
DATABASE MANAGEMENT SYSTEMS

Labsheet – 8

Question 1

Create the following relations and write the given queries in SQL

Student (sID, sName, GPA)




College (collegeName , state, stud_count)

Apply (sID ,cName ,major, decision) - Decision can be Y/N

```
CREATE TABLE Students(SID INTEGER PRIMARY KEY,  
                        Sname VARCHAR(25),  
                        GPA NUMERIC(4, 2));  
  
CREATE TABLE College(Collegename VARCHAR(25) PRIMARY KEY,  
                       State VARCHAR(25),  
                       stud_count INTEGER);  
  
CREATE TABLE Apply(SID INTEGER,  
                    Cname VARCHAR(25),  
                    major VARCHAR(25),  
                    Decision CHAR(1),  
                    PRIMARY KEY(SID, Cname),  
                    FOREIGN KEY (SID) REFERENCES Students(SID),  
                    FOREIGN KEY (Cname) REFERENCES College(Collegename));
```

```
67 SELECT * FROM Students;
```

[Data Output](#)[Explain](#)[Messages](#)[Notifications](#)

| | sid [PK] integer  | sname character varying (25)  | gpa numeric (4,2)  |
|----|--|---|---|
| 1 | 1 | Alice J. | 3.80 |
| 2 | 2 | Bob S. | 3.50 |
| 3 | 3 | Charlie B. | 4.00 |
| 4 | 4 | Diana P. | 4.10 |
| 5 | 5 | Ethan H. | 4.20 |
| 6 | 6 | Fiona G. | 4.00 |
| 7 | 7 | George L. | 3.60 |
| 8 | 8 | Hannah M. | 3.90 |
| 9 | 9 | Ian M. | 3.70 |
| 10 | 10 | Jack S. | 2.50 |
| 11 | 11 | Lara C. | 3.20 |
| 12 | 12 | Marty M. | 3.80 |
| 13 | 13 | Nancy D. | 3.50 |
| 14 | 14 | Oliver T. | 3.70 |
| 15 | 15 | Peter P. | 3.90 |

```
68 SELECT * FROM College;
```

```
69
```

Data Output Explain Messages Notifications

| | collegename [PK] character varying (25) | state character varying (25) | stud_count integer |
|----|---|--|------------------------------|
| 1 | Stanford | CA | 7000 |
| 2 | Harvard | MA | 6000 |
| 3 | Columbia | NY | 8000 |
| 4 | Cal State | CA | 30000 |
| 5 | NYU | NY | 5000 |
| 6 | UCLA | CA | 45000 |
| 7 | UC Berkeley | CA | 35000 |
| 8 | SDSU | CA | 30000 |
| 9 | Princeton | NJ | 4000 |
| 10 | Small A | TX | 4000 |
| 11 | Tiny TI | FL | 3000 |
| 12 | Little S | OH | 2500 |

69 **SELECT** * **FROM** Apply;

Data Output Explain Messages Notifications

| | sid [PK] integer | cname [PK] character varying (25) | major character varying (25) | decision character (1) |
|----|---------------------|--------------------------------------|---------------------------------|---------------------------|
| 1 | 1 | Stanford | CS | Y |
| 2 | 1 | Cal State | Bio | Y |
| 3 | 2 | Harvard | Math | Y |
| 4 | 2 | Cal State | Chem | Y |
| 5 | 3 | Columbia | Phys | Y |
| 6 | 4 | Stanford | CS | Y |
| 7 | 5 | Stanford | Math | Y |
| 8 | 6 | Stanford | Phys | Y |
| 9 | 7 | NYU | CS | N |
| 10 | 8 | UCLA | CS | N |
| 11 | 9 | UC Berkeley | CS | N |
| 12 | 10 | Small A | Art | Y |
| 13 | 11 | Tiny TI | Eng | Y |
| 14 | 12 | Little S | Hist | N |
| 15 | 13 | UCLA | Psych | Y |
| 16 | 14 | Stanford | Lit | N |
| 17 | 15 | NYU | Film | Y |

1. Give Student ID, name, GPA and name of college and major where each student applied to.

```

71 -- Q1
72 SELECT A.SID, S.Sname, S.GPA, C.Collegename, A.major
73 FROM Apply A INNER JOIN Students S ON A.SID = S.SID
74 INNER JOIN College C ON A.Cname = C.Collegename;

```

Data Output Explain Messages Notifications

| | sid integer | sname character varying (25) | gpa numeric (4,2) | collegename character varying (25) | major character varying (25) |
|----|----------------|---------------------------------|----------------------|---------------------------------------|---------------------------------|
| 1 | 1 | Alice J. | 3.80 | Stanford | CS |
| 2 | 1 | Alice J. | 3.80 | Cal State | Bio |
| 3 | 2 | Bob S. | 3.50 | Harvard | Math |
| 4 | 2 | Bob S. | 3.50 | Cal State | Chem |
| 5 | 3 | Charlie B. | 4.00 | Columbia | Phys |
| 6 | 4 | Diana P. | 4.10 | Stanford | CS |
| 7 | 5 | Ethan H. | 4.20 | Stanford | Math |
| 8 | 6 | Fiona G. | 4.00 | Stanford | Phys |
| 9 | 7 | George L. | 3.60 | NYU | CS |
| 10 | 8 | Hannah M. | 3.90 | UCLA | CS |
| 11 | 9 | Ian M. | 3.70 | UC Berkeley | CS |
| 12 | 10 | Jack S. | 2.50 | Small A | Art |
| 13 | 11 | Lara C. | 3.20 | Tiny TI | Eng |
| 14 | 12 | Marty M. | 3.80 | Little S | Hist |
| 15 | 13 | Nancy D. | 3.50 | UCLA | Psych |
| 16 | 14 | Oliver T. | 3.70 | Stanford | Lit |
| 17 | 15 | Peter P. | 3.90 | NYU | Film |

2. Find details of applications who applied to California State.

```

76 -- Q2
77 SELECT A.SID, S.Sname, S.GPA, C.Collegename, A.major
78 FROM Apply A INNER JOIN Students S ON A.SID = S.SID
79 INNER JOIN College C ON A.Cname = C.Collegename
80 WHERE C.State = 'CA';

```

Data Output Explain Messages Notifications

| | sid integer | sname character varying (25) | gpa numeric (4,2) | collegename character varying (25) | major character varying (25) |
|----|----------------|---------------------------------|----------------------|---------------------------------------|---------------------------------|
| 1 | 1 | Alice J. | 3.80 | Stanford | CS |
| 2 | 1 | Alice J. | 3.80 | Cal State | Bio |
| 3 | 2 | Bob S. | 3.50 | Cal State | Chem |
| 4 | 4 | Diana P. | 4.10 | Stanford | CS |
| 5 | 5 | Ethan H. | 4.20 | Stanford | Math |
| 6 | 6 | Fiona G. | 4.00 | Stanford | Phys |
| 7 | 8 | Hannah M. | 3.90 | UCLA | CS |
| 8 | 9 | Ian M. | 3.70 | UC Berkeley | CS |
| 9 | 13 | Nancy D. | 3.50 | UCLA | Psych |
| 10 | 14 | Oliver T. | 3.70 | Stanford | Lit |

3. Find IDs, name, GPA of students and name of college with GPA > 4 applying to Stanford

```

82 -- Q3
83 SELECT A.SID, S.Sname, S.GPA, C.Collegename
84 FROM Apply A INNER JOIN Students S ON A.SID = S.SID
85 INNER JOIN College C ON A.Cname = C.Collegename
86 WHERE A.Cname = 'Stanford' AND S.GPA>4.0;

```

Data Output Explain Messages Notifications

| | sid integer | sname character varying (25) | gpa numeric (4,2) | collegename character varying (25) |
|---|----------------|---------------------------------|----------------------|---------------------------------------|
| 1 | 4 | Diana P. | 4.10 | Stanford |
| 2 | 5 | Ethan H. | 4.20 | Stanford |

4. Find details of Students who apply to CS major and their application are rejected .

```

88  -- Q4
89  SELECT A.SID, S.Sname, S.GPA, C.Collegename
90  FROM Apply A INNER JOIN Students S ON A.SID = S.SID
91  INNER JOIN College C ON A.Cname = C.Collegename
92  WHERE A.major = 'CS' AND A.Decision='N';

```

Data Output Explain Messages Notifications

| | sid integer | sname character varying (25) | gpa numeric (4,2) | collegename character varying (25) |
|---|----------------|---------------------------------|----------------------|---------------------------------------|
| 1 | 7 | George L. | 3.60 | NYU |
| 2 | 8 | Hannah M. | 3.90 | UCLA |
| 3 | 9 | Ian M. | 3.70 | UC Berkeley |

5. Find details of students who applied to colleges at New York

```

94  -- Q5
95  SELECT A.SID, S.Sname, S.GPA, C.Collegename, A.major
96  FROM Apply A INNER JOIN Students S ON A.SID = S.SID
97  INNER JOIN College C ON A.Cname = C.Collegename
98  WHERE C.State='NY';

```

Data Output Explain Messages Notifications

| | sid integer | sname character varying (25) | gpa numeric (4,2) | collegename character varying (25) | major character varying (25) |
|---|----------------|---------------------------------|----------------------|---------------------------------------|---------------------------------|
| 1 | 3 | Charlie B. | 4.00 | Columbia | Phys |
| 2 | 7 | George L. | 3.60 | NYU | CS |
| 3 | 15 | Peter P. | 3.90 | NYU | Film |

6. Find details of students who have not applied to any of college .

-- Q6: Find details of students who have not applied to any college.

SELECT S.SID, S.Sname, S.GPA

FROM Students S

WHERE S.SID NOT IN (SELECT A.SID FROM Apply A);

```
-----  
sid | sname | gpa  
-----+-----+-----  
(0 rows)
```

7. Find college where no student have applied .

-- Q7: Find college where no student has applied.

```
SELECT C.Collegename  
FROM College C  
WHERE C.Collegename NOT IN (SELECT A.Cname FROM Apply A);
```

```
collegename  
-----  
SDSU  
Princeton  
(2 rows)
```

8. Find sID who have only one application .

-- Q8: Find SID who have only one application.

```
SELECT A.SID  
FROM Apply A  
GROUP BY A.SID  
HAVING COUNT(A.SID) = 1;
```



```
sid
-----
11
9
15
3
5
4
10
6
14
13
7
12
8
(13 rows)
```

9. Find name and GPA of applicants who apply to any college where student count is not more than 5000.

Find name and GPA of applicants who apply to any college where student count is not more than 5000.

```
SELECT S.Sname, S.GPA
```

```
FROM Apply A
```

```
INNER JOIN Students S ON A.SID = S.SID
```

```
INNER JOIN College C ON A.Cname = C.Collegename
```

```
WHERE C.stud_count <= 5000;
```

| sname | | gpa |
|-----------|--|------|
| George L. | | 3.60 |
| Jack S. | | 2.50 |
| Lara C. | | 3.20 |
| Marty M. | | 3.80 |
| Peter P. | | 3.90 |

(5 rows)

10. Find various majors student applied in at college in state California.

-- Q10: Find various majors student applied in at colleges in state California.

```
SELECT DISTINCT A.major
```

```
FROM Apply A
```

```
INNER JOIN College C ON A.Cname = C.Collegename
```

```
WHERE C.state = 'CA';
```

| major |
|-------|
| Bio |
| Chem |
| CS |
| Lit |
| Math |
| Phys |
| Psych |

(7 rows)