



DATABASE MANAGEMENT SYSTEMS LABORATORY

(Effective from the Academic Year 2023 - 2024)

V SEMESTER

Course Code	21CSL55	CIA Marks	50
Number of Contact Hours/Week (L: T: P: S)	0:0:2:0	SEE Marks	50
Total Hours of Pedagogy	20P	Exam Hours	03

EXPERIMENT SOLUTION

Consider the schema for Company Database:

EMPLOYEE (Eid, Name, Address, Gender, Salary, SuperEid, Dno)

DEPARTMENT (Dnum, Dname, DMgr_id, Mgr_start_date)

DLOCATION (Dno, Dlocation)

PROJECT (Pnum, Pname, Plocation, Dno)

WORKS_ON (Eid, Pno, Hours)

DEPENDENT (Empid, Dep_name, Gender, Bdate, Relationship)

```
CREATE TABLE DEPARTMENT (  
DNO INT,  
DNAME VARCHAR (30),  
MGR_SSN VARCHAR (10),  
MGR_START_DATE DATE,  
PRIMARY KEY (DNO));
```

```
CREATE TABLE EMPLOYEE (  
SSN VARCHAR (10),  
NAME VARCHAR (20),  
ADDRESS VARCHAR (20),  
GENDER CHAR (6),  
SALARY DECIMAL (10, 3),  
SUPER_SSN VARCHAR (10),  
DNO INT,  
PRIMARY KEY (SSN),  
FOREIGN KEY (SUPER_SSN) REFERENCES EMPLOYEE (SSN)  
ON DELETE CASCADE,  
FOREIGN KEY (DNO) REFERENCES DEPARTMENT (DNO)  
ON DELETE CASCADE);
```

```
CREATE TABLE DLOCATION (  
DNO INT,  
DLOC VARCHAR (20),  
PRIMARY KEY (DNO, DLOC),  
FOREIGN KEY (DNO) REFERENCES DEPARTMENT (DNO)  
ON DELETE CASCADE);
```

```
CREATE TABLE PROJECT (  
PNO INT,  
PNAME VARCHAR (20),  
PLOCATION VARCHAR (20),  
DNO INT,  
PRIMARY KEY (PNO),
```



FOREIGN KEY (DNO) REFERENCES DEPARTMENT (DNO)
ON DELETE CASCADE);

CREATE TABLE **WORKS_ON** (
SSN VARCHAR (20),
PNO INT,
HOURS INT,
PRIMARY KEY (SSN, PNO),
FOREIGN KEY (SSN) REFERENCES EMPLOYEE (SSN)
ON DELETE CASCADE,
FOREIGN KEY (PNO) REFERENCES PROJECT (PNO)
ON DELETE CASCADE);

CREATE TABLE **DEPENDENT** (
SSN VARCHAR (20),
DEP_NAME VARCHAR(20),
GENDER CHAR(6),
BDATE DATE,
RELATIONSHIP CHAR(10),
PRIMARY KEY(SSN, DEP_NAME),
FOREIGN KEY(SSN) REFERENCES EMPLOYEE (SSN)
ON DELETE CASCADE
);

SQL> **ALTER TABLE DEPARTMENT**
ADD CONSTRAINT C_MSSN
FOREIGN KEY (MGR_SSN) REFERENCES EMPLOYEE
ON DELETE CASCADE;

Table altered.

Note: Insert Data to Department table with MGRSSN as NULL in the beginning. After Inserting Values to Employee table, update value of MGRSSN

SQL> INSERT INTO DEPARTMENT VALUES
('&DNO','&DNAME','&MGRSSN','&MGRSTARTDATE');

Enter value for dno: 1

Enter value for dname: ACCOUNTS

Enter value for mgrssn:

Enter value for mgrstartdate: 25-MAR-2018



SQL> SELECT * FROM DEPARTMENT;

DNO	DNAME	MGR_SSN	MGR_START
-----	-----	-----	-----
1	ACCOUNTS		25-MAR-18
2	DEVELOPER		25-JUL-17
3	ESTABLISHMENT		16-DEC-15
4	FINANCE		08-JAN-11
5	MAMNAGEMENT		11-NOV-09

Note: While Inserting first tuple for Employee table, set NULL value for SuperSSN. Later update it.

SQL> SELECT * FROM EMPLOYEE;

SSN	NAME	ADDRESS	GEN	SALARY	SUPER_SSN	DNO
-----	-----	-----	-----	-----	-----	-----
E1	SCOTT	SAN FRANSISCO	M	700000	E15	1
E2	ALBERT	SAN ANDREAS	M	800000	E1	1
E3	JULIET	ENGLAND	F	900000	E2	1
E4	ROBERT	NEW YORK	M	850000	E1	1
E5	BAIRSTOW	NEW ZEALAND	M	750000	E4	1
E6	SMITH	AUSTRALIA	M	800000	E4	1
E7	WARNER	TURKEY	M	500000	E3	2
E8	LUCY	AFRICA	F	400000	E6	3
E9	ROSE	NETHERLANDS	F	300000	E8	4
E10	ALIS	NEIGERIA	M	750000	E2	5
E11	JAMES	CHINA	M	900000	E8	5
E12	ANDERSON	KOREA	M	500000	E9	4
E13	DISHA	MUMBAI	F	400000	E12	3
E14	SARA	DELHI	F	250000	E14	4
E15	JOYCE	CALIFORNIA	M	60000	E13	5

SQL> UPDATE EMPLOYEE SET SUPER_SSN='E15' WHERE SSN='E1';



SQL> UPDATE DEPARTMENT SET MGR_SSN='E4' WHERE DNO='1';

SQL> UPDATE DEPARTMENT SET MGR_SSN='E2' WHERE DNO='2';

SQL> UPDATE DEPARTMENT SET MGR_SSN='E1' WHERE DNO='3';

SQL> UPDATE DEPARTMENT SET MGR_SSN='E5' WHERE DNO='4';

SQL> UPDATE DEPARTMENT SET MGR_SSN='E3' WHERE DNO='5';

SQL> SELECT * FROM DLOCATION;

DNO	DLOC
-----	-----
1	RUSSIA
2	CHINA
3	LOS VEGAS
4	MUMBAI
5	CALIFORNIA

SQL> SELECT * FROM PROJECT;

PNO	PNAME	PLOCATION	DNO
-----	-----	-----	-----
1	IOT	MUMBAI	1
2	BANK SOFTWARE	BANGALORE	2
3	EMBEDDED SYSTEMS	HONG KONG	3
4	FOREST DEPARTMENT	DELHI	4
5	GOVERNMENT APP	GANDHINAGAR	5



SQL> SELECT * FROM WORKS_ON;

SSN	PNO	HOURS
-----	-----	-----
E1	1	8
E2	2	9
E3	3	6
E4	4	5
E5	5	10

Write SQL queries to

1. Make a list of all project numbers for projects that involve an employee whose name is “Rahul”, either as a worker or as a manager of the department that controls the project.

(SELECT DISTINCT P.PNO FROM PROJECT P, EMPLOYEE E, DEPARTMENT D WHERE E.SSN=D.MGR_SSN AND D.DNO=P.DNO AND E.NAME='RAHUL')

UNION

(SELECT DISTINCT P.PNO FROM PROJECT P, EMPLOYEE E, WORKS_ON W WHERE E.SSN=W.SSN AND P.PNO=W.PNO AND E.NAME='RAHUL');

2. Show the resulting salaries if every employee working on the “IoT” project is given a 10 percent raise.

SELECT E.NAME, 1.1*SALARY AS INCREASED_SALARY FROM EMPLOYEE E, PROJECT P, WORKS_ON W WHERE E.SSN=W.SSN AND P.PNO=W.PNO AND P.PNAME='IOT';

3. Find the sum of the salaries of all employees of the “Accounts” department, as well as the maximum salary, the minimum salary, and the average salary in this department.

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

4. Retrieve the name of each employee who works on all the projects controlled by department number 5 (use NOT EXISTS operator).

SELECT E.NAME FROM EMPLOYEE E WHERE NOT EXISTS

((SELECT P.PNO FROM PROJECT P WHERE P.DNO=5)

MINUS

(SELECT W.PNO FROM WORKS_ON W WHERE E.SSN=W.SSN));



5. Create a view Dept_info that gives details of department name, Number of employees and total salary of each department

COURSE OUTCOMES

Upon completion of this course, the students will be able to:

CO No.	Course Outcome Description	Bloom's Taxonomy Level
CO1	Use SQL programming and different concepts of DBMS to create, update and query on the Bank and Library databases.	CL3
CO2	Demonstrate SQL programming and different concepts of DBMS to create, update and query on the College database.	CL3
CO3	Illustrate the concepts of SQL programming and DBMS to create, update and query on the Company database.	CL3
CO4	Create, update and query on the Airline database by using different concepts of DBMS and SQL programming.	CL3
CO5	Design, implement and demonstrate a database application using front end tools and Compile the working with well document using modern tool.	CL6

CO-PO-PSO MAPPING

CO No.	Programme Outcomes (PO)												Programme Specific Outcome (PSO)	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	3	3	2	2			1				2		
CO2	3	3	3	2	2			1				2		
CO3	3	3	3	2	2			1				2		
CO4	3	3	3	2	2			1				2		
CO5	3	3	3	3	3	2		3	3	3	3	2		
3: Substantial (High)					2: Moderate (Medium)					1: Poor (Low)				