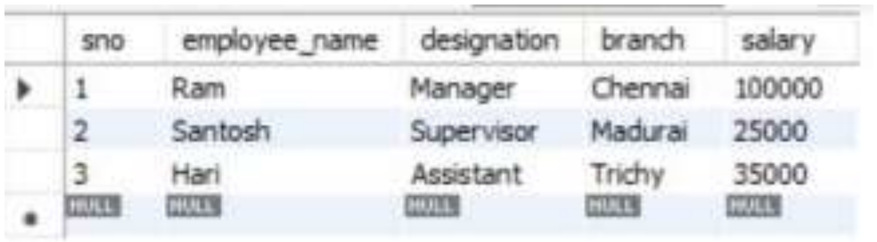
```
ALTER table Employee
Add salary int ;
Update Employee
Set salary = 100000
where sno =1;

Update Employee
Set salary = 25000
where sno =2;
```

Update Employee
Set salary = 35000
where sno =3;
select *from employee;



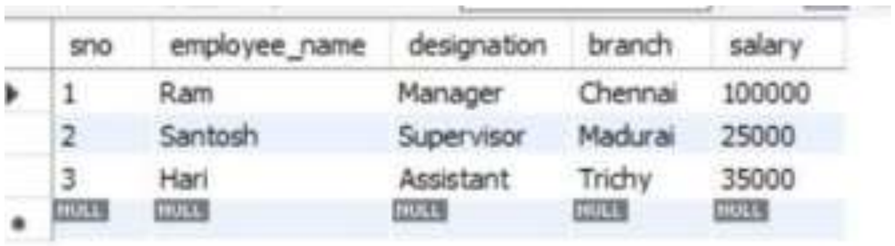
sno	name	designation	branch	salary
1	Ram	Manager	Chennai	100000
2	Santosh	Supervisor	Madurai	25000
3	Hari	Assistant	Trichy	35000
NULL	NULL	NULL	NULL	NULL

♣ **Alter the table by modifying the column Name Describe the table employee as employeeName**
Alter table Employee
change name employee_name char(20);
select *from employee;



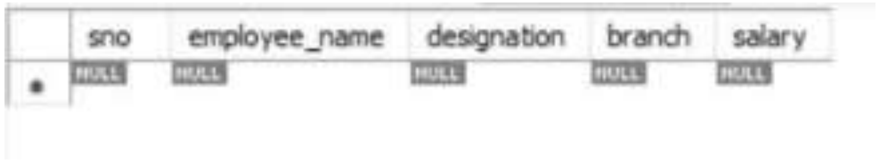
sno	employee_name	designation	branch	salary
1	Ram	Manager	Chennai	100000
2	Santosh	Supervisor	Madurai	25000
3	Hari	Assistant	Trichy	35000
NULL	NULL	NULL	NULL	NULL

♣ **Copy the table employee as emp**
CREATE TABLE emp AS
SELECT *
FROM Employee;
select *from emp;



sno	employee_name	designation	branch	salary
1	Ram	Manager	Chennai	100000
2	Santosh	Supervisor	Madurai	25000
3	Hari	Assistant	Trichy	35000
NULL	NULL	NULL	NULL	NULL

♣ **Truncate the table**
truncate table employee;
select *from employee;



sno	employee_name	designation	branch	salary
NULL	NULL	NULL	NULL	NULL

♣ **Delete the Second row from the table**
delete from employee where sno=2;
select *from employee;

	sno	employee_name	designation	branch	salary
*	NULL	NULL	NULL	NULL	NULL

♣ **Drop the table**

drop table Employee;

Question 2.) Consider the following relational schema for the Office of the Controller of Examinations Application.

Student (<u>Rollno</u>, Name, Dob, Gender, Doa, Bcode);

Implement a check constraint for

- **Gender**

Branch (<u>Bcode</u>, Bname, Dno);

Department (<u>Dno</u>, Dname);

Course (<u>Ccode</u>, Cname, Credits, Dno);

Branch_Course (<u>Bcode</u>, <u>Ccode</u>, Semester);

Enrolls (<u>Rollno</u>, <u>Ccode</u>, <u>Sess</u>, Grade);

Implement a check constraint for grade Value Set (‘S’, ‘A’, ‘B’, ‘C’, ‘D’, ‘E’, ‘U’);

Students are admitted to Branches and they are offered by Departments. A branch is offered by only one department.

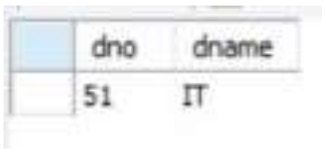
Each branch has a set of Courses (Subjects). Each student must enroll during a semester. Courses are offered by Departments. A course is offered only by one department. If a student is unsuccessful in a course he/she must enroll for the course during next session. A student has successfully completed a course if the grade obtained by is from the list (A, B, C, D, and E).

A student is unsuccessful if he/she have grade ‘U’ in a course.
Primary Keys are underlined.

```
create database Exam;

use Exam;

create table Student(

    id int ,

    name varchar(20),

    dob date,

    doa date,
        bcode int,

        gender varchar(10),
        check (gender in('Male','Female')),
        primary key(id)
    );


    create table Branch(

        bcode int primary key,

        bname varchar(20),

        dno int

    );


    create table Department(

        dno int ,

        dname varchar(20),

        primary key(dno)

    );


    create table Course(

        Ccode int,

        Cname varchar(20),

        credits int,

        dno int,

        primary key(Ccode)

    );


create table Branch_Course(
    bcode int,
        Ccode int ,

        Semester int,
    primary key(bcode,Ccode)
);

create table Enroll(
    id int ,
    Ccode int,
    Sess varchar(20),
    Grade varchar(3),
    check(Grade in('S', 'A', 'B', 'C', 'D', 'E', 'U')),
    primary key(id,Ccode,Sess)
);

insert into Student values(001,'Sidhant','2000-11-29','2020-07-24','100','Male');

insert into Student values(002,'Vedh','2001-12-20','2020-07-30','100','Male');

 insert into Student values(003,'Yashwardhan','2001-06-24','2020-07-23','101','Male');

 insert into Student values(004,'Deepak','2001-02-27','2019-11-30','102','Male');

insert into Student values(005,'Arushi','2000-10-02','2020-07-27','103','Female');

insert into Student values(006,'Subhanghi','2000-03-21','2020-07-26','104','Female');

insert into Student values(007,'Abhishek','2000-10-28','2020-07-25','105','Male');

 insert into Student values(008,'Akshay','2000-10-28','2020-07-25','105','Male');

insert into Branch values(100,'Computer Science',1001);
insert into Branch values(101,'Electronics',1002);

insert into Branch values(102,'Mechanical',1003);

insert into Branch values(103,'Biology',1004);

insert into Branch values(104,'BA',1005);

insert into Branch values(105,'Metallurgy',1006);

insert into Branch values(106,'Electrical',1007);


insert into Department values(51,'IT');
insert into Department values(52,'Medical');
insert into Department values(53,'Arts');


insert into Course values(201,'Discrete Maths',3,51);


insert into Course values(202,'Data Structure',5,51);


 insert into Course values(203,'Algorithms',5,51);


 insert into Course values(204,'Economics',3,52);


 insert into Course values(205,'Technical Writing',2,53);


insert into Course values(206,'Networks',4,52);


 insert into course values(207,'Probability',4,51);


insert into Branch_Course values(101,201,2);
insert into Branch_Course values(102,201,2);
insert into Branch_Course values(103,202,3);
insert into Branch_Course values(105,203,3);
insert into Branch_Course values(100,204,4);
insert into Branch_Course values(104,201,3);
insert into Branch_Course values(106,201,4);


insert into Enroll values(1,201,'2020-19','A');
insert into Enroll values(2,202,'2019-20','B');
insert into Enroll values(3,203,'2019-20','C');
insert into Enroll values(4,204,'2019-20','D');
insert into Enroll values(5,204,'2020-19','S');
insert into Enroll values(5,205,'2020-19','S');
insert into Enroll values(6,206,'2020-19','S');
insert into Enroll values(6,207,'2020-19','S');
insert into Enroll values(5,201,'2020-19','S');
insert into Enroll values(6,202,'2019-20','S');
insert into Enroll values(7,203,'2019-20','C');

insert into Enroll values(8,204,'2019-20','D');
```

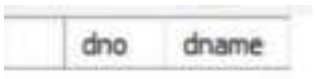
a.) Develop a SQL query to list details of Departments that offer more than 3 branches.

```
with dno_no as (select dno,count(dno)as number from course group by dno) select *
from department where dno in(select dno from dno_no where number>3);
```



dno	dname
51	IT

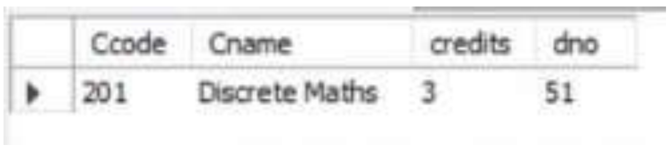
b.) **Develop a SQL query to list the details of Departments that offer more than 6 courses.**



dno	dname

c.) **Develop a SQL query to list the details of courses that are common for more than 3 branches.**

```
with Ccode_no as (select Ccode,count(Ccode) as number from Branch_course
group by Ccode) select * from course where Ccode in(select Ccode from
Ccode_no where number>3);
```



Ccode	Cname	credits	dno
201	Discrete Maths	3	51

d.) **Develop a SQL query to list students who got 'S' in more than 2 courses during single enrollment.**

```
Select * FROM Student as S WHERE S.Id IN (SELECT E.Id FROM Enroll as E
WHERE E.grade = 'S' GROUP BY E.Id HAVING count(E.grade) > 2);
```

e.) Create a view that will keep track of the roll number, name and number of courses, a student has completed successfully.

Create view Student_Data as SELECT E.Id, S.name, count(E.Ccode) FROM Student as S, Enroll as E WHERE E.Id = S.Id AND E.grade <>'U' GROUP BY E.Id, S.name;

Question 3.) Consider the following relations for an Order Processing Database application in a Company.

Customer (Customerno varchar2 (5), Cname varchar2 (50)); Implement check constraints to check Customerno starts with 'C'.

Cust_Order (Orderno varchar2(5), Odate Date, Customerno references Customer, Ord_amt number(8));

Implement check constraints to check Orderno starts with 'O'.
Ord_amt is derived attribute (default value is 0);

Item (Itemno varchar2 (5), Item_name varchar2 (30), unit_price number (5));
Implement check constraint to check Itemno starts with 'I'.

Order_item (Orderno references Cust_order, Itemno references item, qty number (3));

a.) **Develop DDL to implement above schema enforcing primary key, check constraints and foreign key constraints.**

```
create database order_process ;

CREATE TABLE Customer(

        Customerno varchar(5) PRIMARY KEY,

        Cname varchar(25),

   CHECK (Customerno like 'C%')

);

CREATE TABLE Cust_Order(

        Orderno varchar(5) PRIMARY KEY,

        Odate date,

        Customerno varchar(5),

        Ord_amt int,

         FOREIGN KEY (Customerno) REFERENCES Customer(Customerno),
   CHECK(Orderno LIKE 'O%')

);


CREATE TABLE Item(

        Itemno varchar(5) PRIMARY KEY,
            Item_name varchar(30),

            unit_price int,

    CHECK (Itemno LIKE 'I%')

);


CREATE TABLE Order_item(

            Orderno varchar(5) PRIMARY KEY,

            Itemno varchar(5),

            qty int,

            FOREIGN KEY (Orderno) REFERENCES Cust_Order(Orderno),
            FOREIGN KEY (Itemno) REFERENCES Item(Itemno)
);


INSERT INTO Customer VALUES('C0001','Sudhanshu pandey');
INSERT INTO Customer VALUES('C0003','ARUN SHARMA');
INSERT INTO Customer VALUES('C0005','suman YADAV');
INSERT INTO Customer VALUES('C0007','MANAS KUMAR');
INSERT INTO Customer VALUES('C0009','kishan TAILOR');


INSERT INTO Cust_Order values('O01', '2019-05-12', 'C0003',1180);
INSERT INTO Cust_Order values('O02', '2020-01-11', 'C0005',200);
INSERT INTO Cust_Order values('O03', '2019-12-29', 'C0001',900);
INSERT INTO Cust_Order values('O04', '2020-02-17', 'C0007',1200);
INSERT INTO Cust_Order values('O05', '2020-02-17', 'C0001',1200);
INSERT INTO Cust_Order values('O06', '2020-02-17', 'C0001',1200);
INSERT INTO Cust_Order values('O07', '2020-02-17', 'C0001',1200);


INSERT INTO Item values('I002',"FAN",100);

INSERT INTO Item values('I001',"Biscuit",2000);

INSERT INTO Item values('I003',"TABLE",100);

INSERT INTO Item values('I004',"COLE",50);

INSERT INTO Item values('I005',"CHAIR",200);
```

INSERT INTO Order_item VALUES('O01', 'I002', 4);

INSERT INTO Order_item VALUES('O02', 'I001', 3);

INSERT INTO Order_item VALUES('O03', 'I005', 2);

INSERT INTO Order_item VALUES('O04', 'I001', 5);

INSERT INTO Order_item VALUES('O05', 'I004', 5);

INSERT INTO Order_item VALUES('O06', 'I001', 6);

INSERT INTO Order_item VALUES('O07', 'I005', 5);

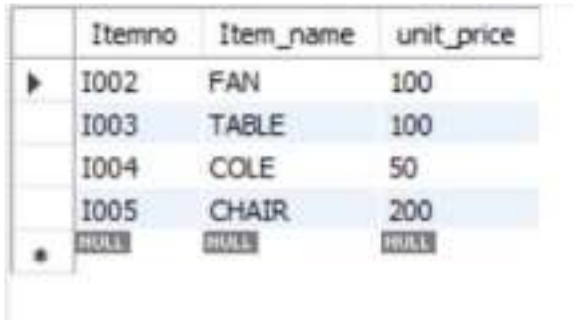
b.) **Develop SQL query to list the details of customers who have placed more than 3 orders.**

SELECT * FROM Customer as C WHERE C.Customerno IN (SELECT O.Customerno FROM

Cust_Order as O GROUP BY O.Customerno HAVING count(O.Orderno) > 3);

c.) **Develop a SQL query to list details of items whose price is less than the average price of all items in each order.**

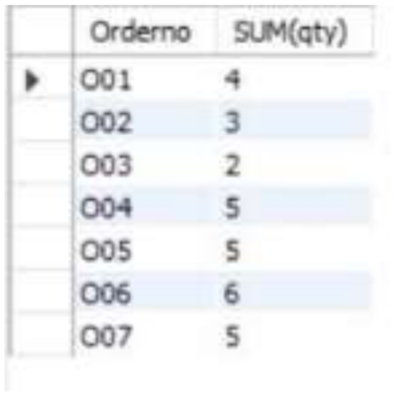
SELECT * FROM Item as I WHERE I.unit_price < (SELECT avg(unit_price) FROM Item);



	Itemno	Item_name	unit_price
▶	I002	FAN	100
	I003	TABLE	100
	I004	COLE	50
	I005	CHAIR	200
*	NULL	NULL	NULL

d.) **Develop a SQL query to list the orderno and number of items in each order.**

SELECT Orderno, SUM(qty) FROM Order_item GROUP BY Orderno;

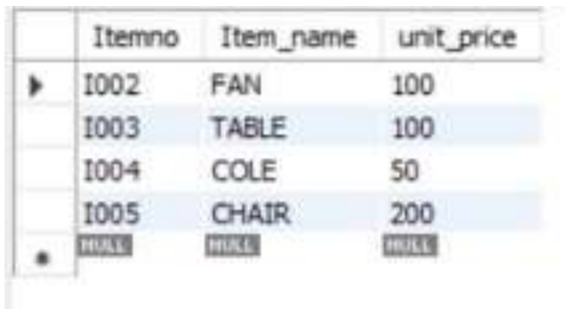


	Orderno	SUM(qty)
▶	O01	4
	O02	3
	O03	2
	O04	5
	O05	5
	O06	6
	O07	5

e.) **Develop a SQL query to list the details of items that are present in 25% of the orders.**

SELECT * FROM Item WHERE Itemno IN (SELECT Itemno FROM Order_item GROUP BY

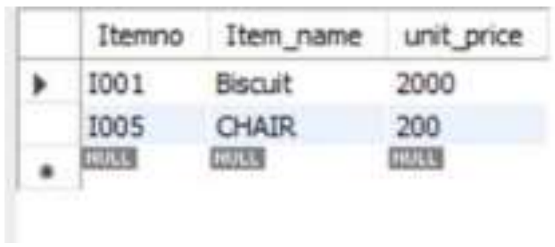
Itemno HAVING count(Itemno) >= (SELECT (count(*)/4) FROM Cust_Order));



	Itemno	Item_name	unit_price
▶	I002	FAN	100
	I003	TABLE	100
	I004	COLE	50
	I005	CHAIR	200
●	NULL	NULL	NULL

f.) **Develop an update statement to update the value of Ord_amt.**

UPDATE Cust_Order SET Ord_amt = (SELECT sum(O.qty * I.unit_price) FROM Order_item as O, Item as I WHERE Cust_Order.Orderno = O.Orderno AND O.Itemno= I.Itemno);



	Itemno	Item_name	unit_price
▶	I001	Biscuit	2000
	I005	CHAIR	200
●	NULL	NULL	NULL

g.) Create a view that keeps track of detail of each customer and number of Order placed.

CREATE VIEW CUSTOMER_DETAILS AS SELECT

C.Customerno,C.Cname,count(Orderno) as Order_C from Customer as C,Cust_Order as O

```
                    where C.Customerno=O.Customerno group by
C.Customerno,C.Cname;

select * from CUSTOMER_DETAILS;
```

Question 4.) Create the relation employee(eid integer, managerid integer) where managereid is the foreign key referencing to the employee. Develop DDL to implement above schema enforcing primary key as eid.

```
create database office;

create table employee(

          eid integer primary key ,

    managerid integer ,

    foreign key employee(managerid) references employee (eid) on delete cascade

);
```

Insert some data to the employee and run a delete query. insert into employee values (1,1);

```
insert into employee values (2,1);

insert into employee values (3,2);

insert into employee values (4,3);

insert into employee values (5,5);

insert into employee values (6,5);

insert into employee values (7,5);

insert into employee values (8,5);

insert into employee values (9,6);

insert into employee values (10,7);

select * from employee;
```

Now use on delete cascade and again run delete query.

```
delete from employee where eid = 1;
select * from employee;
```