

A Database Design Project: 2018 FIFA WORLD CUP

May 2, 2017

Cory Lang
CMPT 308 - Section 111



FIFA WORLD CUP
RUSSIA 2018

Table of Contents

Executive Summary:	3
Entity Relationship Diagram:	4
Tables:	5
Views:	18
Reports:	21
Stored Procedures:	23
Security:	24
Notes, Problems, Enhancements:	25



FIFA WORLD CUP
RUSSIA 2018

Executive Summary

The Federal International Football Association organizes the World Cup every four years. The 2014 World Cup was held in Brazil and the 2018 World Cup will be held in Russia. The tournament is composed of the 32 best national teams in the world and they compete through a group phase and a knockout phase.

This database is designed to be used by FIFA in order to track the players, referees, coaches, venues, and fans that attend various events at the 2018 World Cup. The implementation of this database will provide FIFA with a useful tool to monitor the activity at the World Cup.

Events that need to be tracked include which teams are playing where, who is refereeing the games, and which fans are attending which games.



Entity Relationship Diagram

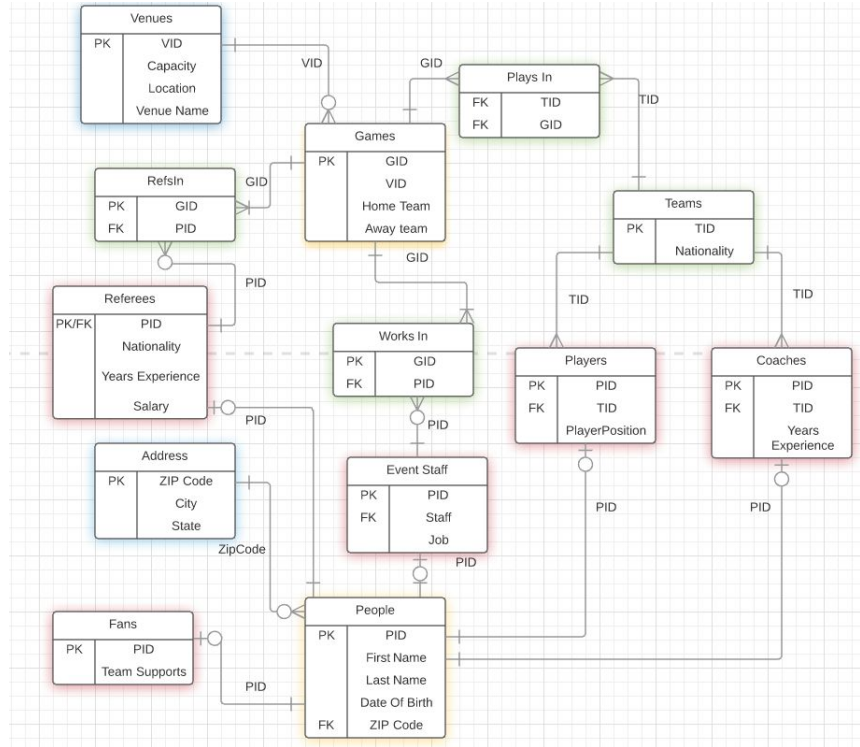


Table: People

List of all the People who are at the event.

```
Create Table People (  
  PID          char(4) not null,  
  FirstName    text,  
  LastName     text,  
  DateOfBirth  date,  
  ZipCode      text,  
  Primary key(PID),  
  Foreign key(ZipCode) references Address(ZipCode)  
);
```

pid character	firstname text	lastname text	dateofbirth date	zipcode text
P001	David	DeGea	2004-08-...	11566
P002	Cesar	Azpilicueta	2003-11-...	15044
P003	Gerard	Pique	1987-10-...	54494
P004	Sergio	Ramos	2006-07-...	50701
P005	Jordi	Alba	1996-12-...	12020
P006	Andreas	Iniesta	2009-04-...	30126
P007	Ander	Herrera	1998-08-...	11566
P008	David	Silva	1988-05-...	15044
P009	Diego	Costa	2007-08-...	54494
P010	Iago	Aspas	1986-01-...	50701
P011	Alvaro	Morata	1991-06-...	12020
P012	Hulen	Lopetegui	1987-05-...	30126
P013	Marc	Wilmots	1987-07-...	11566

Functional Dependencies: PID → First Name, Last Name, Date of Birth, Zip Code



Table: Players

List of all the Players who are Playing in the event.

```
Create Table Players (  
    PID          char(4) not null references people(pid),  
    TID          char(4),  
    PlayerPosition text,  
    Primary key(PID),  
    foreign key(TID) references Teams(Tid)  
);
```

pid character	tid character	playerpo... text
P001	T001	Goalie
P002	T001	Defender
P003	T001	Defender
P004	T001	Defender
P005	T001	Defender
P006	T001	Midfield
P007	T001	Midfield
P008	T001	Midfield
P009	T001	Forward
P010	T001	Forward
P011	T001	Forward

Functional Dependencies: $PID \rightarrow TID$, Player Position



Table: Coaches

List of all the Coaches who are coaching in the event.

```
Create Table Coaches (  
  PID          char(4) not null references people(pid),  
  TID          char(4),  
  YearsExperience int,  
  Primary key(PID),  
  Foreign Key(TID) references Teams(TID)  
);
```

pid character	tid character	yearsexp... integer
P012	T001	13
P013	T002	5
P014	T003	25
P015	T004	9
P016	T005	18

Functional Dependencies: PID \rightarrow TID, years experience



Table: Event Staff

List of all the Event Staff who are working at the event.

```
Create Table EventStaff(  
  PID char(4),  
  HourlyWageUSD integer,  
  Job text,  
  Primary key(PID),  
  foreign key(PID) references people(pid)  
);
```

pid character	hourlywa... integer	job text
P017	8	Guard
P018	10	Guard
P019	20	Guard
P020	18	Guard
P021	11	Guard
P022	12	Guard
P023	15	Guard
P024	19	Guard
P025	20	Guard
P026	9	Guard

Functional Dependencies: PID → Hourly Wage, Job



Table: Fans

List of all the Fans who are attending the event.

```
Create Table Fans (  
    PID                char(4),  
    TeamSupports       text,  
    Primary key(PID),  
    foreign key(PID) references people(pid)  
);
```

Functional Dependencies: PID \rightarrow Team Supported

pid character	teamsup... text
P032	France
P033	Egypt
P034	France
P035	Holland
P036	Belgium
P037	Belgium
P038	France
P039	Spain
P040	Spain
P041	Egypt
P042	Spin
P043	France



Tables: Referees

List of all the Referees who are reffing the event.

```
Create Table Referees (  
  PID char(4),  
  Nationality text,  
  YearsExperience integer,  
  YearlySalaryUSD integer,  
  Primary key(PID),  
  foreign key(PID) references people(pid)  
);
```

pid character	nationality text	yearsexp... integer	yearlysal... integer
P027	Spain	16	85000
P028	France	18	100000
P029	Belgium	9	55000
P030	Holland	25	83000
P031	Egypt	30	90000

Functional Dependencies: PID → Nationality, Years experience, Yearly Salary



Table: Address

List of all the Addresses of people.

```
Create Table Address (  
    ZipCode      text,  
    City         text,  
    State        text,  
    Primary key(ZipCode)  
);
```

zipcode text	city text	state text
11566	Marchalls	Oklahoma
15044	Beckville	Georgia
54494	Borley He...	Illinois
50701	Craig	Rhode Isl...
12020	Marshalls	Oklahoma
30126	Boulder J...	Connectic...

Functional Dependencies: Zip Code → City, State



Tables: Teams

List of all the Teams who are Playing in the event.

```
Create Table Teams (  
    TID          char(4),  
    Nationality  text,  
    Primary key(TID)  
);
```

tid character	nationality text
T001	Spain
T002	France
T003	Egypt
T004	Belgium
T005	Holland

Functional Dependencies: TID → Nationality



Tables: Venues

List of all the Venues being used in the event.

```
Create Table Venues (  
    VID text,  
    VenueName text,  
    Capacity int,  
    Location text,  
    Primary key(VID)  
);
```

vid text	venuena... text	capacity integer	location text
V001	Luzhniki ...	81000	Moscow
V002	Otkrytie ...	45360	Moscow
V003	Fisht Oly...	47659	Sochi
V004	Kazan Ar...	45105	Kazan
V005	Krasnoda...	36260	Krasnodar

Functional Dependencies: VID → Venue name, Capacity, Location



Table: Games

List of all the Games being played in the event.

```
Create Table Games(  
  GID          char(4),  
  VID          char(4) references Venues(VID),  
  HomeTeam     text,  
  AwayTeam     text,  
  Primary key(GID)  
);
```

gid character	vid character	hometeam text	awayteam text
G001	V001	Spain	Egypt
G002	V002	France	Holland
G003	V003	Egypt	Belgium
G004	V004	France	Spain
G005	V005	Belgium	Egypt
G006	V001	Spain	France
G007	V002	Holland	Egypt
G008	V003	France	Spain
G009	V004	Egypt	Spain
G010	V005	Holland	France

Functional Dependencies: $GID \rightarrow VID$, Date



Table: Works In

List of all the people who are working in games.

```
Create Table WorksIn (  
    GID          char(4) references Games(GID),  
    PID          char(4) references EventStaff(PID),  
    Primary key(GID,PID)  
);
```

gid character	pid character
G001	P017
G002	P018
G003	P019
G004	P020
G005	P021
G006	P022
G007	P023
G008	P024
G009	P025
G010	P026

Functional Dependencies: GID, RID, SID →



Table: RefsIn

List of all the people who are reffing the games.

```
Create Table RefsIn (  
    GID          char(4) references Games(GID),  
    PID          char(4) references Referees(PID),  
    Primary key(GID,PID)  
);
```

gid character	pid character
G001	P027
G002	P028
G003	P029
G004	P030
G005	P031
G006	P027
G007	P028
G008	P029
G009	P030
G010	P031

Functional Dependencies:



Table: Plays In

List of all the teams playing in the event.

```
Create Table PlaysIn (  
    GID          char(4) references Games(GID),  
    TID          char(4) references Teams(TID),  
    Primary key(GID,TID)  
);
```

Functional Dependencies: GID, TID→

gid character	tid character
G001	T001
G001	T003
G002	T002
G002	T005
G003	T003
G003	T004
G004	T002
G004	T001
G005	T004
G005	T003
G006	T001
G006	T002
G007	T005
G007	T003



View 1:

View a list of players and their teams that they play for

```
create view PlayersTeams AS
  select FirstName, LastName, Nationality as Team
  from people
  inner join players on people.pid = players.pid
  inner join teams on players.tid = teams.tid
  order by LastName
;
select * from PlayersTeams;
```

firstname text	lastname text	team text
Jordi	Alba	Spain
Iago	Aspas	Spain
Cesar	Azpilicueta	Spain
Diego	Costa	Spain
David	DeGea	Spain
Ander	Herrera	Spain
Andreas	Iniesta	Spain
Alvaro	Morata	Spain
Gerard	Pique	Spain
Sergio	Ramos	Spain
David	Silva	Spain



View 2:

View a list of coaches and the teams that they Coach

```
create view PlayersTeams AS
  select FirstName, LastName, Nationality as Team
  from people
  inner join players on people.pid = players.pid
  inner join teams on players.tid = teams.tid
  order by LastName
;
select * from PlayersTeams;
```

firstname text	lastname text	coachfor text
Danny	Blind	Holland
Hector	Cuper	Belgium
Didier	Deschamps	Egypt
Hulen	Lopetegui	Spain
Marc	Wilmots	France



View 3:

View a list of the teams and where they are playing their games

```
create view TeamsPlay AS
  select Nationality as Team, VenueName, games.GID as GameNumber
  from teams
  inner join PlaysIn on teams.tid = playsin.tid
  inner join Games on games.gid = playsin.gid
  inner join Venues on venues.vid = games.vid
  order by Nationality
;
select * from TeamsPlay;
```

team text	venuena... text	gamenu... character
Belgium	Fisht Oly...	G003
Belgium	Krasnoda...	G005
Egypt	Luzhniki ...	G001
Egypt	Kazan Ar...	G009
Egypt	Fisht Oly...	G003
Egypt	Otkrytie ...	G007
Egypt	Krasnoda...	G005
France	Fisht Oly...	G008
France	Krasnoda...	G010
France	Kazan Ar...	G004
France	Otkrytie ...	G002
France	Luzhniki ...	G006
Holland	Otkrytie ...	G007



Reports

1. Workers who are making more than \$11 per hour

```
select FirstName, LastName
from people inner join eventstaff on people.pid = eventstaff.pid
where hourlywageUSD > 11;
```

2. Coaches with more than 13 years of experience

```
select FirstName, LastName
from people inner join coaches on people.pid = coaches.pid
where yearsexperience > 13;
```

3. Teams who are playing games in Moscow

```
select distinct nationality
from teams inner join playsin on teams.tid = playsin.tid
inner join games on games.gid = playsin.gid
inner join venues on venues.vid = games.vid
where location = 'Moscow';
```



Reports: Generated

Report 1:

firstname text	lastname text
Robby	Moon
David	Hernandez
Kate	Boylan
Mark	Wahlberg
Tom	Brady
Mike	Anderson

Report 2:

firstname text	lastname text
Didier	Deschamps
Danny	Blind

Report 3:

nationality text
Egypt
France
Holland
Spain



Stored Procedure

Insert the People Id of a player and it will return which team they play for

```
create or replace function get_team_by_player(char(4), REFCURSOR) returns refcursor as
$$
declare
    playerId char(4)           := $1;
    resultset Refcursor        := $2;
begin
    open resultset for
        select p.pid, t.nationality
        from players p, teams t
        where p.tid = t.tid
        and p.pid = playerId;
    return resultset;
end;
$$
language plpgsql;

select get_team_by_player('P001', 'results');
fetch all from results;
```

pid character	nationality text
P001	Spain



Security

Here are two security functions to ensure that the right people have the correct access to certain aspects of the database.

```
create role databaseadmin;  
grant select, insert, update on all tables in schema public to DatabaseAdmin;
```

```
create role coordinator;  
grant select on all tables in schema public to coordinator;
```



Notes, Known Problems, and Future Enhancements

If I had the time to insert the full data for the entire world cup, there would have been many more queries that we would have been able to conduct. I limited the data to one team's worth of players. It would have been nice to include all 32 teams that are competing in the 2018 World Cup in Russia. It took a little longer in order to make sure that everything flowed together nicely and worked properly, but I was able to figure it out.

One problem with the database is the fact that as of now, only one worker is working each game. Also, coaches may be legally allowed to coach teams that is not their own nationality, and that was not implemented into the database.

If I had more time to implement the database, I would have liked to include a staff team table that would allow me to group workers into teams that can be assigned to each game. I would have also liked to include a check constraint that restricted a referee from refereeing a game in which his own team's nationality was playing. This will be implemented in the near future through future enhancements.

