

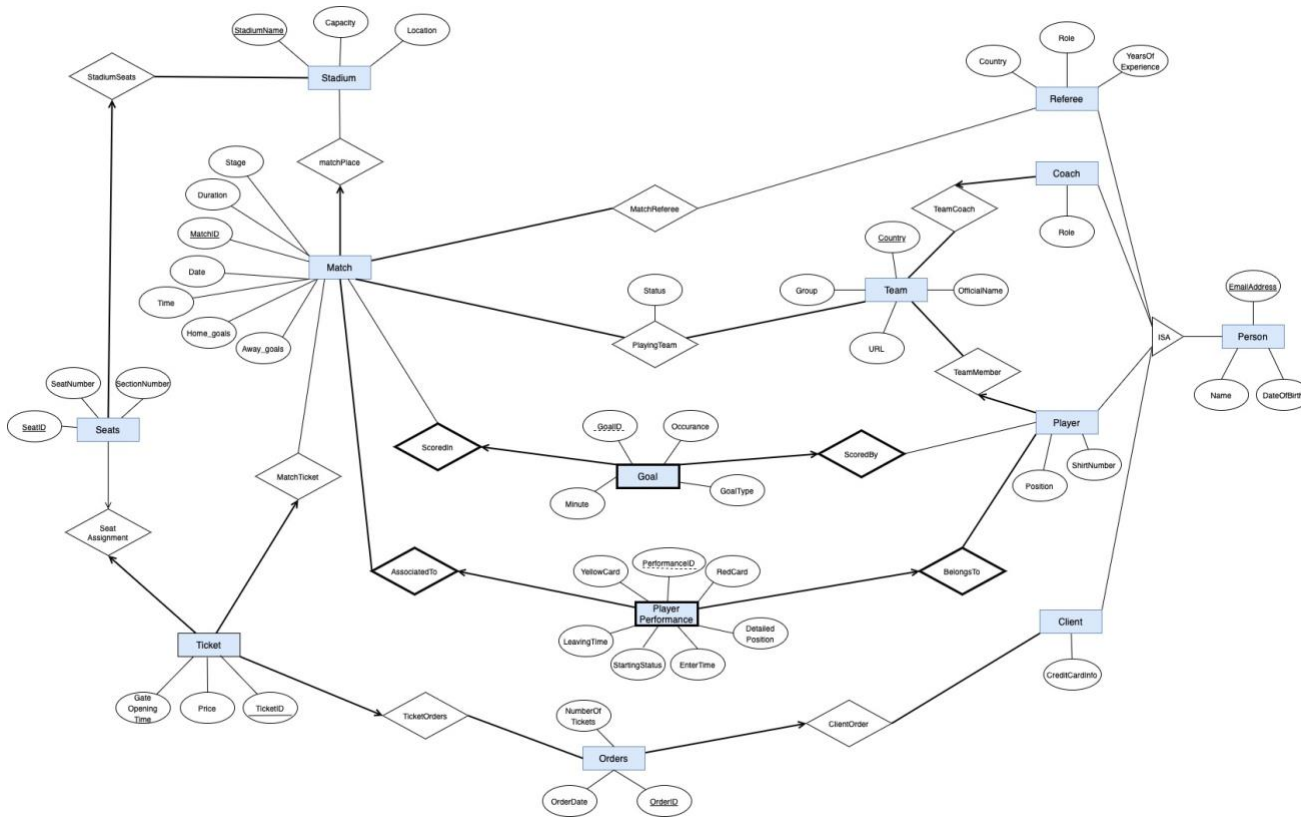
# COMP 421

Project 1-Group-46



## Relational Schema

We have also included the ER as a separate PDF in our submission since the quality in here is not high and display is very small.



## Application interaction

Part (a):

- i) **SELECT** pt1.matchid, pt1.country **AS** home\_team, pt2.country **AS** away\_team ,  
 match.time **AS** DATE, match.stage  
**FROM** playingteam **AS** pt1 **JOIN** playingteam **AS** pt2 **ON** pt1.matchid =  
 pt2.matchid, match  
**WHERE** pt1.status = 'Home' **AND** pt2.status = 'Away' **AND** match.matchid =  
 pt1.matchid;

```
cs421g46@winter2023-comp421:~/P2-G46$ cat q.sql
connect to cs421;

SELECT pt1.matchid, pt1.country AS home_team, pt2.country AS away_team , match.time AS DATE, match.stage
FROM playingteam AS pt1 JOIN playingteam AS pt2 ON pt1.matchid = pt2.matchid, match
WHERE pt1.status = 'Home' AND pt2.status = 'Away'AND match.matchid = pt1.matchid;
cs421g46@winter2023-comp421:~/P2-G46$ db2 -t -f q.sql

Database Connection Information

Database server          = DB2/LINUX8664 11.5.8.0
SQL authorization ID    = CS421G46
Local database alias    = CS421

MATCHID    HOME_TEAM    AWAY_TEAM    DATE    STAGE
-----
1 Argentina    Portugal    2023-03-10-10.00.00.000000 Group Stage
2 Canada    England    2023-03-11-13.00.00.000000 Group Stage
3 Belgium    Croatia    2023-03-12-16.00.00.000000 Group Stage
11 Germany    Netherlands    2023-03-14-10.00.00.000000 Group Stage
5 Germany    Argentina    2023-03-16-13.00.00.000000 Round of 16
6 Belgium    England    2023-03-17-16.00.00.000000 Round of 16
10 Germany    Portugal    2023-03-19-10.00.00.000000 Finals

7 record(s) selected.
```

ii)

```
cs421g46@winter2023-comp421:~/P3-G46$ java soccer
Connection Successful: com.ibm.db2.jcc.t4.b@5afa04c

Soccer Main Menu
1. List information of matches of a country
2. Insert initial player information for a match
3. Purchase a match ticket!
4. Exit application

Please Enter Your Option: 1

Please enter name of a participating country: Argentina

| Home Team | Away Team | Date and Time | Stage | Home Team Goals | Away Team Goals | Seats Sold |
| Argentina | Portugal | 2023-03-10 10:00:00.0 | Group Stage | 1 | 1 | 2 |
| Germany | Argentina | 2023-03-16 13:00:00.0 | Round of 16 | 2 | 0 | 7 |

Enter [A] to find matches of another country, [P] to go to the previous menu: █
```

iii)

```
[Enter [A] to find matches of another country, [P] to go to the previous menu: P

Soccer Main Menu
1. List information of matches of a country
2. Insert initial player information for a match
3. Purchase a match ticket!
4. Exit application

Please Enter Your Option: █
```

Part(b):

- i) **SELECT** pt1.matchid, pt1.country **AS** home\_team, pt2.country **AS** away\_team ,  
match.time **AS** DATE  
**FROM** playingteam **AS** pt1 **JOIN** playingteam **AS** pt2 **ON** pt1.matchid = pt2.matchid,  
match  
**WHERE** pt1.status = 'Home' **AND** pt2.status = 'Away' **AND** match.matchid =  
pt1.matchid **AND** match.time >= CURRENT\_TIMESTAMP **AND** match.time <=  
**ADD\_DAYS**(CURRENT\_TIMESTAMP,3);

```
cs421g46@winter2023-comp421:~/P2-G46$ cat q.sql
connect to cs421;

SELECT pt1.matchid, pt1.country AS home_team, pt2.country AS away_team , match.time AS DATE
FROM playingteam AS pt1 JOIN playingteam AS pt2 ON pt1.matchid = pt2.matchid, match
WHERE pt1.status = 'Home' AND pt2.status = 'Away' AND match.matchid = pt1.matchid AND match.time >= CURRENT_TIMESTAMP AND match.time <= ADD_DAYS(CURRENT_TIMESTAMP,3);
cs421g46@winter2023-comp421:~/P2-G46$ db2 -t -f q.sql

Database Connection Information

Database server      = DB2/LINUX8664 11.5.8.0
SQL authorization ID = CS421G46
Local database alias = CS421

MATCHID    HOME_TEAM    AWAY_TEAM    DATE
-----
        6 Belgium    England    2023-03-17-16.00.00.000000
        5 Germany    Argentina  2023-03-16-13.00.00.000000

2 record(s) selected.
```

- ii) We are very confused with the question since it was asked in the assignment to have some players chosen to be fixed for an upcoming match. And so, we have data entered in the PlayerPerformance table where the purpose of the table is to display the performance of the players that are going to play (are chosen to be one of the eleven fixed players) or have played in a match. Hence our table is not empty and displays a player(s).

```
cs421g46@winter2023-comp421:~/P2-G46$ cat q.sql
connect to cs421;

SELECT player.name
FROM player, playerperformance, teammember
WHERE playerperformance.startingstatus = 'starting XI' AND player.email
address = playerperformance.emailaddress and player.emailaddress = team
member.emailaddress AND teammember.country = 'Germany' AND playerperfor
mance.matchid = 5;
cs421g46@winter2023-comp421:~/P2-G46$ db2 -t -f q.sql

Database Connection Information

Database server      = DB2/LINUX8664 11.5.8.0
SQL authorization ID = CS421G46
Local database alias = CS421

NAME
-----
Leon Goretzka
Manual Neuer

2 record(s) selected.
```

iii)

```
[cs421g46@winter2023-comp421:~/P2-G46$ cat q.sql
connect to cs421;

SELECT Player.name, country
FROM teammember, player
WHERE country = 'Germany' AND player.emailaddress = teammember.emailaddress;
[cs421g46@winter2023-comp421:~/P2-G46$ db2 -t -f q.sql

Database Connection Information

Database server          = DB2/LINUX8664 11.5.8.0
SQL authorization ID    = CS421G46
Local database alias    = CS421

NAME                                COUNTRY
-----
Leon Goretzka                     Germany
Manual Neuer                       Germany
Thomas Muller                      Germany
Leroy Sane                         Germany

4 record(s) selected.
```

iv)

```
[cs421g46@winter2023-comp421:~/P3-G46$ java soccer
Connection Successful: com.ibm.db2.jcc.t4.b05afa04c

Soccer Main Menu
1. List information of matches of a country
2. Insert initial player information for a match
3. Purchase a match ticket!
4. Exit application

[Please Enter Your Option: 2

Matches in the coming 3 days:

| Match ID | Home Team | Away Team | Date and Time | Stage |
| 5 | Germany | Argentina | 2023-03-16 13:00:00.0 | Round of 16 |
| 6 | Belgium | England | 2023-03-17 16:00:00.0 | Round of 16 |

NOTE: To go to previous menu, press [P]
```

v)

```
NOTE: To go to previous menu, press [P]
[Please enter the match ID for which you wish to add players: 5

NOTE: To go to previous menu, press [P]
[Please enter the country for which you wish to add players: Germany

The following players from Germany are already entered for match 5:
```

vi)

```
NOTE: To go to previous menu, press [P]
[Please enter the country for which you wish to add players: Germany

The following players from Germany are already entered for match 5:
```

Player Name	Shirt Number	Detailed Position	From Minute	To Minute	Yellow Cards	Red Cards
Leon Goretzka	6	CDM	0	NULL	0	0
Manuel Neuer	1	GK	0	NULL	0	0

Possible players from Germany not yet selected:

Player Name	Shirt Number	Position
Thomas Muller	13	Midfielder
Leroy Sane	33	Midfielder

vii)

```
[Enter the shirt number of the player you want to insert or [P] to go to the previous menu: 33
[Enter the specific position of the player (ST, CM, CB, etc): LM
SELECT player.emailaddress
FROM player, teammember
WHERE shirtnumber = 33 AND teammember.emailaddress = player.emailaddress AND teammember.country = 'Germany'
leroy.sane@gmail.com
Entering player 33 with position LM for match 5
```

The following players from Germany are already entered for match 5:

Player Name	Shirt Number	Detailed Position	From Minute	To Minute	Yellow Cards	Red Cards
Leon Goretzka	6	CDM	0	NULL	0	0
Leroy Sane	33	LM	0	NULL	0	0
Manuel Neuer	1	GK	0	NULL	0	0

Possible players from Germany not yet selected:

Player Name	Shirt Number	Position
Thomas Muller	13	Midfielder

viii)

```
NOTE: To go to previous menu, press [P]
Please enter the match ID for which you wish to add players: 5

NOTE: To go to previous menu, press [P]
Please enter the country for which you wish to add players: Germany

The following players from Germany are already entered for match 5:

| Player Name | Shirt Number | Detailed Position | From Minute | To Minute | Yellow Cards | Red Cards |
| Leon Goretzka | 6 | CDM | 0 | NULL | 0 | 0 |
| Leroy Sane | 33 | LM | 0 | NULL | 0 | 0 |
| Manuel Neuer | 1 | GK | 0 | NULL | 0 | 0 |

Possible players from Germany not yet selected:

| Player Name | Shirt Number | Position |
| Thomas Muller | 13 | Midfielder |

ERROR!!!: The team already has the maximum players (3) allowed for this match.
```

ix)

```
| Thomas Muller | 13 | Midfielder |

ERROR!!!: The team already has the maximum players (3) allowed for this match.

Soccer Main Menu
1. List information of matches of a country
2. Insert initial player information for a match
3. Purchase a match ticket!
4. Exit application

[Please Enter Your Option: 4
Exiting Application...
Connection to server closed successfully!
cs421g46@winter2023-comp421:~/P3-G46$
```

x)

```
cs421g46@winter2023-comp421:~/P2-G46$ cat q.sql
connect to cs421;

SELECT player.name
FROM player, playerperformance, teammember
WHERE player.emailaddress = playerperformance.emailaddress and player.emailaddress = teammember.emailaddress AND playerperformance.startingstatus = 'starting XI' AND teammember.country = 'Germany' AND playerperformance.matchid = 5;
cs421g46@winter2023-comp421:~/P2-G46$ db2 -t -f q.sql

Database Connection Information

Database server          = DB2/LINUX8664 11.5.8.0
SQL authorization ID     = CS421G46
Local database alias     = CS421

NAME
-----
Leon Goretzka
Leroy Sane
Manual Neuer

3 record(s) selected.
```

### Part(c):

The purpose of this menu item is to allow the user to view all the upcoming matches and then buy a ticket(s) for the desired match. The program will ask follow-up questions to place the order for the user.

The app flow is as described below.

For this we first update the orders and tickets table, then we update the match ticket and ticketOrders table. This is done to make sure that the order is linked to the ticket and ticket is linked to the match.

**\*\*the picture below illustrates the Orders table before executing the following commands\*\***

```
cs421g46@winter2023-comp421:~/P2-G46$ cat q.sql
connect to cs421;

SELECT *
FROM Orders;
cs421g46@winter2023-comp421:~/P2-G46$ db2 -t -f q.sql

Database Connection Information

Database server          = DB2/LINUX8664 11.5.8.0
SQL authorization ID     = CS421G46
Local database alias     = CS421

ORDERID    ORDERDATE    NUMEROFTICKETS
-----
1 05/21/2022          2
2 04/12/2022          2
3 12/30/2021          1
4 09/12/2022          1
5 08/12/2022          1
6 01/22/2021          1
7 05/05/2022          1
8 02/19/2022          1
9 09/25/2021          2
10 08/30/2020          1
11 03/15/2023         20
12 03/15/2023          4
13 03/15/2023         30
14 03/15/2023         10
15 03/15/2023          7

15 record(s) selected.
```



- 1) Once the user selects Option 3, they will be able to see all the upcoming matches in this world-cup.

```
Soccer Main Menu
  1. List information of matches of a country
  2. Insert initial player information for a match
  3. Purchase a match ticket!
  4. Exit application

[Please Enter Your Option: 3

Upcoming matches for this World Cup:

| Match ID          | Home Team          | Away Team          | Date              |
| 5                  | Germany            | Argentina          | 2023-03-16 13:00:00.0 |
| 6                  | Belgium            | England            | 2023-03-17 16:00:00.0 |
| 10                 | Germany            | Portugal           | 2023-03-19 10:00:00.0 |
```

- 2) Then the user will be asked to enter the matched of the match they would like to purchase a ticket for.

```
| 6                  | Belgium            | England            | 2023-03-17 16:00:00.0 |
| 10                 | Germany            | Portugal           | 2023-03-19 10:00:00.0 |

NOTE: To go to previous menu, press [P]
[Please enter the match ID of the match you wish to buy tickets for: 6

NOTE: To go to previous menu, press [P]
[Please enter the number of tickets you would like to purchase: 2
Purchasing 2 tickets for match 6
```

- 3) The program will execute a success message along with the number of tickets and order details.

```
NOTE: To go to previous menu, press [P]
[Please enter the number of tickets you would like to purchase: 2
Purchasing 2 tickets for match 6

#####
SUCCESS! Your order of 2 tickets for match 6 has been confirmed on 2023-03-15. Order ID: 16
#####

Soccer Main Menu
  1. List information of matches of a country
  2. Insert initial player information for a match
  3. Purchase a match ticket!
  4. Exit application
```

4) We can see that order 16 has been added to the table.

```
[cs421g46@winter2023-comp421:~/P2-G46$ cat q.sql
connect to cs421;

SELECT *
FROM Orders;
[cs421g46@winter2023-comp421:~/P2-G46$ db2 -t -f q.sql
```

Database Connection Information

```
Database server      = DB2/LINUX8664 11.5.8.0
SQL authorization ID = CS421G46
Local database alias = CS421
```

ORDERID	ORDERDATE	NUMEROFTICKETS
1	05/21/2022	2
2	04/12/2022	2
3	12/30/2021	1
4	09/12/2022	1
5	08/12/2022	1
6	01/22/2021	1
7	05/05/2022	1
8	02/19/2022	1
9	09/25/2021	2
10	08/30/2020	1
11	03/15/2023	20
12	03/15/2023	4
13	03/15/2023	30
14	03/15/2023	10
15	03/15/2023	7
16	03/15/2023	2

16 record(s) selected.

## Indexing:

```
CREATE INDEX index_match_time ON Match(time);
```

The SQL above will create an index of the time column of our match table. We believe that the time column (which is an SQL TIMESTAMP) can be used in many queries such as searching for a match within a particular time or finding the most recent match that took place, etc.

```
[cs421g46@winter2023-comp421:~/P2-G46$ cat q.sql
connect to cs421;

CREATE INDEX index_match_time ON Match(time);
[cs421g46@winter2023-comp421:~/P2-G46$ db2 -t -f q.sql

      Database Connection Information

Database server      = DB2/LINUX8664 11.5.8.0
SQL authorization ID = CS421G46
Local database alias = CS421

DB20000I  The SQL command completed successfully.
```

## Data Analytics:

```
cs421g46@winter2023-comp421:~/P2-G46$ cat q.sql
connect to cs421;

SELECT count(teammember.country) AS goal_nums, teammember.country
FROM playerperformance, match, teammember
Where playerperformance.matchid = match.matchid AND match.stage = 'Group Stage' AND playerperformance.emailaddress = teammember.emailaddress
GROUP By country;
cs421g46@winter2023-comp421:~/P2-G46$ db2 -t -f q.sql

Database Connection Information

Database server      = DB2/LINUX8664 11.5.8.0
SQL authorization ID = CS421G46
Local database alias = CS421

GOAL_NUMS  COUNTRY
-----
          1 Argentina
          1 Belgium
          1 Canada
          1 Croatia
          1 England
          2 Portugal

6 record(s) selected.
```

From the data exported from the output above we generated the plot as shown in our P3-Data-Analytics.xlsx

