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Curtin University – Department of Computing

Assignment Cover Sheet / Declaration of Originality

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Last name:	Navullage	Student ID:	20688651
Other name(s):	Nethmi Nawanga Silva		
Unit name:	Database Systems	Unit ID:	ISYS2014
Lecturer / unit coordinator:	Mr. Prasanna	Tutor:	
Date of submission:	27/10/2022	Which assignment?	Final (Leave blank if the unit has only one assignment.)

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2022

REPORT

ISYS2014/ ISYS5008 FINAL ASSIGNMENT

NAME: NAVULLAGE NETHMI NAWANGA SILVA

CURTIN ID: 20688651

INTRODUCTION

The following assessment offered me two scenarios to build my assessment on and I have selected scenario one which was regarding International Cricket Tournaments held around the world. I chose to focus on one international tournament which is the T20 World Cup Tournaments held from year 2007 to the year of 2021, instead of working on all the matches held in a series, I focused on the two semifinals matches and the final match that is held per series. I was able to find a dataset matching my requirements on https://www.kaggle.com/ which helped me build my tables and add sample values to it.

First, I identified my entities, attributes and relationships and created an ER Model for it, then I went ahead with the relational schema to help refine the tables built. I also created a separate table mentioning multiple business rules for the following scenario.

I then implemented the designed database and used the data I found on https://www.kaggle.com/datasets/gauravarora1091/t20-world-cups20072021 to add sample data into my tables.

Part three of the assessment required me to come up with 6-10 questions to build queries on, I came up with 9 questions and built appropriate SQL queries to each one of them to produce the required answers. I was able to demonstrate basic SQL statements, aggregate functions and related clauses.

For the next part of the assessment which required me to use at least two advanced features, I managed to complete the task by creating multiple uses of views, procedures and demonstrate a use of indexes.

The assessment consisted of a part 5 task where the database created was to be linked with Python3 to call the already defined queries and demonstrate them. I created a python file which uses all of the queries made in part 3 of the assignment and demonstrates the output from the database.

I was able to present a completed assessment, demonstrating all the required answers to the questions and tasks given.

DESIGN OF THE DATABASE

1. ENTITIES, RELATIONSHIPS, DATA TYPES AND ATTRIBUTES

Reading scenario one provided with me an overall sketch on how to design my database, therefore I sketched and decided on my entities and relationships needed beforehand and then further refined them after referring to the dataset on https://www.kaggle.com/datasets/gauravarora1091/t20-world-cups20072021.

I implemented four main entities with the following attributes:

1. **Players** - PlayerId, PlayerName
2. **Team** - TeamCountry
3. **Venue** – VenueName, VenueLocation
4. **MatchDetails** – Mid, Year, TeamOne, TeamTwo
5. **Score** – scored, TeamOneScore, TeamTwoScore, Winner

I linked all of the above entities using the following relationships.

ENTITY ONE	RELATIONSHIP	ENTITY TWO
Players	PlayOn	Team
Team	Plays	MatchDetails
Venue	PlayedAt	MatchDetails
MatchDetails	Result	Score

The following relationships, entities and attributes helped me to cover up all of the necessary details needed.

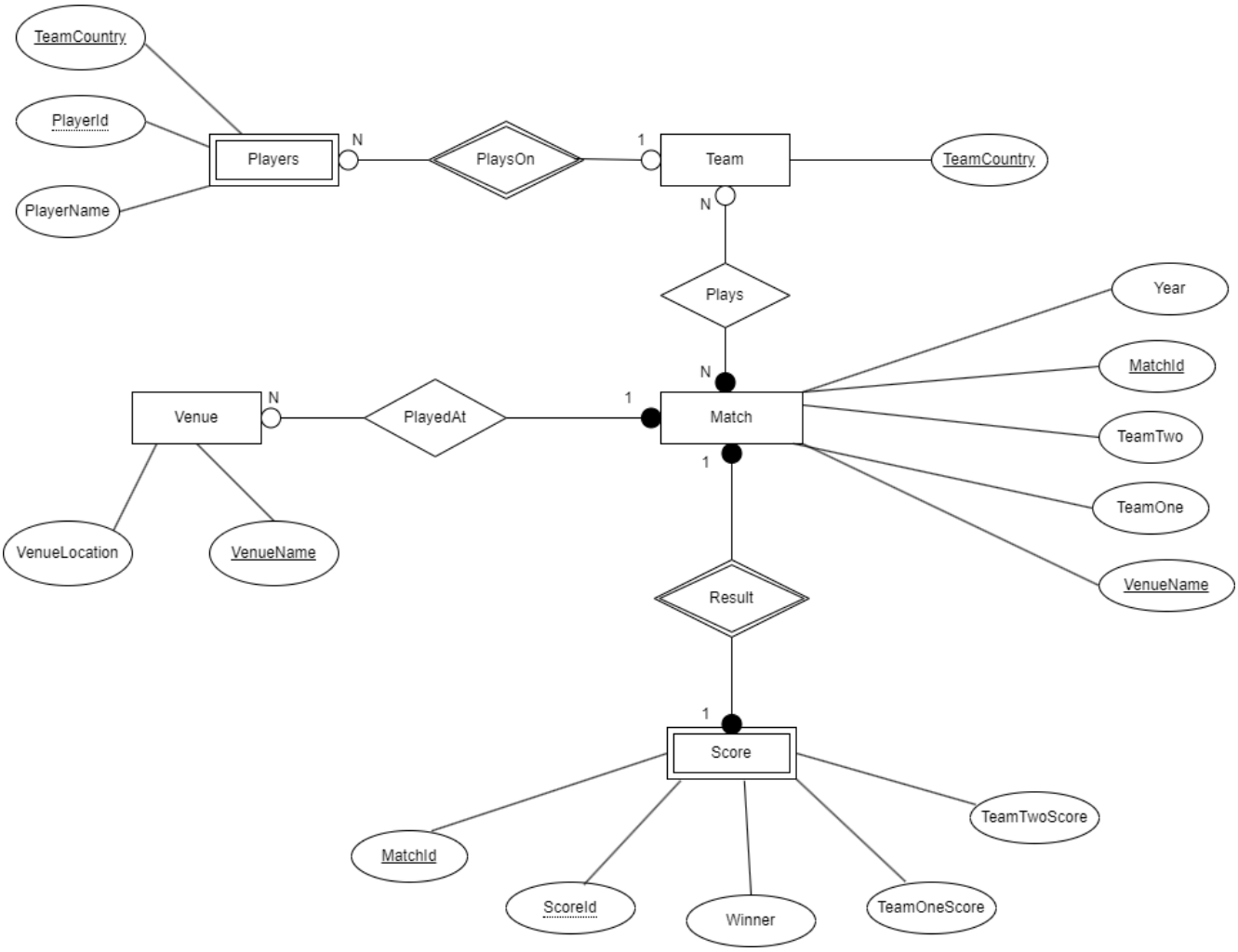
2. ER DIAGRAM, RELATIONAL SCHEMA, DATA DESCRIPTION

Using the entities, relationships and attributes created above, I created the ER diagram with the use of draw.io application. I built the relational schema and made sure the tables are in third normal form before proceeding with the rest of the tasks.

I provided each attribute with a data type that is suitable for it, I also decided to not use DATETIME data type on the attribute year as it made things slightly complex as I was only using the year the matches were held in and not the dates thus, I went ahead with INT; id's such as Mid(matchId) and scoreId were build using the CHAR data type because they contain both characters and numbers.

The ER diagram, relational schema and the data descriptions are mentioned below.

ER DIAGRAM


TeamCountry
PlayerId
PlayerName
Players
N
PlaysOn
1
Team
TeamCountry
N
Plays
Year
MatchId
TeamTwo
TeamOne
VenueName
N
Venue
PlayedAt
1
Match
1
VenueLocation
VenueName
Result
1
Score
TeamTwoScore
MatchId
ScoreId
Winner
TeamOneScore

RELATIONAL SCHEMA

Converting ER diagram to a relational schema:

1. Team (TeamCountry)
   Players (PlayerId, PlayerName, TeamCountry)
   FK TeamCountry REF Team (TeamCountry)

2. Venue (Venue Name, VenueLocation)
   MatchDetails (MId, Year, TeamOne, TeamTwo)
   FK VenueName REF Venue (VenueName)

3. Team (TeamCountry)
   Match (MId, Year, TeamOne, TeamTwo)
   Plays (MId, TeamCountry)
   FK MId REF Match (MId)
   FK TeamCountry REF Team (TeamCountry)

4. Match (MId, Year, TeamOne, TeamTwo)
   Score (ScoreId, TeamOneScore, TeamTwoScore, Winner, MId)
   FK MId REF Match (MId)

DATA DESCRIPTIONS OF TABLES AFTER RELATIONAL SCHEMA

Team

Attribute	Type	size	Null	Primary Key	Description	Other Constraints
TeamCountry	Varchar	255	N	Y	Name of the country the team is playing for	

Player

Attribute	Type	Size	Null	Primary Key	Description	Other Constraints
PlayerId	Char	8	N	Y	Player Id	
PlayerName	Varchar	255	N	N	Best player Name	
TeamCountry	Varchar	255	N	FK (foreign key)	Country the player is playing for	

Venue

Attribute	Type	Size	Null	Primary Key	Description	Other Constraints
VenueName	Varchar	255	N	Y	Name of the stadium	
VenueLocation	Varchar	255	N	N	Location of stadium	

Match

Attribute	Type	Size	Null	Primary Key	Description	Other Constraints
MId	Char	8	N	Y	Match Id	
TeamOne	Varchar	255	N	N	Team one playing	
TeamTwo	Varchar	255	N	N	Second team playing against the first	
Year	Int	-	N	N	Year in which the match was held	

Score

Attribute	Type	Size	Null	Primary Key	Description	Other Constraints
ScoreId	Char	8	N	Y	Scores Id	
TeamOneScore	Char	10	N	N	Team one Score	
TeamTwoScore	Char	10	N	N	Team Two Score	
Winner	Varchar	255	N	N	Country that won	
MId	Char	8	N	FK	Match Id	

Business Rules

Business Rules	Description
BR1	Only one match can be held in one stadium in one day
BR2	Only two teams can play in one match
BR3	There can only be one man of the match
BR4	There will one T20 season for every two years
BR5	There will only be one team from each country
BR6	Each team has one innings with 20 overs

3. ASSUMPTIONS MADE

I did not make any assumptions to build the following database as it was not necessary, all the factual information needed for me to build the database was available thus I no assumptions were made.

IMPLEMENTATION OF THE DATABASE AND ADDING SAMPLE DATA

I used www.kaggle.com to find various data sets on international cricket tournaments, I was specifically searching for a dataset containing details about the T20 world cup series, I came across the following dataset https://www.kaggle.com/datasets/gauravarora1091/t20-world-cups20072021 which contained details about T20 matches that have been held from the year 2007 to the year 2021. Creating the data description in the earlier tasks provided me with a sketch to build my tables within the database. I then took the sample csv files from the link mentioned about and created a separate csv file named "Dataset.csv" containing only the information I needed; which were the details of the semi final and final matches held in every series throughout the years.

After building the csv data file with the necessary information, I continued on with the SQL commands to create the database, to build the tables within the database and to add values to each one of them; the commands are within the 'TableCommands.sql' file and the "ValueCommands.sql" file.

I wrote all the commands needed to build the database within the files creates above and used the SOURCE command in MySQL to build the tables and insert values to it.

USE OF DATABASE

1. DESIGN AND IMPLEMENTATION OF QUERIES

For the designing and implementation of queries, I scanned across my tables and attributes to find questions connecting entities together. Since the assignment required of us to demonstrate queries with basic SELECT statements with string comparison and other basic functionalities and to display the use of joins and sub-queries with GROUP BY and ORDER BY functions, I came up with the following questions to cater to all of the requirements.

-Q1: Obtain the teams that played in the year 2016

```
mysql> SELECT TeamOne, TeamTwo, Year,Type FROM MatchDetails WHERE Year= 2016 ;
+-------------+-------------+------+----------------+
| TeamOne     | TeamTwo     | Year | Type           |
+-------------+-------------+------+----------------+
| England     | New Zealand | 2016 | 1st Semi Final |
| West Indies | India       | 2016 | 2nd Semi Final |
| England     | West Indies | 2016 | Final          |
+-------------+-------------+------+----------------+
3 rows in set (0.00 sec)
```

--Q2: Select Venue Name and Year when team India played

```
mysql> SELECT VenueName, year FROM MatchDetails WHERE TeamOne = 'India' OR TeamTwo = 'India';
+------------------------------+------+
| VenueName                    | year |
+------------------------------+------+
| Kingsmead                    | 2007 |
| The Wanderers Stadium        | 2007 |
| Shere Bangla National Stadium | 2014 |
| Shere Bangla National Stadium | 2014 |
| Wankhede Stadium             | 2016 |
+------------------------------+------+
5 rows in set (0.00 sec)
```

--Q3: Order the best players of the match by descending player names and display the country that won the match

```
mysql> SELECT p.playerId, p.playerName,s.Winner FROM Players p NATURAL JOIN Score s
    ->  WHERE p.playerId = s.scoreId  GROUP BY playerId  ORDER BY playerName DESC;
+----------+--------------------+-------------+
| playerId | playerName         | Winner      |
+----------+--------------------+-------------+
| A002     | Yuvraj Singh       | India       |
| A014     | Virat Kohli        | India       |
| A001     | Umar Gul           | Pakistan    |
| A005     | Tilakaratne Dilshan | Sri Lanka   |
| A007     | Stuart Broad       | England     |
| A004     | Shahid Afridi      | Pakistan    |
| A006     | Shahid Afridi      | Pakistan    |
| A021     | Mitchell Marsh     | Australia   |
| A008     | Michael Hussey     | Australia   |
| A020     | Mathew Wade        | Australia   |
| A012     | Marlon Samuels     | West Indies |
| A018     | Marlon Samuels     | West Indies |
| A010     | Mahela Jayawardene | Sri Lanka   |
| A017     | Lendl Simmons      | West Indies |
| A015     | Kumar Sangakkara   | Sri Lanka   |
| A016     | Jason Roy          | England     |
| A003     | Irfan Pathan       | India       |
| A019     | Daryl Mitchell     | New Zealand |
| A009     | Craig Kieswetter   | England     |
| A011     | Chris Gayle        | West Indies |
| A013     | Angelo Mathews     | Sri Lanka   |
+----------+--------------------+-------------+
21 rows in set (0.00 sec)
```

--Q4: Display number of matches Sri Lanka played in Finals

```
mysql> SELECT COUNT(MId) AS Number_of_matches_SL_Played_in_Finals FROM MatchDetails
    -> WHERE TeamOne= 'Sri Lanka' OR TeamTwo = 'Sri Lanka' AND Type = 'Final';
+---------------------------------------+
| Number_of_matches_SL_Played_in_Finals |
+---------------------------------------+
|                                     6 |
+---------------------------------------+
1 row in set (0.00 sec)
```

--Q5: Select the best players from West Indies

```
mysql> SELECT * FROM Players WHERE TeamCountry = 'West Indies';
+----------+----------------+-------------+
| playerId | playerName     | TeamCountry |
+----------+----------------+-------------+
| A011     | Chris Gayle    | West Indies |
| A012     | Marlon Samuels | West Indies |
| A017     | Lendl Simmons  | West Indies |
| A018     | Marlon Samuels | West Indies |
+----------+----------------+-------------+
4 rows in set (0.02 sec)
```

--Q6: Select the Winner, Scores and Venue Where Team One Scored more than Team Two in the 1st Semi Final

```
mysql> SELECT Distinct S.Winner, S.TeamOneScore, S.TeamTwoScore, v.VenueName
    ->  FROM Score S RIGHT OUTER JOIN MatchDetails v ON S.TeamOneScore > S.TeamTwoScore WHERE v.Type = '1st Semi Final';
+-------------+--------------+--------------+-------------------------------------+
| Winner      | TeamOneScore | TeamTwoScore | VenueName                           |
+-------------+--------------+--------------+-------------------------------------+
| Australia   | 173/2        | 172/4        | Newlands                            |
| Australia   | 177/5        | 176/4        | Newlands                            |
| New Zealand | 167/5        | 166/4        | Newlands                            |
| West Indies | 161/6        | 155/9        | Newlands                            |
| West Indies | 196/3        | 192/2        | Newlands                            |
| England     | 159/3        | 153/8        | Newlands                            |
| Sri Lanka   | 134/4        | 130/4        | Newlands                            |
| India       | 176/4        | 172/4        | Newlands                            |
| West Indies | 137/6        | 101          | Newlands                            |
| West Indies | 205/4        | 131          | Newlands                            |
| Sri Lanka   | 139/4        | 123/7        | Newlands                            |
| England     | 148/3        | 147/6        | Newlands                            |
| Australia   | 197/7        | 191/6        | Newlands                            |
| England     | 132/3        | 128/6        | Newlands                            |
| Sri Lanka   | 158/5        | 101          | Newlands                            |
| Pakistan    | 149/4        | 142/5        | Newlands                            |
| India       | 157/5        | 152          | Newlands                            |
| India       | 188/5        | 173/7        | Newlands                            |
| Pakistan    | 147/4        | 143/8        | Newlands                            |
| Australia   | 173/2        | 172/4        | Trent Bridge                        |
| Australia   | 177/5        | 176/4        | Trent Bridge                        |
| New Zealand | 167/5        | 166/4        | Trent Bridge                        |
| West Indies | 161/6        | 155/9        | Trent Bridge                        |
| West Indies | 196/3        | 192/2        | Trent Bridge                        |
| England     | 159/3        | 153/8        | Trent Bridge                        |
| Sri Lanka   | 134/4        | 130/4        | Trent Bridge                        |
| India       | 176/4        | 172/4        | Trent Bridge                        |
| West Indies | 137/6        | 101          | Trent Bridge                        |
| West Indies | 205/4        | 131          | Trent Bridge                        |
| Sri Lanka   | 139/4        | 123/7        | Trent Bridge                        |
| England     | 148/3        | 147/6        | Trent Bridge                        |
| Australia   | 197/7        | 191/6        | Trent Bridge                        |
| England     | 132/3        | 128/6        | Trent Bridge                        |
| Sri Lanka   | 158/5        | 101          | Trent Bridge                        |
| Pakistan    | 149/4        | 142/5        | Trent Bridge                        |
| India       | 157/5        | 152          | Trent Bridge                        |
| India       | 188/5        | 173/7        | Trent Bridge                        |
| Pakistan    | 147/4        | 143/8        | Trent Bridge                        |
| Australia   | 173/2        | 172/4        | Daren Sammy National Cricket Stadium |
| Australia   | 177/5        | 176/4        | Daren Sammy National Cricket Stadium |
| New Zealand | 167/5        | 166/4        | Daren Sammy National Cricket Stadium |
| West Indies | 161/6        | 155/9        | Daren Sammy National Cricket Stadium |
```

--Q7: Select match details and scores for Finals and order by year

```
mysql> SELECT s.TeamOne, s1.TeamOneScore, s.TeamTwo, s1.TeamTwoScore, s.Year, s.Type FROM MatchDetails s
    -> LEFT OUTER JOIN Score s1 ON s.MId = s1.scoreId WHERE s.Type LIKE'F%' ORDER BY s.Year;
+-------------+--------------+-------------+--------------+------+-------+
| TeamOne     | TeamOneScore | TeamTwo     | TeamTwoScore | Year | Type  |
+-------------+--------------+-------------+--------------+------+-------+
| India       | 157/5        | Pakistan    | 152          | 2007 | Final |
| Pakistan    | 138/6        | Sri Lanka   | 139/2        | 2009 | Final |
| Australia   | 148/3        | England     | 147/6        | 2010 | Final |
| Sri Lanka   | 137/6        | West Indies | 101          | 2012 | Final |
| India       | 134/4        | Sri Lanka   | 130/4        | 2014 | Final |
| England     | 161/6        | West Indies | 155/9        | 2016 | Final |
| New Zealand | 173/2        | Australia   | 172/4        | 2021 | Final |
+-------------+--------------+-------------+--------------+------+-------+
7 rows in set (0.01 sec)
```

--Q8: Select man of the match for each winning team and order by ascending order of the names

```
mysql> SELECT v.playerName AS Man_of_the_match, s.Winner FROM Players v INNER JOIN Score s
    ->  ON v.playerId = s.scoreId  ORDER BY v.playerName ASC;
+---------------------+-------------+
| Man_of_the_match    | Winner      |
+---------------------+-------------+
| Angelo Mathews      | Sri Lanka   |
| Chris Gayle         | West Indies |
| Craig Kieswetter    | England     |
| Daryl Mitchell      | New Zealand |
| Irfan Pathan        | India       |
| Jason Roy           | England     |
| Kumar Sangakkara    | Sri Lanka   |
| Lendl Simmons       | West Indies |
| Mahela Jayawardene  | Sri Lanka   |
| Marlon Samuels      | West Indies |
| Marlon Samuels      | West Indies |
| Mathew Wade         | Australia   |
| Michael Hussey      | Australia   |
| Mitchell Marsh      | Australia   |
| Shahid Afridi       | Pakistan    |
| Shahid Afridi       | Pakistan    |
| Stuart Broad        | England     |
| Tilakaratne Dilshan | Sri Lanka   |
| Umar Gul            | Pakistan    |
| Virat Kohli         | India       |
| Yuvraj Singh        | India       |
+---------------------+-------------+
21 rows in set (0.00 sec)
```

--Q9: Display venues where more than the average matches have been played

```
mysql> SELECT A.VenueName FROM MatchDetails A  WHERE A.Year > ALL(SELECT AVG(Year) FROM MatchDetails);
+-----------------------------------+
| VenueName                         |
+-----------------------------------+
| Shere Bangla National Stadium     |
| Shere Bangla National Stadium     |
| Shere Bangla National Stadium     |
| Arun Jaitley Stadium              |
| Wankhede Stadium                  |
| Eden Gardens                      |
| Sheikh Zayed Stadium              |
| Dubai International Cricket Stadium |
| Dubai International Cricket Stadium |
+-----------------------------------+
9 rows in set (0.01 sec)
```

2. DESIGN AND IMPLEMENTATION OF ADVANCE FEATURES

The following task required the implementation of any two advanced features. I created multiple uses of **View** and **Procedure** features and created indexes for two of the tables names **Players** and **Team.** Sample outputs for all of the features have been attached below.

Use of Views

--Creating a view to display final match details over the years

```
mysql> CREATE VIEW Final AS SELECT s.TeamOne, s1.TeamOneScore, s.TeamTwo, s1.TeamTwoScore
Y s.Year;
Query OK, 0 rows affected (0.01 sec)

mysql> SELECT * FROM Final;
+-------------+--------------+-------------+--------------+------+-------+
| TeamOne     | TeamOneScore | TeamTwo     | TeamTwoScore | Year | Type  |
+-------------+--------------+-------------+--------------+------+-------+
| India       | 157/5        | Pakistan    | 152          | 2007 | Final |
| Pakistan    | 138/6        | Sri Lanka   | 139/2        | 2009 | Final |
| Australia   | 148/3        | England     | 147/6        | 2010 | Final |
| Sri Lanka   | 137/6        | West Indies | 101          | 2012 | Final |
| India       | 134/4        | Sri Lanka   | 130/4        | 2014 | Final |
| England     | 161/6        | West Indies | 155/9        | 2016 | Final |
| New Zealand | 173/2        | Australia   | 172/4        | 2021 | Final |
+-------------+--------------+-------------+--------------+------+-------+
7 rows in set (0.00 sec)
```

-- View to display the best players of the Final matches held over the years

```
mysql> SELECT * FROM Best_player_of_the_match;
+------------------+------+
| playerName       | Year |
+------------------+------+
| Irfan Pathan     | 2007 |
| Shahid Afridi    | 2009 |
| Craig Kieswetter | 2010 |
| Marlon Samuels   | 2012 |
| Kumar Sangakkara | 2014 |
| Marlon Samuels   | 2016 |
| Mitchell Marsh   | 2021 |
+------------------+------+
7 rows in set (0.00 sec)
```

--Create a view to display the venue details and years when Sri Lanka played in the semifinals or finals

```
mysql> CREATE VIEW Sl_Matches AS SELECT p.VenueName,p.VenueLocation, s.Year, s.Type FROM MatchDetails s
    -> RIGHT OUTER JOIN Venue p ON p.VenueName= s.VenueName WHERE s.TeamOne = 'Sri Lanka' OR s.TeamTwo = 'Sri Lanka';
Query OK, 0 rows affected (0.06 sec)

mysql> SELECT * FROM Sl_Matches;
+-------------------------------------+---------------+------+---------------+
| VenueName                           | VenueLocation | Year | Type          |
+-------------------------------------+---------------+------+---------------+
| Kennington Oval                     | London        | 2009 | 2nd Semi Final |
| Lords                               | London        | 2009 | Final         |
| Daren Sammy National Cricket Stadium | St Lucia      | 2010 | 1st Semi Final |
| R.Premadasa Stadium                 | Colombo       | 2012 | 1st Semi Final |
| R.Premadasa Stadium                 | Colombo       | 2012 | Final         |
| Shere Bangla National Stadium       | Dhaka         | 2014 | 1st Semi Final |
| Shere Bangla National Stadium       | Dhaka         | 2014 | Final         |
+-------------------------------------+---------------+------+---------------+
```

-- Create a view to display the first semifinal matches

```
mysql> CREATE VIEW SemiFinals AS SELECT s.TeamOne, s.TeamTwo, s.Year,s.VenueName
    -> FROM MatchDetails s  LEFT OUTER JOIN Venue m ON s.VenueName = m.VenueName WHERE s.Type = '1st Semi Final' ORDER BY s.Year;
Query OK, 0 rows affected (0.00 sec)

mysql> SELECT * FROM SemiFinals;
+-------------+-------------+------+-------------------------------------+
| TeamOne     | TeamTwo     | Year | VenueName                           |
+-------------+-------------+------+-------------------------------------+
| New Zealand | Pakistan    | 2007 | Newlands                            |
| Pakistan    | South Africa | 2009 | Trent Bridge                        |
| England     | Sri Lanka   | 2010 | Daren Sammy National Cricket Stadium |
| Sri Lanka   | Pakistan    | 2012 | R.Premadasa Stadium                 |
| Sri Lanka   | West Indies | 2014 | Shere Bangla National Stadium       |
| England     | New Zealand | 2016 | Arun Jaitley Stadium                |
| England     | New Zealand | 2021 | Sheikh Zayed Stadium                |
+-------------+-------------+------+-------------------------------------+
7 rows in set (0.00 sec)
```

Creating Procedures

--Create procedure to add a new team to table Team

```
mysql> CREATE PROCEDURE newTeam(
    -> e VARCHAR(255)
    -> )
    -> COMMENT 'Insert new Team to table Team'
    -> INSERT INTO Team(TeamCountry)
    -> VALUES(e);
Query OK, 0 rows affected (0.14 sec)

mysql> CALL newTeam('Bangladesh');
Query OK, 1 row affected (0.05 sec)

mysql> SELECT * FROM Team;
+--------------+
| TeamCountry  |
+--------------+
| Australia    |
| Bangladesh   |
| England      |
| India        |
| New Zealand  |
| Pakistan     |
| South Africa |
| Sri Lanka    |
| West Indies  |
+--------------+
9 rows in set (0.00 sec)
```

-- Create procedure to add a new venue to table Venue

```
mysql> CREATE PROCEDURE newVenue(
    -> v VARCHAR(255),
    -> vv VARCHAR(255)
    -> )
    -> COMMENT 'Insert new Venue to table Venue'
    -> INSERT INTO Venue(VenueName, VenueLocation)
    -> VALUES(v, vv);
Query OK, 0 rows affected (0.02 sec)

mysql> CALL newVenue('TestVenue', 'TestLocation');
Query OK, 1 row affected (0.04 sec)

mysql> SELECT * FROM Venue;
+-------------------------------------+---------------+
| VenueName                           | VenueLocation |
+-------------------------------------+---------------+
| Arun Jaitley Stadium                | Delhi         |
| Daren Sammy National Cricket Stadium | St Lucia      |
| Dubai International Cricket Stadium | Dubai         |
| Eden Gardens                        | Kolkata       |
| Kennington Oval                     | London        |
| Kensington Oval                     | Barbados      |
| Kingsmead                           | Durban        |
| Kingsmeaf                           | Durban        |
| Lords                               | London        |
| Newlands                            | Cape Town     |
| R.Premadasa Stadium                 | Colombo       |
| Sheikh Zayed Stadium                | Abu Dhabi     |
| Shere Bangla National Stadium       | Dhaka         |
| TestVenue                           | TestLocation  |
| The Wanderers Stadium               | Johannesburg  |
| Trent Bridge                        | Nottingham    |
| Wankhede Stadium                    | Mumbai        |
+-------------------------------------+---------------+
17 rows in set (0.01 sec)
```

Creating Indexes

I created to indexes for playerName attribute in table Players and TeamCountry attribute in table Team

```
mysql> CREATE INDEX PlayerInd ON Players(playerName);
Query OK, 0 rows affected (0.43 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> CREATE INDEX TeamInd ON Team(TeamCountry);
Query OK, 0 rows affected (0.11 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

3. DATABASE CONNECTIVITY AND PYTHON IMPLEMENTATION

I connected my database to python3 and called my previously defined queries via python and displayed all my outputs.
Below attached image consists of the part of the code written and the output after running the python code for the displayed code. I have written all the nine queries that were implemented earlier in python and I am displaying outputs to the user via the print function. After running all the queries, I close the connection to the database and the cursor created.

```
#Python commands for part 3 queries


import mysql.connector

#Connecting to the database
mydb = mysql.connector.connect(
  host="localhost",
  user="root",
  password="Nethmi20030127",
  database="Cricket_20688651"
)


#Creating the cursor
mycursor = mydb.cursor()


#Query One to Obtain teams that played in year 2016
select_one = "SELECT TeamOne, TeamTwo, Year,Type FROM MatchDetails WHERE Year= 2016"

mycursor.execute(select_one)

myresult = mycursor.fetchall()

print()
print("Obtain the teams that played in the year 2016")
print()

for x in myresult:
  print(x)

#Query Two to select venue name and year when team India played
sql = "SELECT VenueName, year FROM MatchDetails WHERE TeamOne = 'India' OR TeamTwo = 'India';"

mycursor.execute(sql)

myresult_2 = mycursor.fetchall()

print()
print("Select Venue Name and Year when team India played")
print()

for x in myresult_2:
  print(x)

```

```
147 #Query Nine to display the venues where most of the matches have been played
148 sqle = "SELECT A.VenueName FROM MatchDetails A  WHERE A.Year > ALL(SELECT AVG(Year) FROM MatchDetails);"
149
150 mycursor.execute(sqle)
151
152 myresult_9 = mycursor.fetchall()
153
154
155 print()
156 print("Display venues where most of the matches have been played")
157 print()
158
159 for x in myresult_9:
160   print(x)
161
162
163 #Close cursor
164 mycursor.close()
165 #Close connection to database
166 mydb.close()
167
```

Output:

```
nslv@nslv-virtual-machine:~/Cyber/CyberFinal$ python3 PythonConnection.py

Obtain the teams that played in the year 2016

('England', 'New Zealand', 2016, '1st Semi Final')
('West Indies', 'India', 2016, '2nd Semi Final')
('England', 'West Indies', 2016, 'Final')

Select Venue Name and Year when team India played

('Kingsmead', 2007)
('The Wanderers Stadium', 2007)
('Shere Bangla National Stadium', 2014)
('Shere Bangla National Stadium', 2014)
('Wankhede Stadium', 2016)

Order the best players of the match by descending player names and display the country that won the match

('A002', 'Yuvraj Singh', 'India')
('A014', 'Virat Kohli', 'India')
('A001', 'Umar Gul', 'Pakistan')
('A005', 'Tilakaratne Dilshan', 'Sri Lanka')
('A007', 'Stuart Broad', 'England')
('A004', 'Shahid Afridi', 'Pakistan')
('A006', 'Shahid Afridi', 'Pakistan')
('A021', 'Mitchell Marsh', 'Australia')
('A008', 'Michael Hussey', 'Australia')
('A020', 'Mathew Wade', 'Australia')
('A012', 'Marlon Samuels', 'West Indies')
('A018', 'Marlon Samuels', 'West Indies')
('A010', 'Mahela Jayawardene', 'Sri Lanka')
('A017', 'Lendl Simmons', 'West Indies')
('A015', 'Kumar Sangakkara', 'Sri Lanka')
('A016', 'Jason Roy', 'England')
('A003', 'Irfan Pathan', 'India')
('A019', 'Daryl Mitchell', 'New Zealand')
('A009', 'Craig Kieswetter', 'England')
('A011', 'Chris Gayle', 'West Indies')
('A013', 'Angelo Mathews', 'Sri Lanka')

Display number of matches Sri Lanka played in Finals

(6,)

Select the best players from West Indies
```

DISSCUSSION – REFLECTION ON MY WORK

I have successfully completed all the tasks mentioned within the assessment requirements.

I was able to complete most of the tasks with ease due to the practice that I got from the tutorials and the practical exams that were conducted.

Initially it was a bit challenging to find a dataset containing all the necessary information to complete my desired database and the information that I wanted to present; but Kaggle had a famous T20 dataset that came to my rescue, from there onwards I was able to complete the tasks easily.

I found displaying how I implemented the relational schema a bit challenging as I did not want it to look messy and confusing, therefore I wrote down the basic relational schema work and then displayed each table with their data descriptions after relational schema.

I could improve my work with the use of other advanced functionalities such as triggers, I mainly focused on only three functionalities which was view, procedure and indexes adding more functionalities could improve my work.

My database consists of the basic information of the T20 semi final and final matches, I would like to present more data such as players in each team, team captains, toss winners and information about all the other matches that were held per series through the years.

I added sufficient sample data to build my database and didn't include the above mentioned details to maintain the simplicity of the database; which I think was a good achievement.

REFERENCES

https://www.kaggle.com/datasets/gauravarora1091/t20-world-cups20072021

https://www.w3schools.com/python/python_mysql_getstarted.asp