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**Problem 1(15 Points)**: Consider relations R(A, B, C) with n tuples, and relation S(C,D,E) with m tuples. What arethe relation **schema** for T1 and T2

1. T1= R **X** S

    T1 = (A, B, R.C, S.C, D, E)

2. T2 = R ⋈ S

    T2 = (A, B, C, D, E)

**Problem2 (15 Points)**: Given the following NBA game relation Game(Home, Guest, Home_Score, Guest_Score)

| Home | Guest | Home_Score | Guest_Score |
|---|---|---|---|
| Lakers | Rockets | 110 | 96 |
| Magic | Thunder | 98 | 88 |
| Heat | Clippers | 89 | 99 |
| Bulls | Spurs | 87 | 89 |
| Warriors | Nets | 108 | 100 |

Write a SQL query to return all home teams that win the game.

SELECT
        Home,
        Home_Score AS WinningScore
FROM Game
WHERE Home_Score > Guest Score

**Problem3 (25 Points)**: Below is an employee relation, named Employees. The data type of IdNum and JobCode is int, and the data type of LName, FName, JobCode, Phone are varchar(100). Based on the employees relation, write **one** sql query to query tuples of employee with the following requirements

1) The query results should only contain attributes LName, FName, JobCode
2) LName and FName need to be renamed as Last_Name and First_Name respectively
3) The query should only return employees whose Phone contain '58

| IdNum | LName | FName | JobCode | Salary | Phone |
|---|---|---|---|---|---|
| 1876 | CHIN | JACK | TA1 | 42400 | 212/588-5634 |
| 1114 | GREENWALD | JANICE | ME3 | 38000 | 212/588-1092 |
| 1556 | PENNINGTON | MICHAEL | ME1 | 29860 | 718/383-5681 |
| 1354 | PARKER | MARY | FA3 | 65800 | 914/455-2337 |
| 1130 | WOOD | DEBORAH | PT2 | 36514 | 212/587-0013 |

SELECT
     LName AS Last_Name,
     FName AS First_Name,
     JobCode
FROM Employees
WHERE Phone = '%588%'

**Problem4 (25 Points)**: The table Scores(Team, Day, Opponent, Runs) gives the scores in the Baseball League for two consecutive days. The data in this table is as follows:

| Team | Day | Opponent | Runs |
|---|---|---|---|
| Dragons | Sunday | Swallows | 4 |
| Tigers | Sunday | Bay Stars | 9 |
| Carp | Sunday | Giants | 2 |
| Swallows | Sunday | Dragons | 7 |
| Bay Stars | Sunday | Tigers | 2 |
| Giants | Sunday | Carp | 4 |
| Dragons | Monday | Carp | 6 |
| Tigers | Monday | Bay Stars | 5 |
| Carp | Monday | Dragons | 3 |
| Swallows | Monday | Giants | 0 |
| Bay Stars | Monday | Tigers | 7 |
| Giants | Monday | Swallows | 5 |

Write an SQL query to find all teams that have more runs in Sunday than Monday.
SELECT
     s1.Team
     s1.Day,
     s1.Runs
FROM
     Scores s1,
     Scores s2
WHERE
     s1.Day = 'Sunday' AND
     s1.Runs > s2.Runs
GROUP BY
     s1.Team,
     s1.Day,
     s1.Runs

**Problem5 (20 Points)**: Given the following relations:

Students(sid, first_name, last_name, major, department)

Departments(id, name, college)

Note: department in Students is the department id, not name.

Write a SQL query using **IN** operator to find all students in the department of ECSSE and AE

```
SELECT
        (Students.first_name + ' ' + Students.last_name) AS Student,
        Students.major AS Major
FROM
        Students
WHERE Students.department IN (
        SELECT
                Id
        FROM
                Departments
        WHERE Departments.name IN ('ECSSE', 'AE')
)
```