University of Bahrain
Department of Information Technology

ITCS285

Tennis Tournament Database Management System

TERM PROJECT

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Problem description of the tennis tournament database management system:

The Tennis Association needs a database management system to streamline their operations andkeep track of various aspects related to tennis tournaments. The association organizes and manages multiple tournaments held in different countries, involving players from various nationalities. They require a comprehensive database solution to store and manage data regarding players, courts, referees, sponsors, tournaments, financial contributions, and match details.

The association wants to have a centralized system that allows them to easily access and update. information. They need to be able to add new players, including their personal details, rankings, practice time, experience years, and titles. Additionally, they want to store data about the tennis courts, including location, court number, and court type.

Referees play a crucial role in the tournaments, so the association wants to keep track of their information as well. This includes details such as the referee's name and years of experience. Sponsors are an essential part of the tournaments, and the association wants to record their names and types of sponsorship.

For each tournament, the association needs to store information such as the tournament name, start date, end date, country, and prize amount. They also want to track the financial contributions made by sponsors to each tournament.

Match details are critical to the association, as they need to maintain a record of the matches played in each tournament. This includes information about the match type, date, score, duration, players involved, loser, winner, the court where the match was played, and the referee overseeing the match.

The Tennis Association requires a database management system that allows them to efficiently manage and retrieve information about players, courts, referees, sponsors, tournaments, financial contributions, and match details. The system should support easy data entry, updating, and querying of the database, providing a comprehensive and accurate overview of the tennis tournaments organized by the association.

Requirements of the tennis tournament management system:

These requirements define the structure and relationships between the tables in the database. They allow for storing and retrieving information related to tennis players, courts, referees, sponsors, tournaments, financial contributions, and match details.

1. Player Table:

The Player table stores information about tennis players.

Each player has a unique ID, first name, middle name, surname, nationality, date of birth, player rank, practice time, experience years, and number of titles.

The ID column serves as the primary key for the table.

2. Court Table:

The Court table contains information about the tennis courts where matches are played.

Each court has a unique ID, location, court number, and court type.

The ID column serves as the primary key for the table.

3. Referee Table:

The Referee table holds information about the referees officiating the tennis matches.

Each referee has a unique ID, referee name, and experience years.

The ID column serves as the primary key for the table.

4. Sponsor Table:

The Sponsor table stores details about the sponsors supporting the tennis tournaments.

Each sponsor has a unique ID, sponsor name, and sponsor type.

The ID column serves as the primary key for the table.

5. Tournament Table:

The Tournament table represents the tennis tournaments being held.

Each tournament has a unique ID, tournament name, start date, end date, country, and prize amount.

The ID column serves as the primary key for the table.

The Prize column stores the prize amount in decimal format.

6. Funds Table:

The Funds table maintains information about the financial contributions made by sponsors to tournaments.

Each entry in the table corresponds to a specific sponsor and tournament combination.

The table has columns for the sponsor ID, tournament ID, and the contribution amount.

The Sponsor ID column references the ID column in the Sponsor table, and the TourID column references the ID column in the Tournament table.

7. Match Table:

The Match table contains details about the tennis matches played in the tournaments.

Each match has a unique ID, match type, match date, score, duration, player1 ID, player2 ID, loser ID, winner ID,tournament ID, court ID, and referee ID.

The ID column serves as the primary key for the table.

player1 ID, player2 ID, LoserID, and WinnerID columns reference the ID column in the Player

table.The TourID column references the ID column in the Tournament table.

The CourtID column references the ID column in the Court table.

The RefID column references the ID column in the Referee table.

Assumptions for the Tennis Tournament Management System database:

Unique Identifiers: Each entity (such as Player, Court, Referee, Sponsor, Tournament, and Match) has a unique identifier (ID) that serves as the primary key in their respective tables. These IDs are assumed to be auto incrementing and unique for each entry.

Data Validity: It is assumed that data entered the system is accurate and valid. Data validation techniques and input constraints should be implemented at the application level to ensure data integrity.

Player Rankings: Player rankings are assumed to be maintained and updated externally. The system does not provide functionality for automatic ranking updates based on match results. The player rank field in the Player table is primarily for informational purposes.

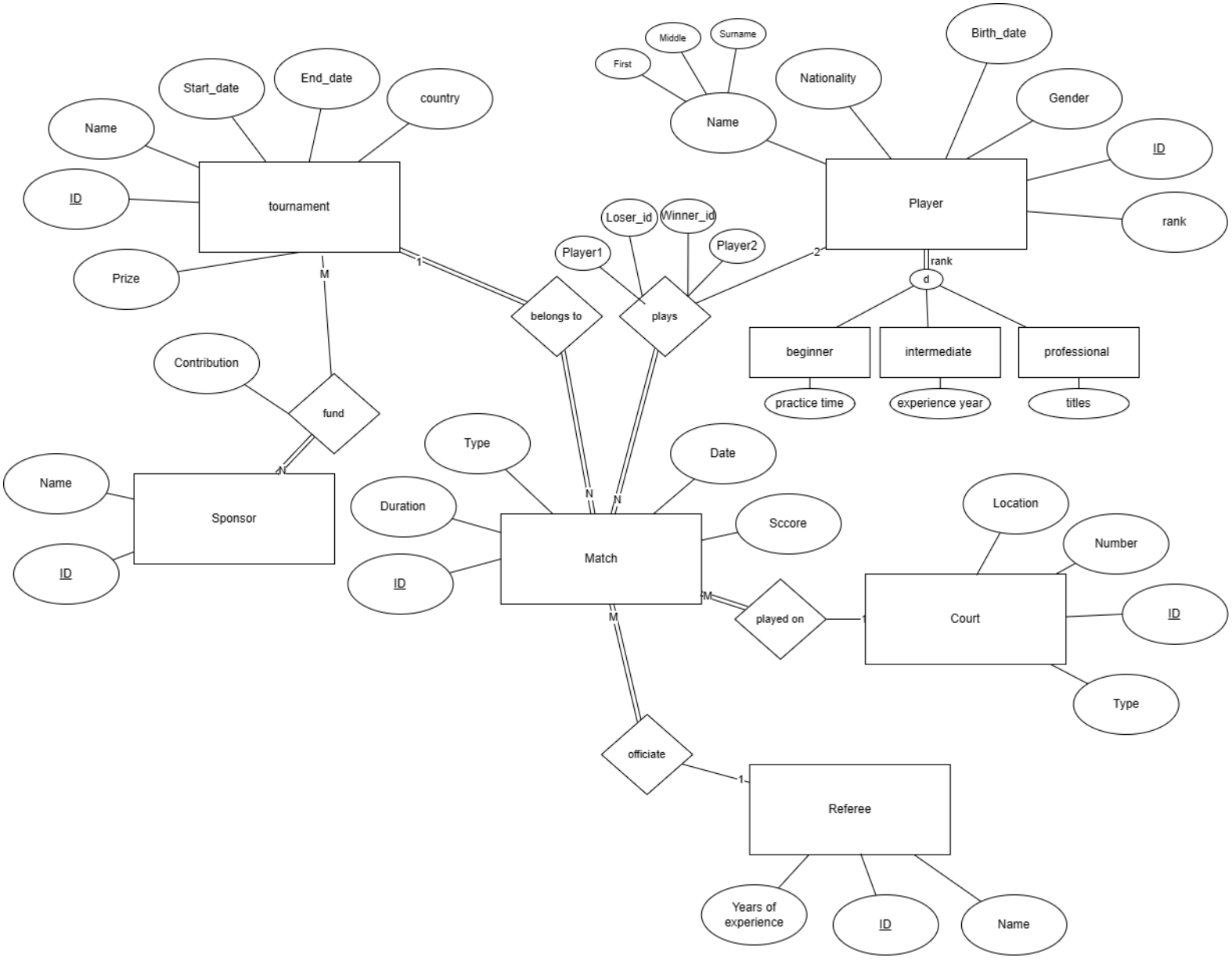
Match Winner: The system determines the tournament winner based on the number of wins of each player as the player with highest wins is considered the winner of the tournament and 2 players cannot have same number of wins.

Practice Time and Experience Years: The practice time and experience years fields in the Player table are assumed to be numerical values representing hours and years, respectively. It is assumed that these values are updated manually based on external information or player input.

Sponsorship Contributions: The contribution amount in the Funds table is assumed to be in a decimal format (e.g., 10,000.00) to represent monetary contributions made by sponsors to tournaments.

Time and Date Representation: The system assumes the usage of standard date and time formats for consistency and compatibility across different platforms and technologies. The date data type is assumed to be in the format 'YYYY-MM-DD', and the time data type is assumed to be in the format 'HH:MM:SS'.

ER DIAGRAM: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Referee
Years of experience
ID
Name

Entities:

Player (ID, FName, MidName, SurName, Nationality, BOD, Player_Rank, PracticeTime, ExperienceYears, Titles)

Court (ID, Location, court_num, court_type)

Referee (ID, ref_name, ExperienceYears)

Sponsor (ID, Spon_name, Spon_Type)

Tournament (ID, Tour_name, StartDate, EndDate, Country, Prize)

Funds (SponID, TourID, Contribution)

Match (ID, match_Type, match_date, Score, Duration, Player_1_ID, Player_2_ID, LoserID, WinnerID, TourID, CourtID, RefID)

Foreign Keys:

Funds table:

SponID (referring to Sponsor.ID)

TourID (referring to Tournament.ID)

Match table:

Player_1_ID (referring to Player.ID)

Player_2_ID (referring to Player.ID)

LoserID (referring to Player.ID)

WinnerID (referring to Player.ID)

TourID (referring to Tournament.ID)

CourtID (referring to Court.ID)

RefID (referring to Referee.ID)

Creating the tables schema:

```
-- Player table
CREATE TABLE Player (
  ID INT PRIMARY KEY,
  FName VARCHAR(50),
  MidName VARCHAR(50),
  SurName VARCHAR(50),
  Nationality VARCHAR(50),
  BOD DATE,
  Player_Rank VARCHAR(50),
  PracticeTime INT,
  ExperienceYears INT,
  Titles INT
);

-- Court table
CREATE TABLE Court (
  Location VARCHAR(100),
  court_num INT,
  court_type VARCHAR(50),
  ID INT PRIMARY KEY
);

-- Referee table
CREATE TABLE Referee (
  ID INT PRIMARY KEY,
  ref_name VARCHAR(100),
  ExperienceYears INT
);

-- Sponsor table
CREATE TABLE Sponsor (
  ID INT PRIMARY KEY,
  Spon_name VARCHAR(100),
  Spon_Type VARCHAR(50)
);

-- Tournament table
CREATE TABLE Tournament (
  ID INT PRIMARY KEY,
  Tour_name VARCHAR(100),
  StartDate DATE,
  EndDate DATE,
  Country VARCHAR(50),
  Prize DECIMAL(10,2)
);
```

```
-- Funds table
CREATE TABLE Funds (
  SponID INT,
  TourID INT,
  Contribution DECIMAL(10,2),
  FOREIGN KEY (SponID) REFERENCES Sponsor (ID),
  FOREIGN KEY (TourID) REFERENCES Tournament
(ID)
);

-- Match table
CREATE TABLE TMatch (
  ID INT PRIMARY KEY,
  match_Type VARCHAR(50),
  match_date DATE,
  Score VARCHAR(50),
  Duration TIME,
  Player_1_ID INT,
  Player_2_ID INT,
  LoserID INT,
  WinnerID INT,
  TourID INT,
  CourtID INT,
  RefID INT,
  FOREIGN KEY (Player_1_ID) REFERENCES Player
(ID),
  FOREIGN KEY (Player_2_ID) REFERENCES Player
(ID),
  FOREIGN KEY (LoserID) REFERENCES Player (ID),
  FOREIGN KEY (WinnerID) REFERENCES Player (ID),
  FOREIGN KEY (TourID) REFERENCES Tournament
(ID),
  FOREIGN KEY (CourtID) REFERENCES Court (ID),
  FOREIGN KEY (RefID) REFERENCES Referee (ID)
);
```

Inserting data into the tables:

```
-- Player table
INSERT INTO Player (ID, FName, MidName, SurName,
Nationality, BOD, Player_Rank, PracticeTime,
ExperienceYears, Titles)
VALUES
  (1, 'Mohammed', 'Ali', 'Abdullah', 'Saudi Arabia', '1990-05-12',
'Intermediate', 120, 6, 2),
  (2, 'Ahmed', 'Mahmoud', 'Ibrahim', 'Egypt', '1992-09-18',
'Advanced', 180, 8, 3),
  (3, 'Hassan', 'Khalid', 'Al-Masri', 'Jordan', '1988-07-22',
'Expert', 160, 10, 5),
  (4, 'Ali', 'Hassan', 'Rahim', 'Iraq', '1991-03-08', 'Intermediate',
140, 7, 1),
  (5, 'Khalid', 'Mohammed', 'Rashid', 'United Arab Emirates',
'1993-11-02', 'Master', 200, 12, 6),
  (6, 'Hussein', 'Kareem', 'Aziz', 'Lebanon', '1989-12-20',
'Intermediate', 130, 5, 2),
  (7, 'Yousef', 'Mustafa', 'Hammad', 'Palestine', '1994-06-15',
'Advanced', 190, 9, 4),
  (8, 'Nasser', 'Hassan', 'Rasheed', 'Oman', '1996-06-30',
'Intermediate', 120, 4, 1),
  (9, 'Khalid', 'Jaber', 'Ali', 'Bahrain', '1992-08-28', 'Master', 230,
11, 5),
  (10, 'Sami', 'Saleh', 'Hussein', 'Qatar', '1993-12-08', 'Expert',
170, 8, 3);

-- Court table
INSERT INTO Court (Location, court_num, court_type, ID)
VALUES
  ('Riyadh Sports Club', 1, 'Hard Court', 1),
  ('Cairo Tennis Club', 2, 'Clay Court', 2),
  ('Amman Tennis Center', 3, 'Grass Court', 3),
  ('Baghdad Tennis Club', 4, 'Hard Court', 4),
  ('Dubai Tennis Stadium', 5, 'Hard Court', 5),
  ('Beirut Sports City', 6, 'Clay Court', 6),
  ('Ramallah Tennis Club', 7, 'Hard Court', 7),
  ('Muscat Tennis Complex', 8, 'Grass Court', 8),
  ('Manama Tennis Club', 9, 'Hard Court', 9),
  ('Doha Tennis Academy', 10, 'Hard Court', 10);


-- Sponsor table
INSERT INTO Sponsor (ID, Spon_name, Spon_Type)
VALUES
  (1, 'ABC Company', 'Gold Sponsor'),
  (2, 'XYZ Corporation', 'Silver Sponsor'),
  (3, 'Middle East Bank', 'Bronze Sponsor'),
  (4, 'Gulf Airlines', 'Platinum Sponsor'),
  (5, 'Sports Equipment Ltd.', 'Silver Sponsor'),
  (6, 'Arab Telecom', 'Gold Sponsor'),
  (7, 'Tourism Board', 'Bronze Sponsor'),
  (8, 'Oil and Gas Company', 'Platinum Sponsor'),
  (9, 'Financial Services', 'Silver Sponsor'),
  (10, 'Hotel Group', 'Gold Sponsor');
```

```
-- Referee table
INSERT INTO Referee (ID, ref_name, ExperienceYears)
VALUES
  (1, 'John Smith', 5),
  (2, 'Maria Johnson', 4),
  (3, 'David Wilson', 7),
  (4, 'Jessica Davis', 6),
  (5, 'Michael Thompson', 3),
  (6, 'Jennifer Martinez', 8),
  (7, 'James Taylor', 2),
  (8, 'Linda Anderson', 5),
  (9, 'Robert Thomas', 6),
  (10, 'Karen Walker', 4);

-- Tournament table
INSERT INTO Tournament (ID, Tour_name, StartDate, EndDate,
Country, Prize)
VALUES
  (1, 'Middle East Open', '2023-07-01', '2023-07-10', 'United Arab
Emirates', 100000);

-- Funds table
INSERT INTO Funds (SponID, TourID, Contribution)
VALUES
  (1, 1, 50000),
  (2, 1, 30000),
  (3, 1, 20000),
  (4, 1, 40000),
  (5, 1, 25000),
  (6, 1, 35000),
  (7, 1, 15000),
  (8, 1, 45000),
  (9, 1, 28000),
  (10, 1, 32000);

INSERT INTO TMatch (ID, match_Type, match_date, Score,
Duration, Player_1_ID, Player_2_ID, LoserID, WinnerID, TourID,
CourtID, RefID)
VALUES
  (1, 'Final', '2023-07-10', '6-4, 7-5', '01:45:00', 1, 4, 2, 1, 2, 1, 1),
  (2, 'Final', '2023-07-10', '7-6, 6-4', '02:10:00', 2, 5, 3, 2, 1, 2, 2),
  (3, 'Final', '2023-07-10', '6-3, 7-5', '01:55:00', 3, 6, 4, 3, 3, 3, 3),
  (4, 'Final', '2023-07-10', '7-5, 6-4', '02:05:00', 4, 8, 5, 7, 1, 4, 4),
  (5, 'Final', '2023-07-10', '6-4, 6-3', '01:50:00', 2, 7, 6, 5, 2, 5, 5),
  (6, 'Final', '2023-07-10', '6-3, 7-6', '01:55:00', 6, 10, 7, 6, 1, 6, 6),
  (7, 'Final', '2023-07-10', '7-5, 6-2', '01:40:00', 7, 1, 8, 7, 3, 7, 7),
  (8, 'Final', '2023-07-10', '6-2, 6-3', '01:30:00', 1, 2, 9, 7, 1, 8, 8),
  (9, 'Final', '2023-07-10', '6-4, 6-2', '01:40:00', 9, 9, 10, 9, 2, 9, 9),
  (10, 'Final', '2023-07-10', '7-6, 6-4', '02:10:00', 10, 5, 1, 10, 1, 10,
10);
```

1- Find the total number of players in each tournament

Input

Run SQL

```
select Tour_name , count(distinct Player.ID) as Total_Players from player join tmatch, tournament where
Tournament.ID = TMatch.TourID and (TMatch.Player_1_ID = Player.ID or TMatch.Player_2_ID = Player.ID) group by
Tournament.ID
```

Output

Tour_name	Total_Players
Middle East Open	7
Asian Competition	5
Bahrain Competition	4

2- Get the sponsors and the amount they support within a specific tournament.

Input

Run SQL

```
SELECT Spon_name, SUM(Contribution) AS "Contribution Amount in Dinnars"
FROM Sponsor, Funds
WHERE
Sponsor.ID = Funds.SponID AND TourID = 1
GROUP BY Spon_name;
```

Output

Spon_name	Contribution Amount in Dinnars
ABC Company	50000
Arab Telecom	35000
Financial Services	28000
Gulf Airlines	40000
Hotel Group	32000
Middle East Bank	20000
Oil and Gas Company	45000
Sports Equipment Ltd.	25000
Tourism Board	15000
XYZ Corporation	30000

3- Select the referees played in a specific tournament Select the player with most titles and show their Nationality

Input

Run SQL

```
SELECT ref_name AS Referee, ExperienceYears AS "Years of Experience"
FROM Referee, TMatch
WHERE Referee.ID = TMatch.RefID AND TourID = 1;
```

Output

Referee	Years of Experience
Maria Johnson	4
Jessica Davis	6
Jennifer Martinez	8
Linda Anderson	5
Karen Walker	4

4- Show the number of matches played in specific court and display the court type

Input

Run SQL

```
SELECT FName, Nationality, titles
FROM Player
WHERE Titles = (SELECT MAX(Titles) FROM Player);
```

Output

FName	Nationality	Titles
Khalid	United Arab Emirates	6

5- Show the number of matches played in specific court and display the court type

Input

Run SQL

```
SELECT COUNT(*) AS MatchesPlayed, court_type
FROM TMatch ,Court
WHERE tmatch.courtid=1 and tmatch.courtid=court.id
```

Output

MatchesPlayed	court_type
1	Hard Court

6- find the winner of a specific tournament

Input

Run SQL

```
SELECT Player.ID, Player.FName || ' ' || Player.MidName || ' ' || Player.SurName as Name
FROM Player

JOIN TMatch ON Player.ID = TMatch.WinnerID
WHERE TMatch.TourID = 1
GROUP BY Player.ID, Player.FName
HAVING COUNT(*) = (
  SELECT MAX(Wins_Count)
  FROM (
    SELECT COUNT(*) AS Wins_Count
    FROM Player
   , TMatch
    WHERE TMatch.TourID = 1 AND  Player.ID = TMatch.WinnerID
    GROUP BY Player.ID
  ) AS wins
);
```

Output

ID	Name
7	Yousef Mustafa Hammad

7- find the number of wins of each player in each tournament.

Input

Run SQL

```
SELECT
  Tournament.Tour_name AS Tournament_Name,
  Player.FName || ' ' || Player.MidName || ' ' || Player.SurName as FULL_NAME,
  COUNT(TMatch.WinnerID) AS Wins
FROM
  TMatch,Player,Tournament
  where TMatch.WinnerID = Player.ID AND TMatch.TourID = Tournament.ID
GROUP BY
  Tournament.ID,
  TMatch.WinnerID
ORDER BY
  Wins DESC;
```

Output

Tournament_Name	FULL_NAME	Wins
Middle East Open	Yousef Mustafa Hammad	2
Middle East Open	Ahmed Mahmoud Ibrahim	1
Middle East Open	Hussein Kareem Aziz	1
Middle East Open	Sami Saleh Hussein	1
Asian Competition	Mohammed Ali Abdullah	1
Asian Competition	Khalid Mohammed Rashid	1
Asian Competition	Khalid Jaber Ali	1
Bahrain Competition	Hassan Khalid Al-Masri	1
Bahrain Competition	Yousef Mustafa Hammad	1

8- get the player who has 0 wins.

Input

Run SQL

```
SELECT player.id, Player.FName, Player.ExperienceYears, player.Player_Rank
FROM Player
LEFT JOIN TMatch ON Player.ID = TMatch.WinnerID
WHERE TMatch.WinnerID IS NULL;
```

Output

ID	FName	ExperienceYears	Player_Rank
4	Ali	7	Intermediate
8	Nasser	4	Intermediate

9- Get the number of matches a referee has officate.

Input

Run SQL

```
SELECT Referee.ID, Referee.ref_name, COUNT(TMatch.RefID) AS "Matches Referred"
FROM Referee
LEFT JOIN TMatch
WHERE
Referee.ID = TMatch.RefID
GROUP BY Referee.ID, Referee.ref_name;
```

Output

ID	ref_name	Matches Referred
1	John Smith	1
2	Maria Johnson	1
3	David Wilson	1
4	Jessica Davis	1
5	Michael Thompson	1
6	Jennifer Martinez	1
7	James Taylor	1
8	Linda Anderson	1
9	Robert Thomas	1
10	Karen Walker	1

10- get the funds for each tournament.

Input

Run SQL

```
SELECT t.ID, t.Tour_name, SUM(f.Contribution) AS "Total Contribution"
FROM Tournament t, funds f
where t.ID = f.TourID
GROUP BY t.ID, t.Tour_name;
```

Output

ID	Tour_name	Total Contribution
1	Middle East Open	320000

11- Get all the details about a specific player.

Input

Run SQL

```
SELECT *
FROM Player
WHERE ID = 4;
```

Output

ID	FName	MidName	SurName	Nationality	BOD	Player_Rank	PracticeTime	ExperienceYears	Titles
4	Ali	Hassan	Rahim	Iraq	1991-03-08	Intermediate	140	7	1