EXPLANATION OF PROGRAM

Sri Aditya Panda (UIN: 223003437)
Arjun Jayaraj Moothedath (UIN: 722008073)
Dakshina Ilangovan (UIN: 622009678)
Rajashree Rao Polsani (UIN: 223001584)

How to run the code :

linux2.cs.tamu.edu :
Put mysql-connector-java-5.1.34-bin.jar along with the program file submitted.
Change database connection information in DBConnection class of the submitted program file.
compile the file : javac database_part4.java
run the file : java -cp .:mysql-connector-java-5.1.34-bin.jar database_part4

Change database connection information :

In DBConnection class change url, dbname, username and password accordingly.

Insert (Add new world cup year):

This functionality allows user to set up information for a new world cup. The user can add any additional countries that are not in list of countries maintained by team table. The user is then prompted to add new world cup year along with host country, winner and runner up for that year. Note that winner and runner up should belong to list of countries maintained in team table.

Two insert SQL Queries:
insert into team (Country_Code, Country_Name,Association, Points, Ranking)
values ('India'+'IND'+'asia'+97+0);

insert into world_cup values (2018, 'Pakisthan' ,'BR', 'IND');

Output :

// First we choose the host country
Choose the first alphabet of the desired host country
a
b
c
d
e
f
g
h
i

j
k
m
n
p
r
s
t
u
w
y
z
p
1.peru
2.poland
3.portugal
4.paraguay
Choose index number of desired country else type -1 and enter a new name
-1
pakisthan

// Then we choose the runner up country. As India is not in the team table, we first inserted into teams table
Choose the first alphabet of the runner up country
a
b
c
d
e
f
g
h
i
j
k
m
n
p
r
s
t
u
w
y
z
i

1.ireland
2.israel
3.iraq
4.iran
5.italy
Choose index number of desired country else type -999 and enter a new name
-999
india
Enter the association
asia
Enter the country code
ind
Enter ranking
89
Enter points
0
Insert of runner up country successfully executed
// Then we choose winner country, as it is in the team table we do not do any insertions
Choose the first alphabet of the winning country
a
b
c
d
e
f
g
h
i
j
k
m
n
p
r
s
t
u
w
y
z
b
1.bosnia herzegovina
2.belgium
3.bulgaria
4.bolivia
5.brazil

Choose index number of desired country else type -999 and enter a new name
5
Chosen country:brazil
// Finally we enter a new tuple in world_cup table
Enter the year for which worldcup details are to be entered
2018
Insert into world cup successfully executed.

Delete (Delete Poor Performers):
We identify countries that have recorded 0 points so far from the data. For each of these countries, we identify number of world cups it participated in after a year as provided by the user. We eliminate all countries that have participated in less than average number of participations by each country after that year.

```
delete from team
where Country_Code in
        (
                //project the countries eligible for deletion
                select Country_Code from
                        (
                                //check if a country has lesser value than average value
                                select Country_Code from team natural join
                                team_participates_in_world_cup
                                where Points=0 and Year>=1950
                                group by Country_Name
                                having count(*)<=
                                        (
                                                //find average value for all countries
                                                select avg(c) from
                                                (
                                                        //find numbers of years each country
                                                        //participated after selected year
                                                        select count(*) as c from team natural
                                                        join team_participates_in_world_cup
                                                        where Points=0 and Year>=1950
                                                        group by Country_Name
                                                )participation_statistics
                                        )
                        )country_list
        )
```

Output:

```
Enter the year beyond which you want participations to be considered. Please
restrict between 1930 and 2014
1930
1 Teams with points 0 that had below average participation after 1930 have
been deleted.
```

execute (Ranking based on the teams):

executeUpdate Function

- This is a wrapper function which is called from the main menu function. This function further asks the user for sub choices for the update query (which is to update the rankings of the teams based on the number of goals they have scored throughout all world cups). The user gets to choose the tie breaker condition in case the number of goals are the same. The executeUpdate function then calls the executeUpdateQuery function which takes as argument the tie breaker choice of the user.

executeUpdateQuery Function

- This function first computes the number of goals scored by each team across all world cups from the goal_and_player_scores_goals table. The select query is shown here:

```
SELECT COUNT(*) AS Goals_Scored, Country_Code
FROM goal_and_player_scores_goals
GROUP BY Country_Code
ORDER BY Goals_Scored DESC
```

- This will give us the count of goals scored by each team. Additionally, we find out the teams which have not scored so far in the World Cups as well. A map **goalCountryMap** is maintained which maps the goals scored to a list of countries who have scored those many goals. The ranks of the countries are maintained in a map called **rankMap**.

- The goalCountryMap is iterated and if it is found that more than one country has scored a specific number of goals, the tie breaker condition is invoked. These are explained below:

    - **Tie breaker condition #1**

      Teams with higher ranking previously are given precedence in case of a tie. This can be done easily with the following select query:

```
SELECT Country_Code
FROM team
WHERE Country_Code IN " +cList +
ORDER BY Ranking, Points DESC
```

      Where cList is the list of countries with the same number of goals.

    - **Tie breaker condition #2**

Teams with higher world cup participation is given lower precedence (Idea is that a team with higher average gets a higher rank)

This is done with the following select query:

SELECT COUNT(*) AS Times_Participated, Country_Code

FROM team_participates_in_world_cup

WHERE Country_Code IN " +cList1 +

GROUP BY Country_Code

ORDER BY Times_Participated

Where cList1 is the list of countries with the same number of goals.

- **Tie breaker condition #3**

  Teams with more number of world cup wins is given precedence

  SELECT count(*) AS Matches_Won, Winner

  FROM (SELECT * FROM matches WHERE Winner != 'NUL' AND Winner IN "+cList2+") DecidedMatches

  GROUP BY Winner

  ORDER BY Matches_Won DESC

  Where cList2 is the list of countries with the same number of goals

- The rankMap map gets filled after checking appropriate tie breaker conditions. This map is used when finally updating the country rank. The query is as shown. (It is repeated for each entry in the rankMap)

  UPDATE team
  SET Ranking = " +entry.getKey()+
  WHERE Country_Code = '" +entry.getValue()

Select 1(Matches a country A won against country B):

```
This query is to find the the number of Matches country A won against country
B. User enters both the country names. User has to choose whether he wants
the results for a particular year or whether he wants for a particular
stadium. Results show the number of matches team A won straightly (without
penalties), matches won via penalty, matches that resulted in draw against B.

For example number of matches brazil won against Argentina when year is
selected by user

// Getting list of years in which both the countries have participated
select distinct(Date_Year) temp
```

```
from matches
where (Team_1 = (select Country_Code
                 from team
                 where Country_Name = ‘brazil’)
                and
      Team_2 = (select Country_Code
                from team
                where Country_Name = 'argentina'))
      or (
      Team_1 = (select Country_Code
                 from team
                 where Country_Name ='argentina')
                 and
      Team_2 = (select Country_Code
                from team
                where Country_Name ='brazil'));


// Once the user selects option the following queries are executed

// This query gives number of matches won straightly and number of matches
won via penalty

select sum(case when Decision = 'WINNER' then 1 else 0 end) WinTotal,
      sum(case when Decision = 'PENALTY' then 1 else 0 end) PenaltyTotal
from matches
where (Winner = (select Country_Code
                 from team
                 where Country_Name ='brazil'))
                 and
      (Team_1 = (select Country_Code
                 from team
                 where Country_Name ='argentina')
      or
      Team_2 = (select Country_Code
                from team
                 where Country_Name ='argentina'))
      and
      Date_Year = 1972;

// This query gives number of matches that resulted in draw

select sum(case when Decision = 'WINNER' then 1 else 0 end) DrawTotal,
from matches
where (Winner = (select Country_Code
                 from team
                 where Country_Name ='brazil'))
                 and
      (Team_1 = (select Country_Code
                 from team
                 where Country_Name ='argentina')
      or
      Team_2 = (select Country_Code
                from team
                 where Country_Name ='argentina'))
      and
```

```
      Date_Year = 1974;

Output:
Option 4 selected
Choose the winning team
Choose the first alphabet of the desired winning country
a
b
c
d
e
f
g
h
i
j
k
m
n
p
r
s
t
u
w
y
z
b
1.bosnia herzegovina
2.belgium
3.bulgaria
4.bolivia
5.brazil
Choose index number of desired country
5
Chosen country:brazil
Choose the loosing team
Choose the first alphabet of the desired loosing country
a
b
c
d
e
f
g
h
i
j
k
m
n
p
r
s
t
u
```

```
w
y
z
a
1.angola
2.argentina
3.austria
4.australia
5.algeria
Choose index number of desired country
2
Chosen country:argentina
Choose one of the filtering parameter (Enter the number associated with it):
1. Filter by year
2. Filter by Stadium
1
Choose one of the index corresponding to the year you are interested in
1.1990
2.1974
3.1978
4.1982
Number of matches brazil won against argentina without penalties : 1
Number of matches brazil won against argentina with penalties: 0
Number of matches brazil drew against argentina : 0


//Number of matches brazil won against Argentina when stadium is selected by
user.

// Getting list of stadiums where both the countries have participated
select distinct(Stadium) temp
from matches
where (Team_1 = (select Country_Code
                 from team
                 where Country_Name = 'brazil')
                and
      Team_2 = (select Country_Code
                from team
                where Country_Name = 'argentina'))
      or (
      Team_1 = (select Country_Code
                from team
                where Country_Name ='argentina')
                and
      Team_2 = (select Country_Code
                from team
                where Country_Name ='brazil'));


// Once the user selects option the following queries are executed

// This query gives number of matches won straightly and number of matches
won via penalty

select sum(case when Decision = 'WINNER' then 1 else 0 end) WinTotal,
```

```
      sum(case when Decision = 'PENALTY' then 1 else 0 end) PenaltyTotal
from matches
where (Winner = (select Country_Code
                 from team
                 where Country_Name ='brazil'))
                 and
      (Team_1 = (select Country_Code
                 from team
                 where Country_Name ='argentina')
      or
      Team_2 = (select Country_Code
                from team
                 where Country_Name ='argentina'))
      and
      Date_Year = 1972;

// This query gives number of matches that resulted in draw

select sum(case when Decision = 'WINNER' then 1 else 0 end) DrawTotal,
from matches
where (Winner = (select Country_Code
                 from team
                 where Country_Name ='brazil'))
                 and
      (Team_1 = (select Country_Code
                 from team
                 where Country_Name ='argentina')
      or
      Team_2 = (select Country_Code
                from team
                 where Country_Name ='argentina'))
      and
      Date_Year = 1972;

Output :
Choose one of the index corresponding to the stadium you are interested in
1. stadio delle alpi
2. niedersachsenstadion
3. estadio gigante de arroyito
4. estadio sarriá
2
Number of matches brazil won against argentina without penalties : 1
Number of matches brazil won against argentina with penaties: 0
Number of matches brazil drew against argentina : 0
```

Select 2 (Select Elite Squad):

Set of all players of a country who played in at least two world cup years the country won the world cup. We obtain the country name from user prompt and return results to the user. If a particular country did not win in at least two world cups or have no player who played in at least two winning world cups, no results are returned.

select Player_Name from world_cup_played_by_player natural join team

```
where lower(Country_Name)='brazil'
and Year in      (
                        //find winning years of the country
                        select Year from world_cup, team
                        where lower(team.Country_Name)='brazil'
                        and world_cup.Winner=team.Country_Code
                )
//check if player played in atleast 2 winning years
group by Player_Name, Country_Code having count(*)>=2;
```

Output:

```
Choose the first alphabet of the desired country
a
b
c
d
e
f
g
h
i
j
k
m
n
p
r
s
t
u
w
b
1.belgium
2.bulgaria
3.bolivia
4.brazil
Choose index number of desired country
4
Chosen country:brazil
Printing 4 rows from table world_cup_played_by_player,
+-------------+
| Player_Name |
+-------------+
| Dida        |
+-------------+
| Gilmar      |
+-------------+
| Pel         |
+-------------+
| Ronaldo     |
+-------------+
```

DBConnection class

This function attempts to connect to a database using the JDBC connector. The JDBC driver is initialized and first and a connection object is created by passing the Database URL, user name and password to the driver manager object. The relevant code is shown here:

```
Class.forName ("com.mysql.jdbc.Driver");

conn = DriverManager.getConnection (DBUrl, userName, password);
```

DBTablePrinter class

It is a helper class to print the results of queries in a table format.