DBMS PROJECT

International Cricket Council Management System

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Aim:

Aim of the project is to design and develop an ICC database using MySQL and DBMS concepts.Prepared the ER diagram,relational schema,set up the functional dependencies among various attributes,written SQL code using MySQL Workbench software, Normalized the database without any redundancies and finally extracted the data from the database in the form of queries.

Problem Statement:

The project is about database design of the International Cricket Council(ICC).In this project I have designed a database for international CricketCouncil(ICC) which helps the system to manage the information on ‘matches’ , ‘tournaments’ , ‘players’ etc. This will be managed by ICC.

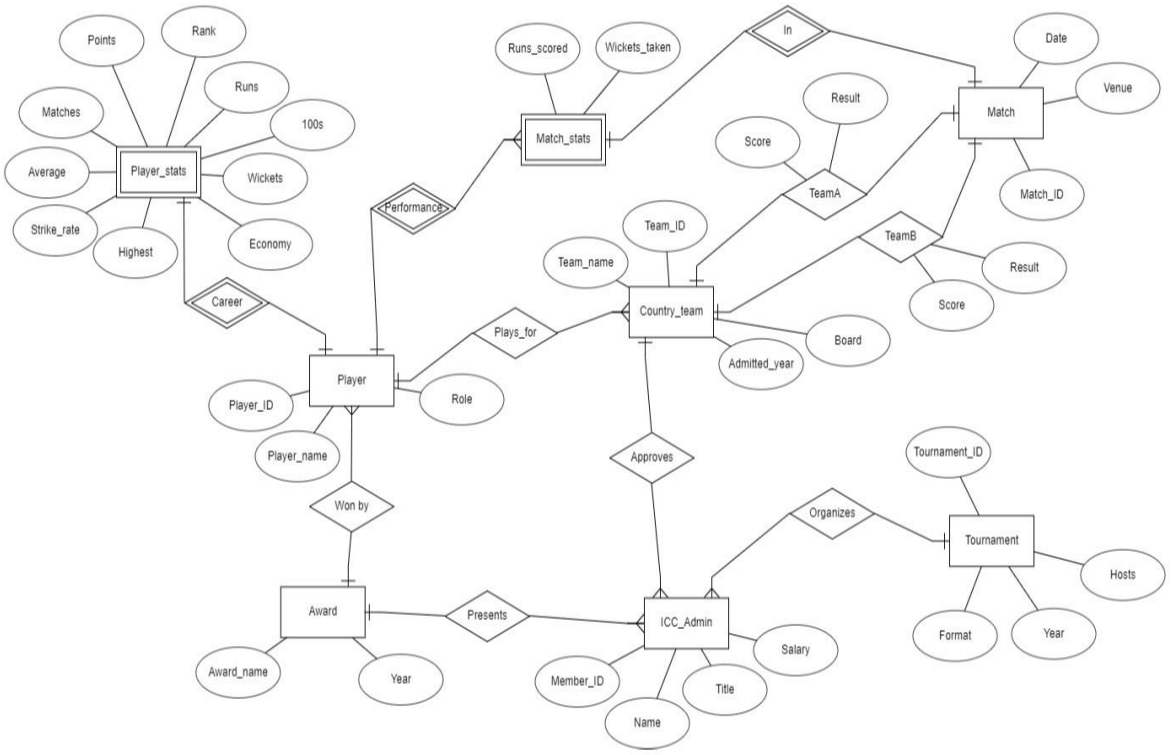
This will help them to maintain each player's records, information about the tournament, stats of every match.The database also contains the stats of every player by which we can keep track of their rankings. The awards can be distributed according to their performances which are presented by ICC admins.

The database rather than working on each player works for each match also so that we can keep track of each match stats and can improve the ranking of the country team by it. It gives us the facility to manage tournaments and awards accordingly.

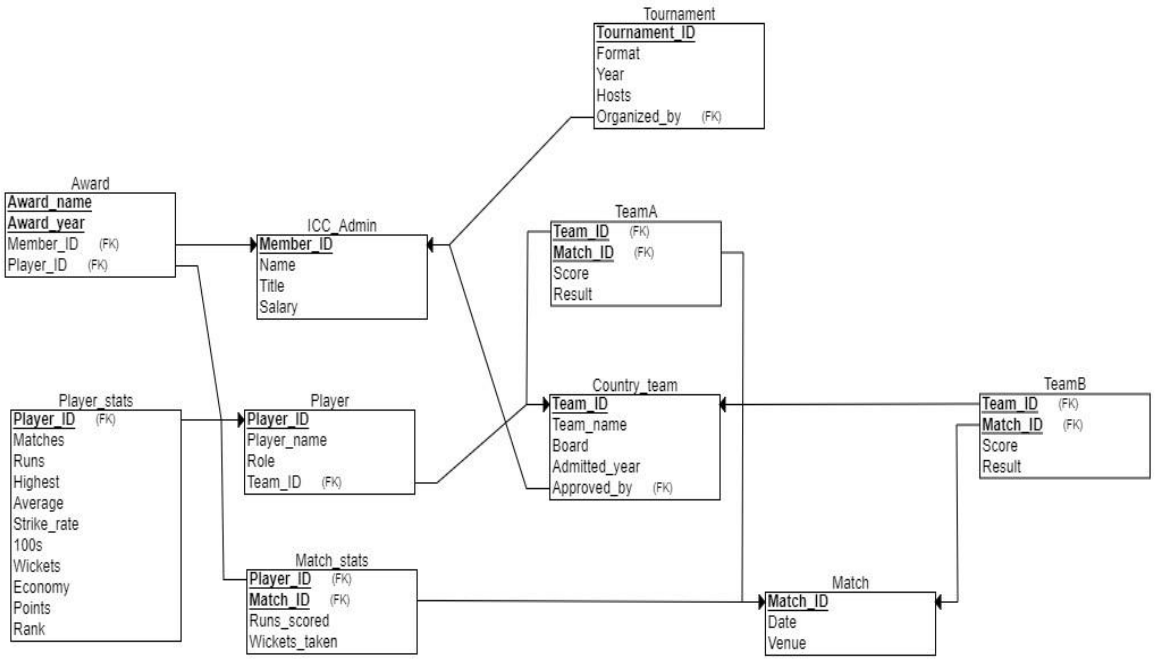
Assumptions:

- All the approvals and the activities are being headed by the admin of the ICC is named as ICCadmin.
- A player can only play for one country.

ER Diagram:


Points
Rank
Runs
Matches
100s
Average
Player_stats
Wickets
Strike_rate
Highest
Economy
Career
Runs_scored
Wickets_taken
Match_stats
<Performance>
In
Date
Venue
Result
Match
Score
TeamA
Match_ID
Team_ID
TeamB
Team_name
Result
Country_team
Score
Plays_for
Board
Admitted_year
Player
Player_ID
Role
Player_name
Approves
Tournament_ID
Won by
Organizes
Tournament
Hosts
Award
Presents
ICC_Admin
Salary
Format
Year
Award_name
Year
Member_ID
Title
Name

Relational Schema



Functional Dependencies and Primary Keys

1. ICC_Admin

Member_ID => Member_ID, Name,Title, Salary
Hence, (Member_ID)+ = R and Member_ID is a Primary Key.

2. Country_team

Team_ID =>
Team_ID,Team_name,Board,Admitted_year,Approved_by Hence,
(Team_ID)+ = R and Team_ID is a Primary Key. Approved_by is a
foreign key referencing ICC_Admin.

3. Tournament

Tournament_ID => Tournament_ID,Format,Year,Hosts,Organized_by
Hence,(Tournament_ID)+ = R and Tournament_ID is a Primary Key.
Organized_by is a foreign key referencing ICC_Admin.

4. Player

Player_ID => Player_ID,Player_name,Role,Team_ID
Hence,(Player_ID)+ = R and Player_ID is a Primary Key.
Team_ID is a foreign key referencing Country_team.

5. Award
Award_name,Award_year => Award_name,Award_year,Member_ID,Player_ID Hence, (Award_name,Award_year)+ = R. Therefore Award_name and Award_year both combinedly form Primary Key.(known as Composite key) Member_ID is a foreign key referencing ICC_Admin. Player_ID is a foreign key referencing Player.

6. Match
Match_ID => Match_ID, Date,Venue
Hence, (Match_ID)+ = R and Match_ID is a Primary Key.

7. TeamA
Team_ID,Match_ID => Team_ID,Match_ID,Score,Result
Hence, (Team_ID,Match_ID)+ = R and Team_ID and Match_ID both combinedly form Primary Key.(known as Composite key)
Team_ID is a foreign key referencing Country_team.
Match_ID is a foreign key referencing Match.

8. TeamB
Team_ID,Match_ID => Team_ID,Match_ID,Score,Result
Hence, (Team_ID,Match_ID)+ = R and Team_ID and Match_ID both combinedly form Primary Key.(known as Composite key)
Team_ID is a foreign key referencing Country_team.
Match_ID is a foreign key referencing Match.

9. Match_stats
Player_ID,Match_ID => Player_ID,Match_ID,Runs_scored,Wickets_taken
Hence,(Player_ID,Match_ID)+ = R and Player_ID and Match_ID both combinedly form Primary Key.(known as Composite key)
Player_ID is a foreign key referencing Player.
Match_ID is a foreign key referencing Match.

10.Player_stats
Player_ID => Player_ID, Matches,Runs,Highest,Average,Strike_rate,100s,Wickets, Economy, Points, Rank
Hence,(Player_ID)+ = R and Player_ID is a Primary Key.
Player_ID is a foreign key referencing Player.

NORMALIZATION

- **ICC_Admin:**

  Primary Key : Member_ID
  The only functional dependency in this table is also only of the primary key.
  Member_ID => (Name, Title, Salary)
  So, it is assured that the table does **not** contain **any partial or transitive dependencies**, which also implies that the table is obeying both 1NF, 2NF, 3NF and BCNF.
  All attributes have an atomic domain,hence the table is in 1NF.
  All attributes depend on the Member_ID,hence the table is in 2NF.
  All attributes depend directly on the Member_ID,hence the table is in 3NF.
  All determinants (Member_ID) is a Super key,hence the table is in BCNF.

- **Country_team:**

  Primary Key : Team_ID
  All attributes have an atomic domain,hence the table is in 1NF.
  All attributes depend on the Team_ID,hence the table is in 2NF.
  All attributes depend directly on the Team_ID,hence the table is in 3NF.
  All determinants (Team_ID) is a Super key,hence the table is in BCNF.

- **Tournament:**

  Primary Key : Tournament_ID
  All attributes have an atomic domain,hence the table is in 1NF.
  All attributes depend on the Tournament_ID,hence the table is in 2NF.
  All attributes depend directly on the Tournament_ID,hence the table is in 3NF.
  All determinants (Tournament_ID) is a Super key,hence the table is in BCNF.

- **Player:**

  Primary Key : Player_ID
  All attributes have an atomic domain,hence the table is in 1NF.
  All attributes depend on the Player_ID,hence the table is in 2NF.
  All attributes depend directly on the Player_ID,hence the table is in 3NF.
  All determinants (Player_ID) is a Super key,hence the table is in BCNF.

- **Award:**

  Primary Key : (Award_name, Award_year)
  All attributes have an atomic domain,hence the table is in 1NF.
  All attributes depend on the (Award_name, Award_year),hence the table is in 2NF.
  All attributes depend directly on the (Award_name, Award_year),hence the table is in 3NF.
  All determinants (Award_name, Award_year) is a Super key,hence the table is in BCNF.

- **Match:**

Primary Key : Match_ID
All attributes have an atomic domain,hence the table is in 1NF.
All attributes depend only on the Match_ID, hence the table is in 2NF.
All attributes depend directly on the Match_ID, hence the table is in 3NF.
All determinants (Match_ID) is a Super Key, hence the table is in BCNF.

- **TeamA:**
  Primary Key : (Team_ID, Team_name)
  All attributes have an atomic domain,hence the table is in 1NF.
  All attributes depend on the (Team_ID, Team_name),hence the table is in 2NF.
  All attributes depend directly on the (Team_ID, Team_name),hence the table is in 3NF.
  All determinants (Team_ID, Team_name) is a Super key,hence the table is BCNF.

- **TeamB:**
  Primary Key : (Team_ID, Team_name)
  All attributes have an atomic domain,hence the table is in 1NF.
  All attributes depend on the (Team_ID, Team_name),hence the table is in 2NF.
  All attributes depend directly on the (Team_ID, Team_name),hence the table is in 3NF.
  All determinants (Team_ID, Team_name) is a Super key,hence the table is BCNF.

- **Match_stats:**
  Primary Key : (Player_ID, Match_ID)
  All attributes have an atomic domain,hence the table is in 1NF.
  All attributes depend on the (Player_ID,Match_ID),hence the table is in 2NF.
  All attributes depend directly on the (Player_ID,Match_ID),hence the table is in 3NF. All determinants (Player_ID,Match_ID) is a Super key,hence the table is BCNF.

- **Player_stats:**
  Primary Key : Player_ID
  It is a weak entity set because the primary key of the 'Player' acts as the foreign key which will act as primary key to this table.
  All attributes have an atomic domain,hence the table is in 1NF.
  All attributes depend only on the Player_ID, hence the table is in 2NF.
  All attributes depend directly on the Player_ID, hence the table is in 3NF.
  All determinants (Player_ID) is a Super Key, hence the table is in BCNF.

TABLE CREATION

- ICC_Admin

```sql
CREATE DATABASE Icc;

CREATE TABLE icc_admin
(
  member_id INT NOT NULL,
  name VARCHAR(30) NOT NULL,
  title VARCHAR(30) NOT NULL,
  salary INT NOT NULL,
  PRIMARY KEY (member_id)
);
```

- Country_team

```sql
CREATE TABLE country_team
(
  team_id INT NOT NULL,
  team_name VARCHAR(20) NOT NULL,
  board VARCHAR(10) NOT NULL,
  admitted_year INT NOT NULL,
  approved_by INT NOT NULL,
  PRIMARY KEY (team_id),
  FOREIGN KEY (approved_by) REFERENCES icc_admin(member_id)
);
```

- Tournament

```sql
CREATE TABLE tournament
(
  tournament_id INT NOT NULL,
  format VARCHAR(10) NOT NULL,
  year INT NOT NULL,
  hosts VARCHAR(20) NOT NULL,
  organized_by INT NOT NULL,
  PRIMARY KEY (tournament_id),
  FOREIGN KEY (organized_by) REFERENCES icc_admin(member_id)
);
```

- **Player**

```
CREATE TABLE player
(
  player_id INT NOT NULL,
  player_name VARCHAR(30) NOT NULL,
  role VARCHAR(20) NOT NULL,
  team_id INT NOT NULL,
  PRIMARY KEY (player_id),
  FOREIGN KEY (team_id) REFERENCES country_team(team_id)
);
```

- **Award**

```
CREATE TABLE award
(
  award_name VARCHAR(30) NOT NULL,
  award_year INT NOT NULL,
  player_id INT NOT NULL,
  member_id INT NOT NULL,
  PRIMARY KEY (award_name,award_year),
  FOREIGN KEY (player_id) REFERENCES player(player_id),
  FOREIGN KEY (member_id) REFERENCES icc_admin(member_id)
);
```

- **Match**

```
2
3   CREATE TABLE match
4   (
5       match_id INT NOT NULL,
6       played_date DATE,
7       venue VARCHAR(30) NOT NULL,
8       PRIMARY KEY (match_id)
9   );
10
```

- **TeamA**

```sql
CREATE TABLE teamA
(
  match_id INT NOT NULL,
  team_id INT NOT NULL,
  score INT NOT NULL,
  result VARCHAR(10) NOT NULL,
  PRIMARY KEY (match_id,team_id),
  FOREIGN KEY (match_id) REFERENCES match(match_id),
  FOREIGN KEY (team_id) REFERENCES country_team(team_id)
);
```

- **TeamB**

```sql
CREATE TABLE teamB
(
  match_id INT NOT NULL,
  team_id INT NOT NULL,
  score INT NOT NULL,
  result VARCHAR(10) NOT NULL,
  PRIMARY KEY (match_id,team_id),
  FOREIGN KEY (match_id) REFERENCES match(match_id),
  FOREIGN KEY (team_id) REFERENCES country_team(team_id)
);
```

- **Match_stats**

```sql
CREATE TABLE match_stats
(
  player_id INT NOT NULL,
  match_id INT NOT NULL,
  runs_scored INT NOT NULL,
  wickets_taken INT NOT NULL,
  PRIMARY KEY (player_id,match_id),
  FOREIGN KEY (player_id) REFERENCES player(player_id),
  FOREIGN KEY (match_id) REFERENCES match(match_id)
);
```

- **Player_stats**

```sql
CREATE TABLE player_stats
(
  player_id INT NOT NULL,
  matches INT NOT NULL,
  runs INT NOT NULL,
  average DECIMAL(4,2),
  strike_rate DECIMAL(5,2),
  100s INT NOT NULL,
  highest INT NOT NULL,
  wickets INT NOT NULL,
  economy INT NOT NULL,
  points INT NOT NULL,
  icc_rank INT NOT NULL,
  PRIMARY KEY (player_id),
  FOREIGN KEY (player_id) REFERENCES player(player_id)
);
```

DATA INSERTION

```sql

INSERT INTO player_stats VALUES(401,262,12344,183,57.68,92.44,43,4,6.22,744,5);
INSERT INTO player_stats VALUES(402,233,9376,264,48.58,89.18,29,8,5.21,740,6);
INSERT INTO player_stats VALUES(403,72,47,14,6.71,50.54,0,121,4.64,662,4);
INSERT INTO player_stats VALUES(404,158,6207,133,50.06,86.93,16,26,5.77,691,13);
INSERT INTO player_stats VALUES(405,113,707,65,16.44,86.96,0,151,4.94,NULL,NULL);
INSERT INTO player_stats VALUES(406,17,239,46,21.73,84.15,0,17,5.34,74,434,74);
INSERT INTO player_stats VALUES(407,135,5680,179,44.38,95.13,24,0,8,739,7);
INSERT INTO player_stats VALUES(408,32,102,19,17,68.46,0,62,5.51,661,5);
INSERT INTO player_stats VALUES(409,83,1114,60,21.02,105.69,0,158,4.17,651,8);
INSERT INTO player_stats VALUES(410,122,3648,141,36.85,84.42,6,70,4.9,NULL,30);
INSERT INTO player_stats VALUES(411,105,2924,102,38.99,95.09,3,74,6.05,NULL,NULL);
INSERT INTO player_stats VALUES(412,52,1555,118,36.16,96.11,1,6,6.18,NULL,29);
INSERT INTO player_stats VALUES(413,9,28,11,8,47.46,0,10,4.07,433,75);
INSERT INTO player_stats VALUES(414,221,6755,134,37.53,82.26,9,285,4.44,619,16);
INSERT INTO player_stats VALUES(415,31,604,80,25.17,103.42,0,34,5.1,531,39);
INSERT INTO player_stats VALUES(416,132,5774,178,46.19,96.2,17,0,NULL,784,3);
INSERT INTO player_stats VALUES(417,132,4554,164,44.21,88.2,11,28,5.41,672,20);
INSERT INTO player_stats VALUES(418,350,10773,183,50.58,87.56,10,1,5.17,NULL,NULL);
INSERT INTO player_stats VALUES(419,92,4664,158,59.79,89.74,17,0,NULL,890,1);

```