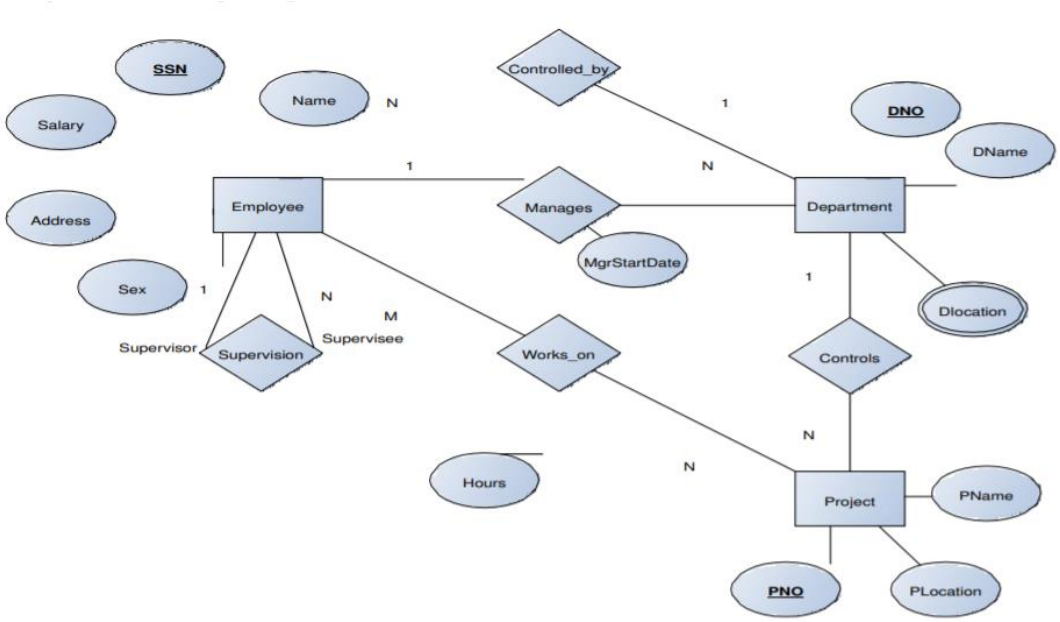
LAB PROGRAM 4

4. Consider the schema for CompanyDatabase:

EMPLOYEE (SSN, Name, Address, Sex, Salary, DNo)
DEPARTMENT (DNo, DName, MgrSSN, MgrStartDate)
DLOCATION (DNo,DLoc)
PROJECT (PNo, PName, PLocation, DNo)
WORKS_ON (SSN, PNo, Hours)

Write the ER diagram and SQL queries to

1. **Display the employee details whose salary is greater than 5 lakh , sorting the records in descending order of SSN.**
2. **Display the number of employees along with project names working on each project.**
3. **Show the resulting salaries if every employee working on the 'IOT' project is given a 10 percent raise.**
4. **Find the sum of the salaries of all employees of the 'Dept2' department, as well as the maximum salary, the minimum salary, and the average salary in this department**
5. **For each department that has more than two employees, retrieve the department number and the number of its employees who are making more than Rs. 6,00,000.**



CREATE TABLE DEPARTMENT
(DNO VARCHAR (20),
DNAME VARCHAR (20),
MGRSTARTDATE DATE,

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```
Primary Key (DNO));

CREATE TABLE EMPLOYEE
(SSN VARCHAR (20) PRIMARY KEY,
FNAME VARCHAR(20),
LNAME VARCHAR(20),
ADDRESS VARCHAR (20),
SEX CHAR (1),
SALARY INTEGER,
DNO varchar(20),
FOREIGN KEY (DNO) REFERENCES DEPARTMENT (DNO) ON DELETE SET NULL);

ALTER TABLE DEPARTMENT
ADD MGRSSN VARCHAR(10) REFERENCES EMPLOYEE (SSN);



CREATE TABLE DLOCATION
(DLOC VARCHAR (20),
DNO varchar(20),
FOREIGN KEY (DNO) REFERENCES DEPARTMENT (DNO),
PRIMARY KEY (DNO, DLOC));

  CREATE TABLE PROJECT (
PNO INTEGER PRIMARY KEY,
PNAME VARCHAR(20),
PLOCATION VARCHAR (20),
DNO varchar(20),
FOREIGN KEY (DNO) REFERENCES DEPARTMENT (DNO));

CREATE TABLE WORKS_ON
(HOURS INT (4),
PNO integer,
SSN  Varchar(20),
FOREIGN KEY (SSN) REFERENCES EMPLOYEE (SSN),
FOREIGN KEY (PNO) REFERENCES PROJECT(PNO),
PRIMARY KEY (SSN, PNO));
```

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```
INSERT INTO DEPARTMENT VALUES ('D01','Dept1','2015-06-01','EA01');
INSERT INTO DEPARTMENT VALUES ('D02','Dept2','2017-05-02','EA02');
INSERT INTO DEPARTMENT VALUES ('D03','Dept3','2016-06-01','EA03');
INSERT INTO DEPARTMENT VALUES ('D04','Dept4','2015-08-01','EA04');
INSERT INTO DEPARTMENT VALUES ('D02','Dept2','2017-05-02','EA05');
```

```
INSERT INTO EMPLOYEE (SSN, FNAME, LNAME, ADDRESS, SEX, SALARY,DNO)
VALUES
('EA01','JOHN','SCOTT','BANGALORE','M', 450000,'D01');
INSERT INTO EMPLOYEE (SSN, FNAME, LNAME, ADDRESS, SEX, SALARY,DNO)
VALUES
('EA02','JAMES','SMITH','BANGALORE','M', 500000,'D02');
INSERT INTO EMPLOYEE (SSN, FNAME, LNAME, ADDRESS, SEX, SALARY,DNO)
VALUES
('EA03','HEARN','BAKER','BANGALORE','M', 700000,'D03');
INSERT INTO EMPLOYEE (SSN, FNAME, LNAME, ADDRESS, SEX, SALARY,DNO)
VALUES
('EA04','EDWARD','SCOTT','MYSORE','M', 500000,'D04');
INSERT INTO EMPLOYEE (SSN, FNAME, LNAME, ADDRESS, SEX, SALARY,DNO)
VALUES
('EA05','PAVAN','HEGDE','MANGALORE','M', 650000,'D01');
INSERT INTO EMPLOYEE (SSN, FNAME, LNAME, ADDRESS, SEX, SALARY,DNO)
VALUES
('EA06','GIRISH','Shetty','MYSORE','M', 450000,'D02');
INSERT INTO EMPLOYEE (SSN, FNAME, LNAME, ADDRESS, SEX, SALARY,DNO)
VALUES
('EA07','NEHA','SN','BANGALORE','F', 800000,'D02');
INSERT INTO EMPLOYEE (SSN, FNAME, LNAME, ADDRESS, SEX, SALARY,DNO)
VALUES
('EA08','AMULYA','K','MANGALORE','F', 350000,'D04');
```

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```
INSERT INTO DLOCATION VALUES ('BANGALORE', 'D01');
INSERT INTO DLOCATION VALUES ('BANGALORE', 'D02');
INSERT INTO DLOCATION VALUES ('MANGALORE', 'D03');
INSERT INTO DLOCATION VALUES('Mysore','D04');


INSERT INTO PROJECT VALUES (100,'IOT','BANGALORE','D01');
INSERT INTO PROJECT VALUES (101,'CLOUD','BANGALORE','D02');
INSERT INTO PROJECT VALUES (102,'BIGDATA','MANGALORE','D03');
INSERT INTO PROJECT VALUES (103,'SENSORS','MANGALORE','D03');
INSERT INTO PROJECT VALUES (104,'Machine learning','Mysore','D04');
INSERT INTO PROJECT VALUES (105,'Networks','Mysore','D04');



INSERT INTO WORKS_ON VALUES (4, '100','EA01');
INSERT INTO WORKS_ON VALUES (6, 101,'EA01');
INSERT INTO WORKS_ON VALUES (8, 102,'EA02');
INSERT INTO WORKS_ON VALUES (10,100, 'EA02');
INSERT INTO WORKS_ON VALUES (3, 100,'EA03');
INSERT INTO WORKS_ON VALUES (4, 101,'EA04');
INSERT INTO WORKS_ON VALUES (5, 102,'EA05');
INSERT INTO WORKS_ON VALUES (6, 103,'EA06');
INSERT INTO WORKS_ON VALUES (7, 104,'EA07');
INSERT INTO WORKS_ON VALUES (5, 105,'EA08');
```

6. **Display the employee details whose salary is greater than 5 lakh , sorting the records in descending order of SSN.**

   Select * from Employee where salary > 500000 order by SSN DESC;

	SSN	FNAME	LNAME	ADDRESS	SEX	SALARY	DNO
▶	EA07	NEHA	SN	BANGALORE	F	800000	D02
	EA05	PAVAN	HEGDE	MANGALORE	M	650000	D01
	EA03	HEARN	BAKER	BANGALORE	M	700000	D03
*	NULL	NULL	NULL	NULL	NULL	NULL	NULL

7. **Display the number of employees along with project name working on each project.**

```
SELECT count(*), P.Pname
FROM EMPLOYEE E, WORKS_ON W, PROJECT P
WHERE E.SSN=W.SSN
AND W.PNO=P.PNO
group by Pname;
```

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count(*)	Pname
3	IOT
2	CLOUD
2	BIGDATA
1	SENSORS
1	Machine learning
1	Networks

8. **Show the resulting salaries if every employee working on the 'IOT' project is given a10 percent raise.**

```
SELECT E.FNAME, E.LNAME, 1.1*E.SALARY AS INCR_SAL FROM
EMPLOYEE E, WORKS_ON W, PROJECT P
WHERE E.SSN=W.SSN
AND W.PNO=P.PNO
AND P.PNAME='IOT';
```

FNAME	LNAME	INCR_SAL
JOHN	SCOTT	495000.0
JAMES	SMITH	550000.0
HEARN	BAKER	770000.0
JOHN	SCOTT	495000.0
EDWARD	SCOTT	550000.0
JAMES	SMITH	550000.0
PAVAN	HEGDE	715000.0
GIRISH	Shetty	495000.0
NEHA	SN	880000.0
AMULYA	K	385000.0

9. **Find the sum of the salaries of all employees of the 'Dept2' department, as well as the maximum salary, the minimum salary, and the average salary in this department**

```
SELECT SUM(E.SALARY), MAX(E.SALARY), MIN(E.SALARY),
AVG(E.SALARY)
FROM EMPLOYEE E, DEPARTMENT D
WHERE E.DNO=D.DNO
AND D.DNAME='Dept2';
```

SUM(E.SALARY)	MAX(E.SALARY)	MIN(E.SALARY)	AVG(E.SALARY)
1750000	800000	450000	583333.3333

10. **For each department that has more than two employees, retrieve the department number and the number of its employees who are making more than Rs. 6,00,000.**

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```
SELECT D.DNO, COUNT(*)
FROM DEPARTMENT D, EMPLOYEE E
WHERE D.DNO=E.DNO
AND E.SALARY>600000
AND D.DNO IN (SELECT E1.DNO
FROM EMPLOYEE E1 GROUP
BY E1.DNO HAVING COUNT(*)>2)
GROUP BY D.DNO
```

	DNO	COUNT(*)
▶	D02	1

5. Consider the schema for College Database:

STUDENT (USN, SName, Address, Phone, Gender)
SEMSEC (SSID, Sem, Sec)
CLASS (USN, SSID)
SUBJECT (Subcode, Title, Sem, Credits)
IAMARKS (USN, Subcode, SSID, Test1, Test2, Test3, FinalIA)

Write the ER diagram and SQL queries to

1. List all the student details studying in eight semester 'A' section.

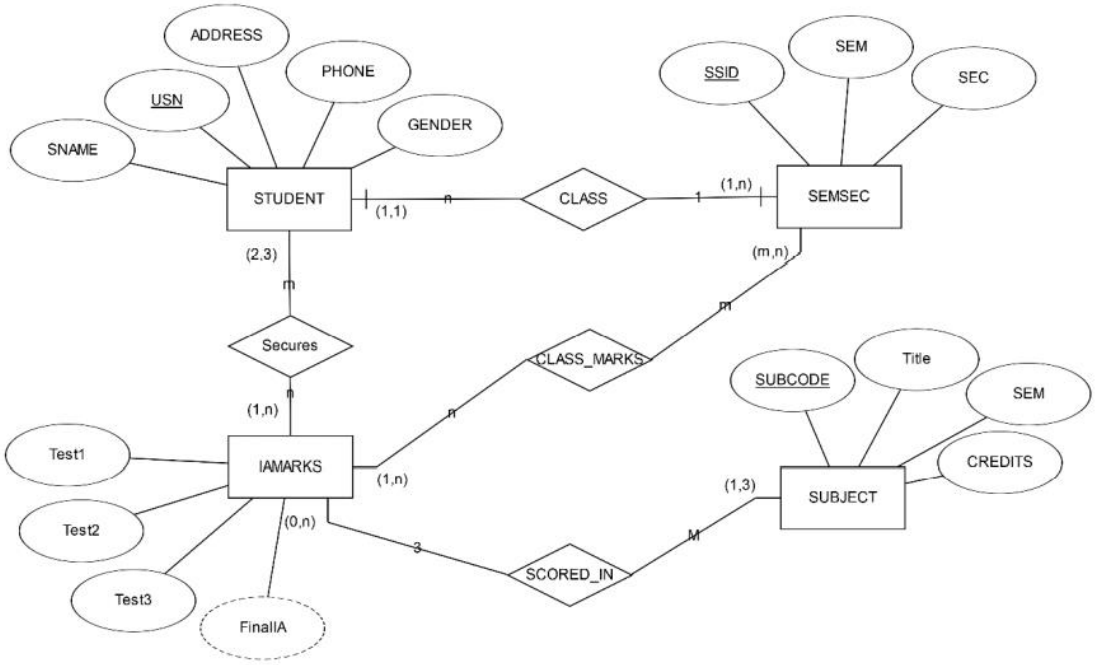
2. Compute the total number of male and female students in each semester and in each section.

3. Create a view of subject codes and names of 8^{th} semester.

4. Create a trigger to calculate the average of three test marks before insertion of the data in database.

5. Create a stored procedure to find the students list who has scored highest IA marks in each subject.

Entity - Relationship Diagram



CREATE TABLE STUDENT
(USN VARCHAR (10) PRIMARY KEY,
SNAME VARCHAR (25),
ADDRESS VARCHAR (25),
PHONE NUMBER (10),
GENDER CHAR (1));

CREATE TABLE SEMSEC
(SSID VARCHAR (5) PRIMARY KEY,
SEM NUMBER (2),
SEC CHAR (1));

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

CREATE TABLE SUBJECT
(SUBCODE VARCHAR (8),
TITLE VARCHAR (20),
SEM NUMBER (2),
CREDITS NUMBER (2),
PRIMARY KEY (SUBCODE));

```
CREATE TABLE IAMARKS
(USN VARCHAR (10),
SUBCODE VARCHAR (8),
 SSID VARCHAR (5),
 TEST1 NUMERIC(2),
TEST2 NUMERIC (2),
TEST3 NUMERIC (2),
FINALIA NUMBER (2),
PRIMARY KEY (USN, SUBCODE, SSID),
FOREIGN KEY (USN) REFERENCES STUDENT (USN),
FOREIGN KEY (SUBCODE) REFERENCES SUBJECT (SUBCODE),
 FOREIGN KEY (SSID) REFERENCES SEMSEC (SSID));



INSERT INTO STUDENT VALUES ('1AB13CS020','AKSHAY','BELAGAVI',
8877881122,'M');
INSERT INTO STUDENT VALUES ('1AB13CS022','SANDHYA','BENGALURU',
7722829912,'F');
INSERT INTO STUDENT VALUES ('1AB13CS024','TEESHA','BENGALURU',
7712312312,'F');
INSERT INTO STUDENT VALUES ('1AB13CS026','SUPRIYA','MANGALURU',
8877881122,'F');
INSERT INTO STUDENTVALUES ('1AB14CS040','ABHAY','BENGALURU',
9900211201,'M');
INSERT INTO STUDENT VALUES ('1AB14CS042','BHASKAR','BENGALURU',
9923211099,'M');
INSERT INTO STUDENTVALUES ('1AB14CS044','ASMI','BENGALURU',
7894737377,'F');
 INSERT INTO STUDENT VALUES ('1AB15CS050','AJAY','TUMKUR', 9845091341,'M');


INSERT INTO SEMSEC VALUES ('CSE8A', 8,'A');
INSERT INTO SEMSEC VALUES (‘CSE8B', 8,'B');
INSERT INTO SEMSEC VALUES ('CSE6A', 6, ‘A’);
INSERT INTO SEMSEC VALUES (‘CSE6B’ , 6, ‘B’);
INSERT INTO SEMSEC VALUES (‘CSE4A', 4,'A');



INSERT INTO CLASS VALUES (‘1AB13CS020’,‘CSE8A’);
INSERT INTO CLASS VALUES (‘1AB13CS022’,‘CSE8A’);
INSERT INTO CLASS VALUES (‘1AB13CS024’,‘CSE8B’);
INSERT INTO CLASS VALUES (‘1AB13CS026’,‘CSE8B’);
 INSERT INTO CLASS VALUES (‘1AB14CS040’,‘CSE6A’);
 INSERT INTO CLASS VALUES (‘1AB14CS042’,‘CSE6A’);
```

```
INSERT INTO CLASS VALUES (‘1AB14CS044’,‘CSE6B’);
INSERT INTO CLASS VALUES (‘1AB15CS050’,‘CSE4A’);


INSERT INTO SUBJECT VALUES ('10CS81','ACA', 8, 4);
INSERT INTO SUBJECT VALUES ('10CS82','SSM', 8, 4);
INSERT INTO SUBJECT VALUES ('10CS83','NM', 8, 4);
INSERT INTO SUBJECT VALUES ('10CS61','OOAD', 6, 4);
INSERT INTO SUBJECT VALUES ('10CS62','ECS', 6,4);
INSERT INTO SUBJECT VALUES ('10CS63','PTW', 6, 4);
INSERT INTO SUBJECT VALUES ('15CS31', 'ME', 4, 4);
INSERT INTO SUBJECT VALUES ('15CS32','CN', 4, 4);
INSERT INTO SUBJECT VALUES ('15CS33','DBMS', 4, 4);
```

Queries:

1. List all the student details studying in eigth semester ‘A’ section.

Sol:

```
select s.usn, sname, address, phone, gender
from student s, class c, semsec ss
where sem=8 and sec='A' and ss.ssid=c.ssid and c.usn=s.usn;
```

output:

usn	sname	address	phone	gender
1AB13CS020	AKSHAY	BELAGAVI	8877881122	M
1AB13CS022	SANDHYA	BENGALURU	7722829912	F

2. Compute the total number of male and female students in each semester and in each section.

Sol:

```
select sem, sec, gender, count(*)
from student s, semsec ss,class c
where s.usn=c.usn and c.ssid=ss.ssid
```

```
group by sem, sec, gender
 order by sem;
```

Output:

sem	sec	gender	count(*)
6	A	M	2
6	B	F	1
8	A	F	1
8	A	M	1
8	B	F	1

3. Create a view of subject codes and names of 8th semester.

Sol:

```
CREATE VIEW CourseCode AS
SELECT SUBCODE,TITle
FROM SUBJECT
WHERE Sem='8';

Select * from CourseCode;
```

Output:

SUBCODE	TITle
10CS81	ACA
10CS82	SSM
10CS83	NM

4. Create a trigger to calculate the average of three test marks before insertion of the data in database.

Sol:

```
create trigger stud_marks
before INSERT
on
IAMARKS
for each row
set new.finalIA = (new.TEST1 + new.test2 + new.test3)/3;


INSERT INTO IAMARKS VALUES ('1AB13CS020','10CS81','CSE8A', 15, 16, 18,0);
INSERT INTO IAMARKS VALUES ('1AB13CS024','10CS81','CSE8A', 09, 08, 10,0);
INSERT INTO IAMARKS VALUES ('1AB13CS022','10CS82','CSE8A', 11, 12, 18,0);
INSERT INTO IAMARKS VALUES ('1AB13CS022','10CS82','CSE8B', 12, 19, 14,0);
INSERT INTO IAMARKS  VALUES ('1AB14CS040','10CS61','CSE6A', 19, 15, 20,0);
```

```
INSERT INTO IAMARKS  VALUES ('1AB14CS042','10CS61','CSE6A', 19, 10, 20,0);
INSERT INTO IAMARKS  VALUES ('1AB14CS042','10CS62','CSE6B', 20, 16, 19,0);
INSERT INTO IAMARKS  VALUES ('1AB14CS044','10CS62','CSE6B', 10, 11, 19,0);

select * from IAMarks;
```

Output:

USN	SUBCODE	SSID	TEST1	TEST2	TEST3	FINALIA
1AB13CS020	10CS81	CSE8A	15	16	18	16
1AB13CS022	10CS82	CSE8B	12	19	14	15
1AB14CS040	10CS61	CSE6A	19	15	20	18
1AB14CS042	10CS62	CSE6B	20	16	19	18
1AB15CS050	15CS31	CSE4A	15	15	12	14

5. Create a stored procedure to find the students list who has scored highest IA marks in each subject

Solution:

```
DELIMITER //
CREATE PROCEDURE FindHighestIAMarksInSub()
BEGIN
   SELECT subcode, USN, MAX(finalIA) AS highest_ia_marks
   FROM IAMarks
   GROUP BY subcode;
END //
DELIMITER ;
```

/*Execute the procedure*/

```
call FindHighestIAMarksInSub()
```

Output:

subcode	USN	highest_ja_marks
10CS61	1AB14CS040	16
10CS62	1AB14CS042	13
10CS81	1AB13CS020	9
10CS82	1AB13CS022	14