

# 22AIE303 Labsheet 8

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**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 Student (  
    sID INT PRIMARY KEY,  
    sName VARCHAR(50),  
    GPA DECIMAL(3, 2)  
);  
CREATE TABLE College (  
    collegeName VARCHAR(100) PRIMARY KEY,  
    state VARCHAR(50),  
    stud_count INT  
);  
CREATE TABLE Apply (  
    sID INT,  
    cName VARCHAR(100),  
    major VARCHAR(50),  
    decision CHAR(1),  
    PRIMARY KEY (sID, cName, major),  
    FOREIGN KEY (sID) REFERENCES Student(sID),  
    FOREIGN KEY (cName) REFERENCES College(collegeName)  
);  
INSERT INTO Student (sID, sName, GPA) VALUES  
(1, 'Alice', 3.8),  
(2, 'Bob', 4.1),  
(3, 'Charlie', 3.6),  
(4, 'Diana', 4.5),  
(5, 'Eve', 2.9);  
  
INSERT INTO College (collegeName, state, stud_count) VALUES  
( 'Stanford', 'California', 16000),  
( 'MIT', 'Massachusetts', 11000),  
( 'NYU', 'New York', 21000),
```

```

('UC Berkeley', 'California', 25000),
('Princeton', 'New Jersey', 5000);
INSERT INTO Apply (sID, cName, major, decision) VALUES
(1, 'Stanford', 'CS', 'Y'),
(1, 'MIT', 'AI', 'N'),
(2, 'Stanford', 'CS', 'Y'),
(2, 'Princeton', 'Math', 'Y'),
(3, 'NYU', 'Physics', 'N'),
(4, 'UC Berkeley', 'CS', 'Y'),
(4, 'Stanford', 'AI', 'Y'),
(5, 'NYU', 'CS', 'N');

```

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

```

SELECT S.sID, S.sName, S.GPA, A.cName, A.major
FROM Student S
JOIN Apply A ON S.sID = A.sID;

```

sid	sname	gpa	cname	major
1	Alice	3.80	Stanford	CS
1	Alice	3.80	MIT	AI
2	Bob	4.10	Stanford	CS
2	Bob	4.10	Princeton	Math
3	Charlie	3.60	NYU	Physics
4	Diana	4.50	UC Berkeley	CS
4	Diana	4.50	Stanford	AI
5	Eve	2.90	NYU	CS

(8 rows)

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

```

SELECT A.*
FROM Apply A
JOIN College C ON A.cName = C.collegeName
WHERE C.state = 'California';

```

sid	cname	major	decision
1	Stanford	CS	Y
2	Stanford	CS	Y
4	UC Berkeley	CS	Y
4	Stanford	AI	Y

(4 rows)

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

```
SELECT S.sID, S.sName, S.GPA, A.cName
FROM Student S
JOIN Apply A ON S.sID = A.sID
WHERE S.GPA > 4 AND A.cName = 'Stanford';
```

```
sid | sname | gpa | cname
-----+-----+-----+-----
  2 | Bob   | 4.10 | Stanford
  4 | Diana | 4.50 | Stanford
(2 rows)
```

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

```
SELECT S.sID, S.sName, S.GPA, A.*
FROM Student S
JOIN Apply A ON S.sID = A.sID
WHERE A.major = 'CS' AND A.decision = 'N';
```

```
sid | sname | gpa | sid | cname | major | decision
-----+-----+-----+-----+-----+-----+-----
  5 | Eve   | 2.90 |  5 | NYU   | CS    | N
(1 row)
```

5. Find details of students who applied to colleges at New York  
6. Find details of students who have not applied to any of college .  
7. Find college where no student have applied .  
8. Find sID who have only one application .  
9. Find name and GPA of applicants who apply to any college where student count is not more than 5000.  
10. Find various majors student applied in at college in state California.

```
SELECT S.sID, S.sName, S.GPA, A.*
FROM Student S
JOIN Apply A ON S.sID = A.sID
JOIN College C ON A.cName = C.collegeName
WHERE C.state = 'New York';
```

```

sid | sname | gpa | sid | cname | major | decision
-----+-----+-----+-----+-----+-----+-----
  3 | Charlie | 3.60 |  3 | NYU   | Physics | N
  5 | Eve    | 2.90 |  5 | NYU   | CS      | N
(2 rows)

```

```

SELECT S.*
FROM Student S
LEFT JOIN Apply A ON S.sID = A.sID
WHERE A.sID IS NULL;

```

```

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

```

```

SELECT C.collegeName
FROM College C
LEFT JOIN Apply A ON C.collegeName = A.cName
WHERE A.cName IS NULL;

```

```

collegename
-----
(0 rows)

```

```

SELECT A.sID
FROM Apply A
GROUP BY A.sID
HAVING COUNT(*) = 1;

```

```

sid
----
  3
  5
(2 rows)

```

```

SELECT DISTINCT S.sName, S.GPA
FROM Student S
JOIN Apply A ON S.sID = A.sID
JOIN College C ON A.cName = C.collegeName
WHERE C.stud_count <= 5000;

```

```
sname | gpa
-----+-----
Bob   | 4.10
(1 row)
```

```
SELECT DISTINCT A.major
FROM Apply A
JOIN College C ON A.cName = C.collegeName
WHERE C.state = 'California';
```

```
major
-----
AI
CS
(2 rows)
```