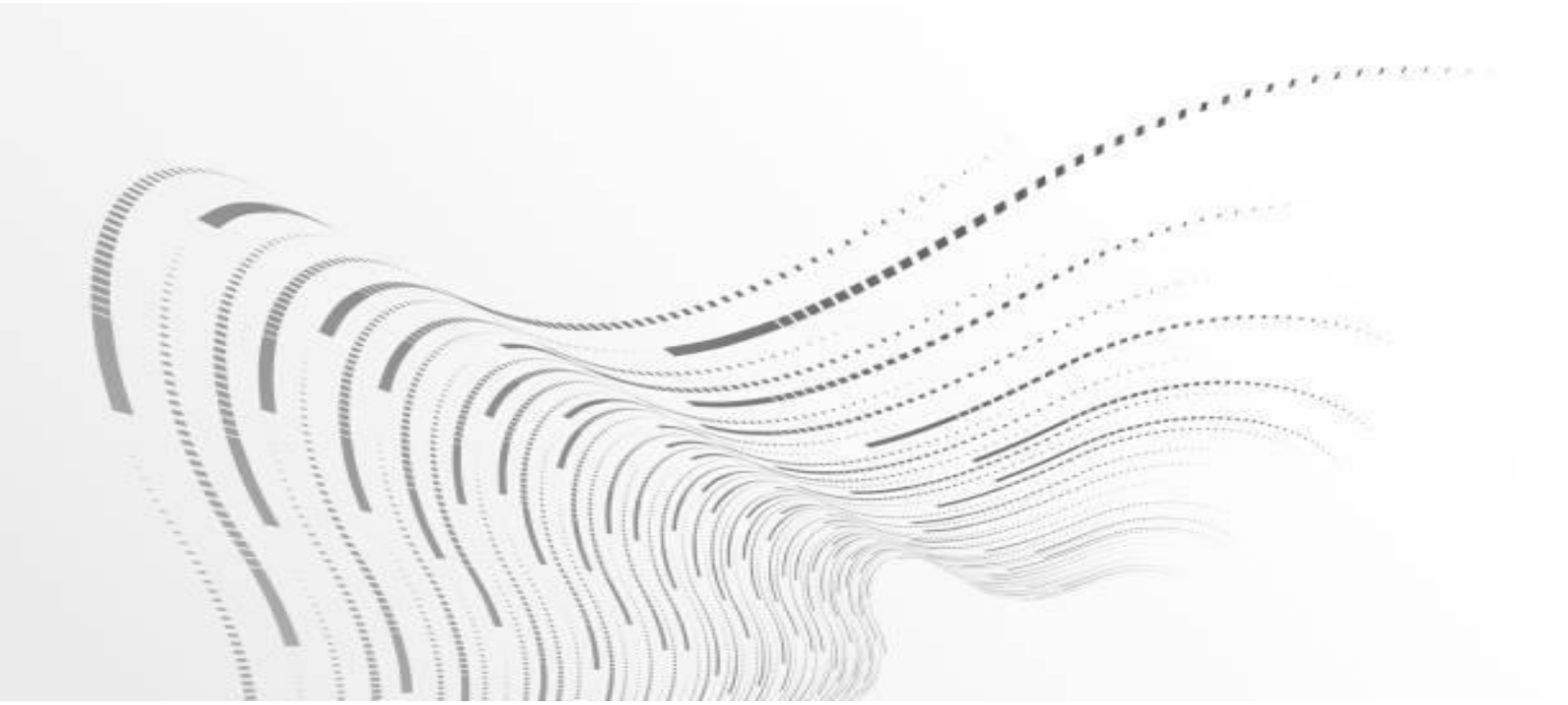
Database Systems Final Assignment



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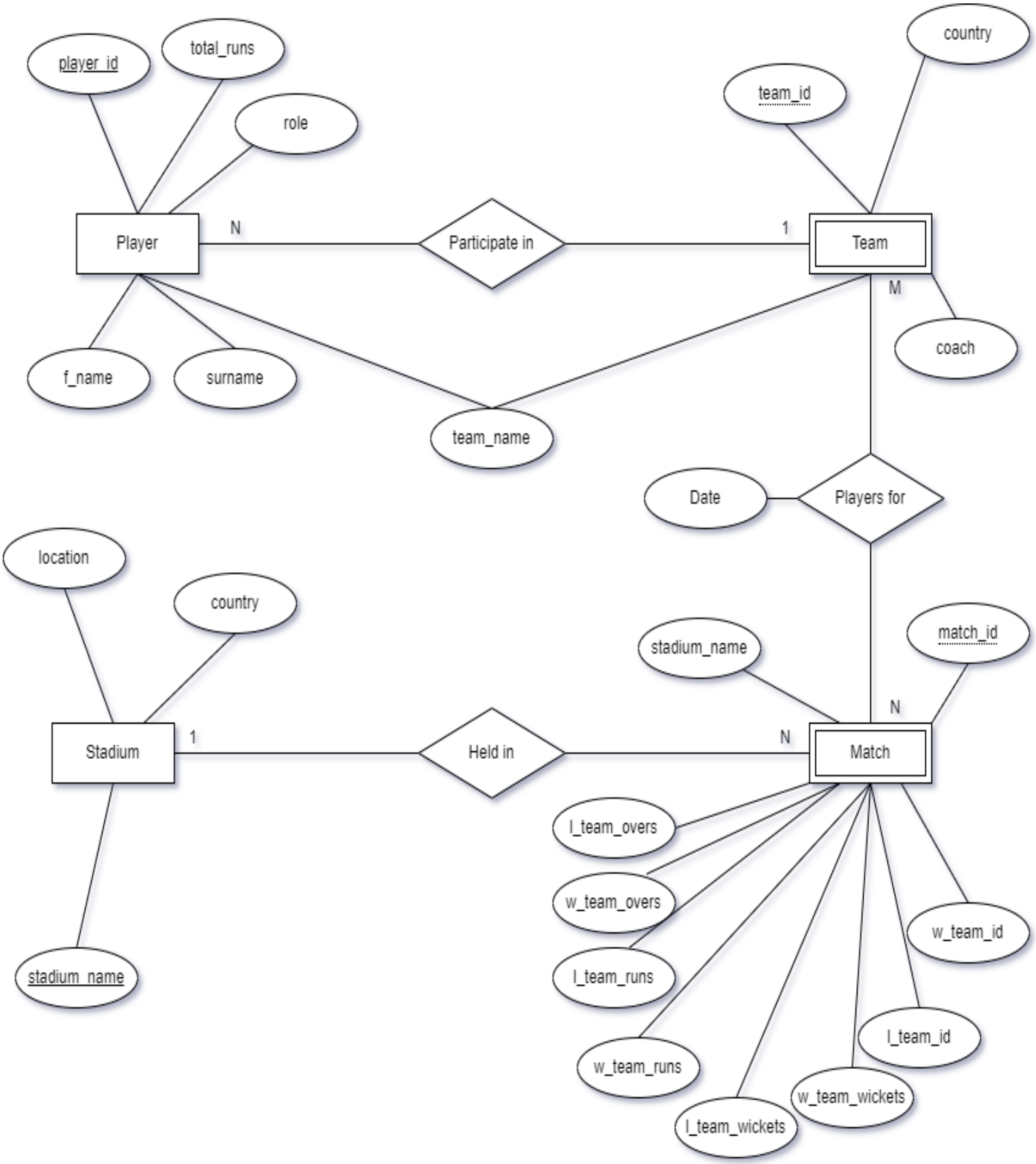
Contents

Introduction

I have selected the Cricket Scenario to complete model my database. I have selected the t20 series. I have implemented the database and inserted sample data into the database to test the constraints I have implemented. Queries are also saved to a source file. Python connecter is also implemented from which you can run a query directly.

Design of Database


player_id
total_runs
role
Player
N
Participate in
1
Team
country
team_id
M
coach
f_name
surname
team_name
Date
Players for
location
country
Stadium
1
Held in
N
Match
stadium_name
match_id
N
stadium_name
l_team_overs
w_team_overs
l_team_runs
w_team_runs
l_team_wickets
w_team_wickets
l_team_id
w_team_id

ER Diagram

Relational Schema

Team (team_id, team_name, country, coach)

Player (p_id, team_id, fname, surname, role)

FK team_id REF Team(team_id)

Stadium (stadium_name, country, location, capacity)

Match (match_id, wteam_id, lteam_id, stadium_name, wteam_runs, wteam_wickets, lteam_runs, lteam_wickets, wteam_overs, lteam_overs)

FK wteam_id REF Team(team_id)

FK lteam_id REF Team(team_id)

FK stadium_name REF Stadium(stadium_name)

Participate In (match_id, wteam_id, lteam_id, stadium_name, wteam_runs, wteam_wickets, lteam_runs, lteam_wickets, wteam_overs, lteam_overs, date)

FK wteam_id REF Team(team_id)

FK lteam_id REF Team(team_id)

FK stadium_name REF Stadium(stadium_name)

Data Description

Team						
Description: Keeps all the data about the teams that participate in cricket matches						
Attribute	**Type**	**Size**	**Null**	**Primary Key**	**Description**	**Other Constraints**
team_id	char	6	N	Y	Unique identification ID assigned to each team, can include both numbers and characters	
team_name	varchar	25	N		The name of the team	
country	varchar	25	N		The name of the country which the team is from	
coach	varchar	25	Y		The name of the coach for the team (if one exists)	

Player						
Description: Keeps all the data about the players who play cricket and which team they play for						
Attribute	**Type**	**Size**	**Null**	**Primary Key**	**Description**	**Other Constraints**
p_id	char	6	N	Y	Unique identification ID assigned to each player, can include both numbers and characters	
team_id	varchar	25	N		The name of team which the player plays for	FK
fname	varchar	25	N		The first name of the player	
surname	varchar	25	N		The surname name of the player	
role	varchar	4	N		Whether the player bats or balls or both	Can be either bat or bowl or both

Stadium						
Description:						
Attribute	**Type**	**Size**	**Null**	**Primary Key**	**Description**	**Other Constraints**
stadium_name	varchar	25	N	Y	The name of the stadium that the match was played at	
country	varchar	25	N		The name of the country where the stadium is located at	
location	varchar	35	N		The address of the stadium	
capacity	Int	6	N		The maximum number of people permitted to be in the stadium	

Matches						
Description: Keeps all the data about the matches that the teams participate in and at which stadium that match takes place						
Attribute	**Type**	**Size**	**Null**	**Primary Key**	**Description**	**Other Constraints**
match_id	char	6	N	Y	Unique identification ID assigned to each match, can include both numbers and characters	
wteam_id	char	6	N		The unique match ID of the winning team from the Teams table	FK
lteam_id	char	6	N		The unique match ID of the loosing team from the Teams table	FK
wteam_runs	Int	3	N		The number of runs that was scored by the winning team	
wteam_overs	Int	2	N		The number of overs used by the winning team	less than 20 and more than 0
wteam_wickets	Int	2	N		The number of wickets left by the winning team	less than 10 more than 0
lteam_runs	Int	3	N		The number of runs that was scored by the loosing team	
lteam_overs	Int	2	N		The number of overs used by the loosing team	less than 20 and more than 0
lteam_wickets	int	2	N		The number of wickets left by the loosing team	less than 10 more than 0
match_date	varchar	10	N		The date the match is held.	
stadium_name	varchar	25	N		The name of the stadium the match was played at from the Stadium table	FK

Assumptions

It is assumed that all the matches and teams participating are played for the T20 series, and NOT other series such as ICC, test matches etc., therefore; the number of overs and wickets are 20 and 10 respectively.

It is also assumed that all names are within 25 characters, the database does not allow names more than this limit. Please not that first name and surname can have up 25 characters each.

It is also assumed that one cricket player and either both bat or bowl or one of them.

Implementation of the Database and Adding Sample Data

Implementation

Creating tables:

```
-- Team table
create table Team(
        team_id char(6) not null primary key,
        team_name varchar(25) not null,
        country varchar(25) not null,
        coach varchar(25));
```

```
-- Player table
create table Player(
        p_id char(4) not null primary key,
        team_id char(6),
        fname varchar(25) not null,
        surname varchar(25) not null,
        role varchar(25) not null,
        foreign key (team_id) references Team(team_id));
```

```
-- Stadium table
create table Stadium(
        stadium_name varchar(25) primary key,
        country varchar(25) not null,
        location varchar(25) not null,
        capacity int(6) not null);
```

```sql
-- Match table
create table Matches(
        match_id char(6) not null primary key,
        wteam_id char(6),
        lteam_id char(6),
        wteam_runs int(3) not null,
        wteam_overs int(2) not null,
        wteam_wickets int(2) not null,
        lteam_runs int(3) not null,
        lteam_overs int(2) not null,
        lteam_wickets int(2) not null,
        match_date varchar(10) not null,
        stadium_name varchar(25),
        foreign key (wteam_id) references Team(team_id),
        foreign key (lteam_id) references Team(team_id),
        foreign key (stadium_name) references Stadium(stadium_name));
```

After running create_tables:

```
mysql> source create_tables.sql;
Query OK, 0 rows affected (0.09 sec)

Query OK, 0 rows affected (0.10 sec)

Query OK, 0 rows affected, 1 warning (0.06 sec)

Warning (Code 1681): Integer display width is deprecated and will be removed in
 a future release.
Query OK, 0 rows affected, 6 warnings (0.10 sec)

Warning (Code 1681): Integer display width is deprecated and will be removed in
 a future release.
Warning (Code 1681): Integer display width is deprecated and will be removed in
 a future release.
Warning (Code 1681): Integer display width is deprecated and will be removed in
 a future release.
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 a future release.
Warning (Code 1681): Integer display width is deprecated and will be removed in
 a future release.
Warning (Code 1681): Integer display width is deprecated and will be removed in
 a future release.
```

(The warning here has something to do with my SQL version, it is due to me having limits on my Int attributes, but it does not seem to cause an issue)

```
mysql> show tables;
+------------------+
| Tables_in_finals |
+------------------+
| Matches          |
| Player           |
| Stadium          |
| Team             |
+------------------+
4 rows in set (0.00 sec)
```

Sample Data

```
--entering Team Sample Data

insert into Team values('TID001', 'India National Team', 'India', 'Rahul
Dravid');
insert into Team values('TID002', 'Australia National Team', 'Australia',
'Andrew McDonald');
insert into Team values('TID003', 'Sri Lanka National Team', 'Sri Lanka',
'Chris Silverwood');
insert into Team values('TID004', 'England National Team', 'England',
'Brendon McCullum');
insert into Team values('TID005', 'Pakistan National Team', 'Pakistan',
'Saqlain Mushtaq');
```

```
--entering Player Sample Data

insert into Player values('P00001','TID004','Jason','Roy', 'Bat');
insert into Player values('P00002','TID003','Dhananjaya','De Silva', 'Bat');
insert into Player values('P00003','TID001','Shikhar','Dhawan', 'Bat');
insert into Player values('P00004','TID003','Charith','Asalanka', 'Bat');
insert into Player values('P00005','TID003','Danushka','Gunathilaka', 'Bat');
insert into Player values('P00006','TID003','Pathum','Nissanka', 'Bat');
insert into Player values('P00007','TID003','Dushmantha','Chameera', 'Ball');
insert into Player values('P00008','TID003','Lahiru','Kumara', 'Ball');
insert into Player values('P00009','TID003','Pramod','Madushan', 'Ball');
```

```sql
--entering Stadium Sample Data

insert into Stadium values('Narendra Modi Stadium', 'India', 'Ahmedabad',
132000);
insert into Stadium values('Melbourne Cricket Ground', 'Australia',
'Melbourne', 100000);
insert into Stadium values('Eden Gardens', 'India', 'Kolkata', 70000);
insert into Stadium values('Perth Stadium', 'Australia', 'Perth', 61266);
insert into Stadium values('Adelaide Oval', 'Australia', 'Adeleide', 53583);
insert into Stadium values('Sydney Cricket Ground', 'Australia', 'Sydney',
48000);
insert into Stadium values('R. Premadasa Stadium', 'Sri Lanka', 'Colombo',
35000);
```

```sql
insert into Matches values('M001', 'TID004', 'TID001', 130, 00, 3, 124, 00,
02,'12/05/2021','Narendra Modi Stadium');
insert into Matches values('M002', 'TID003', 'TID001', 133, 00, 6, 132, 00,
05,'28/07/2021','R. Premadasa Stadium');
```

After inserting data:

```
mysql> source insert_data.sql
Query OK, 1 row affected (0.01 sec)

Query OK, 1 row affected (0.01 sec)

Query OK, 1 row affected (0.01 sec)

Query OK, 1 row affected (0.01 sec)

Query OK, 1 row affected (0.01 sec)

Query OK, 1 row affected (0.00 sec)

Query OK, 1 row affected (0.01 sec)

Query OK, 1 row affected (0.00 sec)

Query OK, 1 row affected (0.01 sec)

Query OK, 1 row affected (0.01 sec)

Query OK, 1 row affected (0.01 sec)

Query OK, 1 row affected (0.01 sec)

Query OK, 1 row affected (0.00 sec)

Query OK, 1 row affected (0.01 sec)
```

Matches Database:

```
mysql> select * from Matches;
+----------+----------+----------+------------+-------------+---------------+--
---------+-------------+---------------+------------+----------------------+
| match_id | wteam_id | lteam_id | wteam_runs | wteam_overs | wteam_wickets | l
team_runs | lteam_overs | lteam_wickets | match_date | stadium_name         |
+----------+----------+----------+------------+-------------+---------------+--
---------+-------------+---------------+------------+----------------------+
| M001     | TID004   | TID001   |        130 |           0 |             3 |
      124 |           0 |             2 | 12/05/2021 | Narendra Modi Stadium |
| M002     | TID003   | TID001   |        133 |           0 |             6 |
      132 |           0 |             5 | 28/07/2021 | R. Premadasa Stadium  |
+----------+----------+----------+------------+-------------+---------------+--
---------+-------------+---------------+------------+----------------------+
2 rows in set (0.01 sec)
```

Integrity Constraints

When inaccurate data is attempted to be inserted, it will prevent said data from being inserted according to the database description I have provided.

```
mysql> insert into Matches values('M002', 'TID003', 'TID001', 133, 00, 6, 132,
00, 05,'28/07/20021','R. Premadasa Stadium');
```

Trying to enter 20021 instead of 2021, the database detected the length of the date is too long.

```
ERROR 1406 (22001): Data too long for column 'match_date' at row 1
mysql>
```

Use of the Database

Design and implementing of queries

Q1: search for the team that won in the match which was held in R. Premadasa Stadium.

```
mysql> select Team.team_name, Team.country from Team, Matches where wteam_id =
team_id AND Matches.stadium_name = 'R. Premadasa Stadium';
+-------------------------+-----------+
| team_name               | country   |
+-------------------------+-----------+
| Sri Lanka National Team | Sri Lanka |
+-------------------------+-----------+
1 row in set (0.00 sec)
```

Q2. Search for all the players in the Sri Lanka team.

```
mysql> select Player.fname, Player.surname from Player, Team where Team.country
 = 'Sri Lanka';
+------------+-------------+
| fname      | surname     |
+------------+-------------+
| Jason      | Roy         |
| Dhananjaya | De Silva    |
| Shikhar    | Dhawan      |
| Charith    | Asalanka    |
| Danushka   | Gunathilaka |
| Pathum     | Nissanka    |
| Dushmantha | Chameera    |
| Lahiru     | Kumara      |
| Pramod     | Madushan    |
+------------+-------------+
9 rows in set (0.01 sec)
```

Q3. Search for all the bowlers in Sri Lankan Team.

```
mysql> select Player.fname, Player.surname, Player.role from Player, Team where
 Team.country = 'Sri Lanka' and Player.role = 'ball';
+------------+----------+------+
| fname      | surname  | role |
+------------+----------+------+
| Dushmantha | Chameera | Ball |
| Lahiru     | Kumara   | Ball |
| Pramod     | Madushan | Ball |
+------------+----------+------+
3 rows in set (0.00 sec)
```

Q3. Search the number of runs the opponent scored against England.

```
mysql> select Matches.wteam_runs, Team.team_name from Matches, Team where Team.
country = 'England' and Matches.wteam_id = Team.team_id;
+------------+----------------------+
| wteam_runs | team_name            |
+------------+----------------------+
|        130 | England National Team |
+------------+----------------------+
1 row in set (0.01 sec)
```

Design and implementation of advanced features

Procedure to add a stadium.

```
DELIMITER //
CREATE PROCEDURE addStadium(stadium_name varchar(25), country varchar(25),
location varchar(25), capacity int(6))
COMMENT 'Adding new Stadium'
BEGIN
        INSERT INTO Stadium(stadium_name, counrty, location, capacity);
END //
DELIMITER ;
CALL addStadium('Asgiriya Stadium', 'Sri Lanka', 'Kandy', 10000);
```

```
DELIMITER //
CREATE TRIGGER updateWteam_runs
AFTER UPDATE ON Matches
FOR EACH ROW
BEGIN
        UPDATE Matches
        SET Matches.wteam_runs = New.Runs WHERE Matches.wteam_runs =
NEW.wteam_runs;
END //
DELIMITER ;

DELIMITER //
CREATE TRIGGER updateLteam_runs
AFTER UPDATE ON Matches
FOR EACH ROW
BEGIN
        UPDATE Matches
        SET Matches.lteam_runs = New.Runs WHERE Matches.lteam_runs =
NEW.lteam_runs;
END //
DELIMITER ;
```

Database connectivity and Python implementation

```
import mysql.connector

conn = mysql.connector.connect(host = "loaclhost", user = "root", passwd =
"hello123", database = "final2")

dbCursor = conn.cursor()
saveCursor = conn.cursor()

query_1 = ("select Team.team_name, Team.country from Team, Matches where
wteam_id = team_id AND Matches.stadium_name = 'R. Premadasa Stadium';")

for i in dbcursor:
        print(i)
```

Updating the Runs scored by the winning/losing team in a match.

Discussion

References

List of Twenty20 International cricket grounds

https://en.wikipedia.org/wiki/List_of_Twenty20_International_cricket_grounds

Match history

http://www.howstat.com/cricket/statistics/matches/MatchList_T20.asp?Group=20210101202112 31&Range=2021