Practice Sheet
Chapter 8 (MySQL)

Consider the following Relational Schema:

PLAYERS

Phone	Name	Position	Skill_Level	Team_Name

PLAYERS_INJURYRECORDS

Phone	InjuryRecords

TEAMS

Name	City	Coach	Captain_Phone

Host_Team	Guest_Team	Date	Host_Score	Guest_Scor
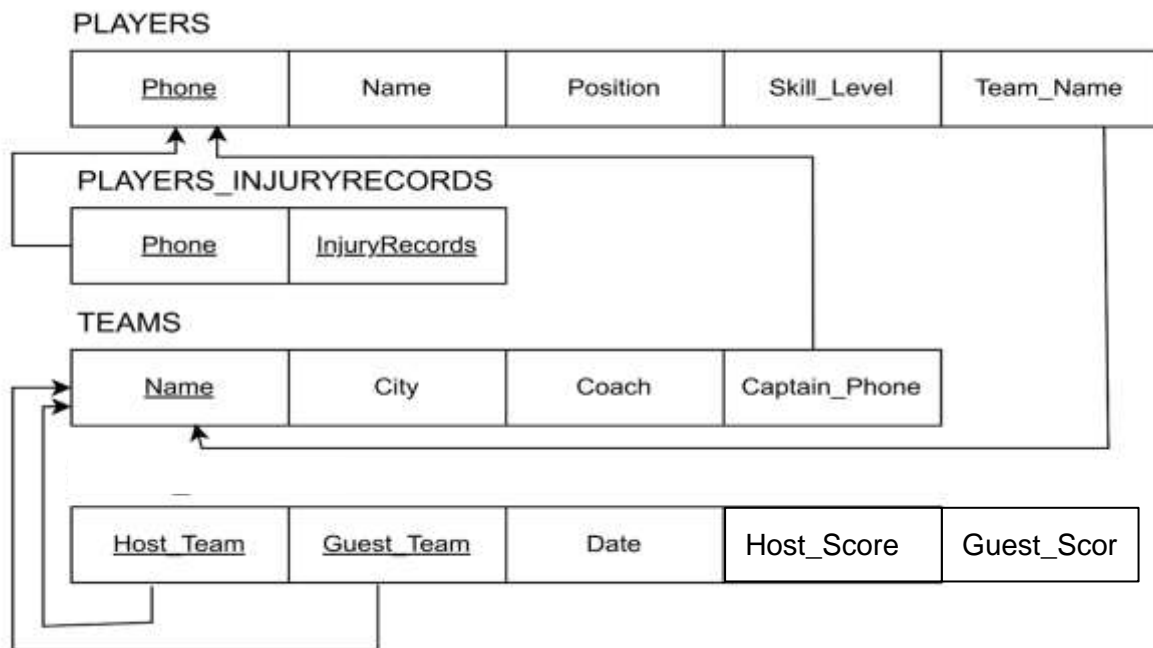
1. Write appropriate SQL queries for the following questions. For each question write a single query.

   a. Retrieve all information of all players where the team name has the term "City" in it or if the team name starts with an "A".
   b. Retrieve all information of the players who have the highest skill level.
   c. Retrieve all information of the players who have the highest skill level for each Team.
   d. Retrieve the average score of each host team. The average score should be printed as "host_average".
   e. Retrieve the list of cities all teams belong to. There should not be any duplicate cities in the output.
   f. Retrieve the number of teams in each city sorted by city in alphabetical order.
   g. Retrieve all game information where the guest team has a higher score than the host team in the year 2023.
   h. Retrieve the maximum score of each guest team if the team has played as guest at least 3 times. The maximum score should be printed as "guest_max".
   i. Retrieve the Game information of the last 10 games.
   j. Retrieve all game information for games played on the first recorded date. The information should be sorted by host team name.
   k. Retrieve the information of players who play in the "center forward" position and whose skill level is higher than every single player who plays in the "center back" position.

2. Write appropriate SQL queries for the following questions. For each question write a single query.

    a. Retrieve all information for each team and the captain's information of each team.
    b. Retrieve the host team - name, city, score, guest team - name, city, score and game date of all games held in 2022.
    c. Retrieve the Name, Position and Skill_Level of players who are members of a Host_Team and also have the highest skill level.
    d. Retrieve the Team Name, Captain Name, Phone and Captain's Injury Records of all Teams. The information should be sorted by the captain's phone in ascending order.

3. Verify whether the following query is correct.

```
SELECT staffNo, COUNT(salary)
FROM Staff;
```

4. The following query is to find the number of staff working in each branch and the sum of their salaries.

Verify whether the following query is correct. Is it required to include staffNo, salary and branchNo in GROUP BY?

```
SELECT branchNo, COUNT(staffNo) AS myCount, SUM(salary) AS mySum
FROM Staff
GROUP BY branchNo
ORDER BY branchNo;
```

5. The following query is to find the number of staff working in each branch office with more than one staff member, and the sum of their salaries.

Verify whether the following query is correct.

```
SELECT branchNo, COUNT(staffNo) AS myCount, SUM(salary) AS mySum
FROM Staff
GROUP BY branchNo
HAVING COUNT(staffNo) > 1
ORDER BY branchNo;
```

6. Verify whether the following query is correct.

```
SELECT staffNo, fName, lName, position, salary
FROM Staff
WHERE (SELECT AVG(salary) FROM Staff) < salary;
```

7. Verify whether the following query is correct.

```
SELECT name
FROM employees
WHERE id IN (
    SELECT manager_id
    FROM departments
    ORDER BY manager_id
);
```

Answer 1:

a. Select * from Players where Team_Name Like "%City%" or Team_Name like "A%";
b. Select * from Players where Skill_Level = (Select max(Skill_Level) from Players);
c. Select * from Players where (Team_Name, Skill_Level) in (Select Team_Name, max(Skill_Level) from Players group by Team_Name);
d. Select Host_Team, Avg(Score) As Host_Average from Games group by Host_Team;
e. Select Distinct City from Teams;
f. Select City, count(*) from Teams group by City Order by City;
g. Select * from Games where Guest_Score>Host_Score and Date Between "2023-01-01" and "2023-12-31"
h. Select Guest_Team, max(Guest_Score) from Games group by Guest_Team having count(*)>=3;
i. Select * from Games order by Date Desc Limit 10;
j. Select * from Games where Date = (Select min(Date) from Games) order by Host_Team;
k. Select * from Players where Position = "center forward" and Skill_level > all (Select Skill_Level from Players where Position = "center back");

Answer 2:

a. Select * from Teams T Inner Join Players P on T.Captain_Phone = P.Phone
b. Select Host_Team, T1.City, Host_score, Guest_Team, T2.City, Guest_Score, Date from (Teams T1 Inner Join Games G on T1.Name = G.Host_Team) Inner Join Team T2 on T2.Name = G.Guest_Team) where Date Between "2022-01-01" and "2022-12-31"
c. Select P.Name, Position, Skill_Level from Teams T, Players P, Games G where T.Name = P.Team_Name and T.Name = G.Host_Team and Skill_Level = (Select max(Skill_Level) from Players)
d. Select T.Name, P.Name, P.Phone, injuryRecords from (Teams T inner join Players P on T.captain_phone = P.Phone) inner Join Players_injuryRecords PI on PI.Phone = P.Phone order by P.Phone

Answer 3 :

Incorrect.

According to the SQL standard, if a SELECT statement includes an aggregate function (like COUNT(salary)) and there is no GROUP BY clause, then all columns in the SELECT list must be used only within aggregate functions.

In this query, COUNT(salary) is an aggregate function, which is valid. But staffNo is listed outside of any aggregate function, and there is no GROUP BY staffNo, which is invalid.

Here is the correct query.

```
SELECT staffNo, COUNT(salary)
FROM Staff
GROUP BY staffNo;
```

Answer 4 :

Correct.

According to the SQL standard, all column names in the SELECT list must appear in the GROUP BY clause unless the name is used only in an aggregate function. The contrary is not true: column names in the GROUP BY clause may not appear in the SELECT list.

In this query, branchNo is selected directly and must appear in the GROUP BY clause, which it does. staffNo and salary are used only inside aggregate functions, so they do not need to be in the GROUP BY clause.

Answer 5 :

Correct.

According to the SQL standard, any column referenced in the HAVING clause must either appear in the GROUP BY clause, or be used within an aggregate function (like SUM(), COUNT(), AVG(), MIN(), MAX()).

In the query, branchNo appears in the GROUP BY clause, COUNT(staffNo) is used within an aggregate function in the HAVING clause. Thus, the query follows SQL standards and correctly filters branches having more than one staff member.

Answer 6 :

Incorrect.

According to the SQL standard, when a subquery is one of the two operands involved in a comparison, the subquery must appear on the right-hand side of the comparison.

In the query, the subquery appears on the left-hand side of the comparison with salary.

Answer 7 :

Incorrect.

According to the SQL standard, the ORDER BY clause must not be used in a subquery.

Here, ORDER BY has been used in a subquery.

PRACTICE CHECKLIST:

SELECT
 *

 From
 Where - condition clause, row wise
 Or, And, Not/!
 Between
 Distinct
 Is, In
 Like, %, _
 Order By, Asc, Desc
 Limit
 Lower, Upper, Year functions
 Aggregate functions- min, max, sum, avg, count
 Group By
 Having - condition clause, group wise
 Subqueries/nested queries
 Any/All
 Joins (Inner)