RELATIONAL DATABASES PROJECT

Database for a Football Association

Made By:

Djevair Avmedoski CSE 1163

Elhan Musoski CSE 1193

Art Dilaveri CSE 1169

Mentor:

Dr.Dijana Capeska Bogatinoska

1. Introduction to the problem

A Football Association can be defined as a group of football fanatics who have the privilege of keeping track of everything going on in the footballing world.

It's responsible for everything connected to football, whether those are clubs, players, leagues, transfers, and most notably International football.

For each Football Club, the database keeps track of the *club's name, id, the city in which it's located and the year it was established*.

A club can have many players playing for it, and many players can play for many clubs throughout their careers. When they change clubs, we say that a player 'Transfers' from one club to another

A club can only ever play in one league, but one league is comprised of many football clubs

The database also keeps track of the Players and their attributes such *as id, first name, last name, age, in-game position, kit number, and which country* they represent on the international stage.

A player can only represent one country, but one country can be represented by multiple players.

The Country has its own attributes such as *name, rank, and personal id*.

Each country has its own League.

One country can have multiple minor and major leagues but said leagues can only be played in one certain country.

The league has its own *name, id, and number of teams participating in it*.

Each player has a specific Sponsor that sponsors them.

The database also keeps track of said sponsor and its components such as *name, id, and length of contract it offers*.

One sponsor can sponsor many players and many players can be sponsored by many sponsors.

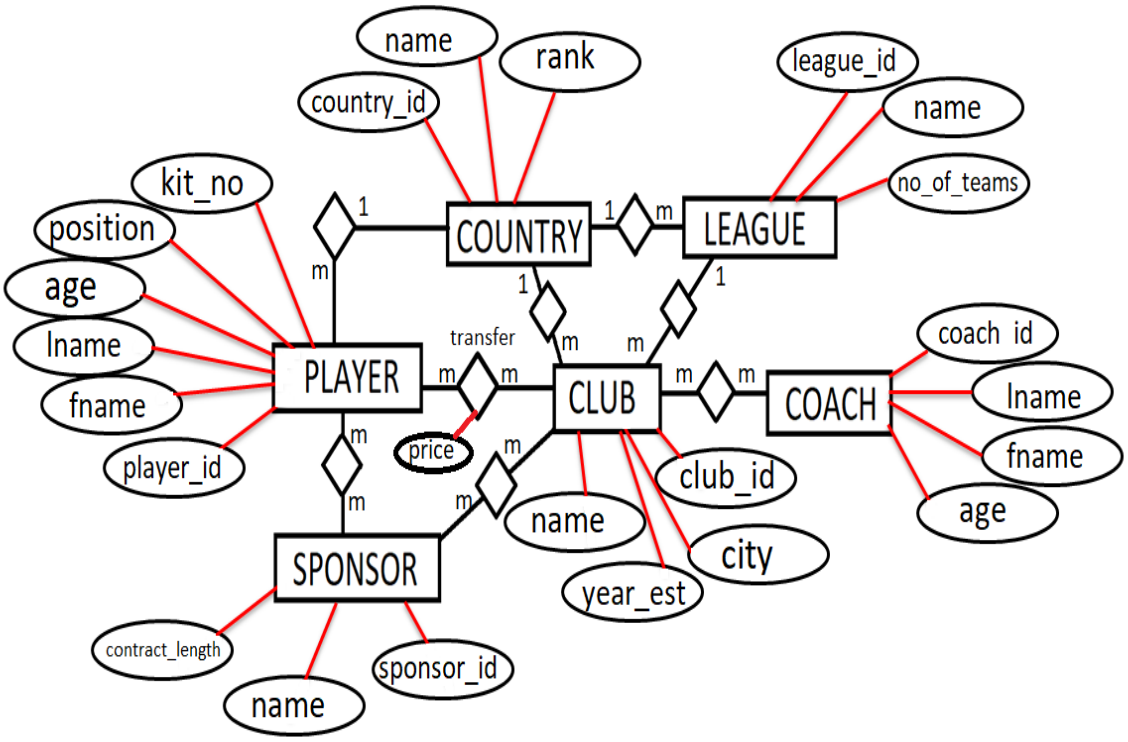
Also, the sponsor sponsors a certain club.

One sponsor can also sponsor multiple clubs and multiple clubs can have many sponsors.

The last piece of info the database keeps track of is Coaches/Managers.

The attributes of a coach/manager are: *first name, last name, personal id, and age*.

Many coaches can coach many football clubs throughout their careers and many clubs can be coached by many coaches.



2. The Relational Model

Club (club_id, name, city, year_est, country_id*, league_id*)

Player (player_id, fname, lname, age, position, kit_no, country_id*)

Sponsor (sponsor_id, name, contract_length)

Country (country_id, name, rank)

League (league_id, name, no_of_teams, country_id)

Coach (coach_id, lname, fname, age)

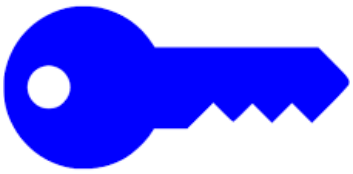
Transfer (player_id*, club_id*, price)

Club_Sponsor (club_id*, sponsor_id*)

Club_Coach (club_id*, coach_id*)

Player_Sponsor (player_id*, sponsor_id*)

PRIMARY KEY



FOREIGN KEY

3. SQL DDL code to create a database, and implementation using SQL Server

Let's firstly begin with labeling, creating and using our Football Association Database.

```
CREATE DATABASE Football_Association
USE Football_Association
```

Now, we can begin with creating out tables for the database.

First we have the table **COUNTRY**:

```
CREATE TABLE COUNTRY(
country_id numeric(10) primary key not null,
name varchar(25),
rank numeric(3));

INSERT INTO COUNTRY VALUES(74,'Germany',14);
INSERT INTO COUNTRY VALUES(33,'Italy',8);
INSERT INTO COUNTRY VALUES(12,'England',5);
INSERT INTO COUNTRY VALUES(21,'France',3);
INSERT INTO COUNTRY VALUES(67,'Portugal',9);
INSERT INTO COUNTRY VALUES(44,'Spain',10);

select * from COUNTRY order by rank
```

The result is:

	country_id	name	rank
1	21	France	3
2	12	England	5
3	33	Italy	8
4	67	Portugal	9
5	44	Spain	10
6	74	Germany	14

Then, we create the table **COACH**:

```
CREATE TABLE COACH(
coach_id numeric(10) primary key not null,
fname varchar(20),
lname varchar(20),
age numeric(2));

INSERT INTO COACH VALUES(50,'Luis','Enrique',52);
INSERT INTO COACH VALUES(60,'Didier','Deschamps',54);
INSERT INTO COACH VALUES(70,'Hansi','Flick',57);
INSERT INTO COACH VALUES(80,'Antonio','Conte',53);
INSERT INTO COACH VALUES(90,'Gareth','Southgate',52);
INSERT INTO COACH VALUES(100,'Jose','Mourinho',59);

select * from COACH
```

The result is:

	coach_id	fname	lname	age
1	50	Luis	Enrique	52
2	60	Didier	Deschamps	54
3	70	Hansi	Flick	57
4	80	Antonio	Conte	53
5	90	Gareth	Southgate	52
6	100	Jose	Mourinho	59

Next, we create the table SPONSOR:

```
CREATE table SPONSOR(
sponsor_id numeric(10) primary key not null,
name varchar(20),
contract_length int);

INSERT INTO SPONSOR VALUES(1,'Adidas',3);
INSERT INTO SPONSOR VALUES(2,'Nike',3);
INSERT INTO SPONSOR VALUES(3,'Puma',4);
INSERT INTO SPONSOR VALUES(4,'Kappa',2);
INSERT INTO SPONSOR VALUES(5,'Hummel',3);
INSERT INTO SPONSOR VALUES(6,'Slazenger',1);

select * from SPONSOR
```

The result is:

	sponsor_id	name	contract_length
1	1	Adidas	3
2	2	Nike	3
3	3	Puma	4
4	4	Kappa	2
5	5	Hummel	3
6	6	Slazenger	1

Next, we create the table PLAYER:

```
CREATE table PLAYER(
player_id numeric(10) primary key not null,
country_id numeric(10) not null constraint c_id_fk references COUNTRY(country_id),
fname varchar(20),
lname varchar(20),
age int,
kit_no int);

INSERT INTO PLAYER VALUES(101,12,'Marcus','Rashford',25,10);
INSERT INTO PLAYER VALUES(102,12,'Bukayo','Saka',21,7);
INSERT INTO PLAYER VALUES(401,33,'Nicolo','Barella',25,23);
INSERT INTO PLAYER VALUES(402,33,'Federico','Chiesa',25,7);
INSERT INTO PLAYER VALUES(201,74,'Leon','Goretzka',27,8);
INSERT INTO PLAYER VALUES(202,12,'Jonas','Hector',32,14);
INSERT INTO PLAYER VALUES(501,21,'Houssem','Aouar',24,8);
INSERT INTO PLAYER VALUES(502,21,'Kylian','Mbappe',24,7);
INSERT INTO PLAYER VALUES(301,44,'Jordi','Alba',33,18);
INSERT INTO PLAYER VALUES(302,44,'Lucas','Vasquez',32,17);
INSERT INTO PLAYER VALUES(601,67,'Goncalo','Ramos',21,88);
INSERT INTO PLAYER VALUES(602,67,'Diogo','Costa',23,99);

select * from PLAYER
```

The result is:

	player_id	country_id	fname	lname	age	kit_no
1	101	12	Marcus	Rashford	25	10
2	102	12	Bukayo	Saka	21	7
3	201	74	Leon	Goretzka	27	8
4	202	12	Jonas	Hector	32	14
5	301	44	Jordi	Alba	33	18
6	302	44	Lucas	Vasquez	32	17
7	401	33	Nicolo	Barella	25	23
8	402	33	Federico	Chiesa	25	7
9	501	21	Houssem	Aouar	24	8
10	502	21	Kylian	Mbappe	24	7
11	601	67	Goncalo	Ramos	21	88
12	602	67	Diogo	Costa	23	99

Then we have the table LEAGUE:

```
create table LEAGUE(
league_id numeric(10) primary key not null,
country_id numeric(10) not null constraint cl_id_fk references COUNTRY(country_id),
name varchar(25),
no_of_teams int);

INSERT INTO LEAGUE VALUES(1,12,'Premier League',20);
INSERT INTO LEAGUE VALUES(2,74,'Bundesliga',18);
INSERT INTO LEAGUE VALUES(3,44,'LaLiga',20);
INSERT INTO LEAGUE VALUES(4,33,'Seria A',20);
INSERT INTO LEAGUE VALUES(5,21,'Ligue 1',20);
INSERT INTO LEAGUE VALUES(6,67,'Liga NOS',18);

select * from LEAGUE
```

The result is:

	league_id	country_id	name	no_of_teams
1	1	12	Premier League	20
2	2	74	Bundesliga	18
3	3	44	LaLiga	20
4	4	33	Seria A	20
5	5	21	Ligue 1	20
6	6	67	Liga NOS	18

Next we create the table CLUB:

```
create table CLUB(
club_id numeric(10) primary key not null,
country_id numeric(10) not null constraint cc_id_fk references COUNTRY(country_id),
league_id numeric(10) not null constraint cle_id_fk references LEAGUE(league_id),
name varchar(25),
city varchar(25),
yeat_est DATE);

INSERT INTO CLUB VALUES(5,12,1,'Manchester United','Manchester','06.05.1878');
INSERT INTO CLUB VALUES(10,12,1,'Arsenal','London','06.08.1886');
INSERT INTO CLUB VALUES(6,74,2,'Bayern Munich','Munich','02.27.1900');
INSERT INTO CLUB VALUES(45,74,2,'FC Köln','Cologne','02.13.1948');
INSERT INTO CLUB VALUES(11,33,4,'Juventus','Turin','10.01.1897');
INSERT INTO CLUB VALUES(14,33,4,'Internazionale','Milano','03.09.1908');
INSERT INTO CLUB VALUES(7,21,5,'PSG','Paris','08.12.1970');
INSERT INTO CLUB VALUES(35,21,5,'OL Lyon','Lyon','10.02.1950');
INSERT INTO CLUB VALUES(1,44,3,'Real Madrid','Madrid','06.03.1902');
INSERT INTO CLUB VALUES(3,44,3,'FC Barcelona','Barcelona','29.10.1899');
INSERT INTO CLUB VALUES(42,67,6,'FC Porto','Porto','28.09.1893');
INSERT INTO CLUB VALUES(41,67,6,'SL Benfica','Lisbon','28.02.1904');

select * from CLUB order by league_id
```

The result is:

	club_id	country_id	league_id	name	city	yeat_est
1	5	12	1	Manchester United	Manchester	1878-06-05
2	10	12	1	Arsenal	London	1886-06-08
3	6	74	2	Bayern Munich	Munich	1900-02-27
4	45	74	2	FC Köln	Cologne	1948-02-13
5	1	44	3	Real Madrid	Madrid	1902-06-03
6	3	44	3	FC Barcelona	Barcelona	1899-10-29
7	11	33	4	Juventus	Turin	1897-10-01
8	14	33	4	Internazionale	Milano	1908-03-09
9	35	21	5	OL Lyon	Lyon	1950-10-02
10	7	21	5	PSG	Paris	1970-08-12
11	41	67	6	SL Benfica	Lisbon	1904-02-28
12	42	67	6	FC Porto	Porto	1893-09-28

Next we have the CLUB_SPONSOR table:

```
create table CLUB_SPONSOR(
club_id numeric(10) not null constraint cs references CLUB(club_id),
sponsor_id numeric(10) not null constraint sc references SPONSOR(sponsor_id),
constraint clu_spo primary key (club_id,sponsor_id));

INSERT INTO CLUB_SPONSOR VALUES(5,1);
INSERT INTO CLUB_SPONSOR VALUES(10,1);
INSERT INTO CLUB_SPONSOR VALUES(11,1);
INSERT INTO CLUB_SPONSOR VALUES(14,2);
INSERT INTO CLUB_SPONSOR VALUES(6,1);
INSERT INTO CLUB_SPONSOR VALUES(45,4);
INSERT INTO CLUB_SPONSOR VALUES(7,2);
INSERT INTO CLUB_SPONSOR VALUES(35,3);
INSERT INTO CLUB_SPONSOR VALUES(3,2);
INSERT INTO CLUB_SPONSOR VALUES(1,1);
INSERT INTO CLUB_SPONSOR VALUES(42,5);
INSERT INTO CLUB_SPONSOR VALUES(41,6);

select * from CLUB_SPONSOR
```

The result is:

	club_id	sponsor_id
1	1	1
2	3	2
3	5	1
4	6	1
5	7	2
6	10	1
7	11	1
8	14	2
9	35	3
10	41	6
11	42	5
12	45	4

The next table is TRANSFER:

```
create table TRANSFERS(
player_id numeric(10) not null constraint p_id references PLAYER(player_id),
club_id numeric(10) not null constraint t_c_fk references CLUB(club_id),
price numeric(10)
constraint ptr_pc_pk primary key(player_id,club_id));
```

Then, we create the table CLUB_COACH:

```
create table CLUB_COACH(
club_id numeric(10) not null constraint c_c references CLUB(club_id),
coach_id numeric(10) not null constraint cc references COACH(coach_id),
constraint ccc primary key(club_id,coach_id));

INSERT INTO CLUB_COACH VALUES(5,90);
INSERT INTO CLUB_COACH VALUES(11,80);
INSERT INTO CLUB_COACH VALUES(6,70);
INSERT INTO CLUB_COACH VALUES(35,60);
INSERT INTO CLUB_COACH VALUES(3,50);
INSERT INTO CLUB_COACH VALUES(42,100);

select * from CLUB_COACH
```

The result is:

	club_id	coach_id
1	3	50
2	5	90
3	6	70
4	11	80
5	35	60
6	42	100

And the final table that we have to create is the table PLAYER_SPONSOR:

```
create table PLAYER_SPONSOR(
player_id numeric(10) not null constraint ps references PLAYER(player_id),
sponsor_id numeric(10) not null constraint sp references SPONSOR(sponsor_id),
constraint new_ps primary key(player_id,sponsor_id));

INSERT INTO PLAYER_SPONSOR VALUES(101,1);
INSERT INTO PLAYER_SPONSOR VALUES(202,2);
INSERT INTO PLAYER_SPONSOR VALUES(301,3);
INSERT INTO PLAYER_SPONSOR VALUES(401,4);
INSERT INTO PLAYER_SPONSOR VALUES(501,5);
INSERT INTO PLAYER_SPONSOR VALUES(602,6);

select * from PLAYER_SPONSOR
```

The result is:

	player_id	sponsor_id
1	101	1
2	202	2
3	301	3
4	401	4
5	501	5
6	602	6

4. SQL DML code to create some queries, and implementation using SQL Server

Now that we have created and inserted some values into our tables, let's give a few examples of SQL DML code to play around with some queries.

1. Make a report that will give us the first and last name, kit number of all French players. Order it by kit number.

```
select fname,lname,kit_no
from player
where country_id=21
order by kit_no
```

100 %

Results | Messages

	fname	lname	kit_no
1	Kylian	Mbappe	7
2	Houssem	Aouar	8

2. Make a report that will give us the name and club id of all clubs where the club is greater than 20.

```
select name,club_id
from club
where club_id>20
```

00 %

Results | Messages

	name	club_id
1	OL Lyon	35
2	SL Benfica	41
3	FC Porto	42
4	FC Köln	45

3. Insert into the player a new player for both Manchester United and Bayern Munich. Display the table.

```
INSERT INTO PLAYER VALUES (103,12,'Harry','Maguire',29,5);
INSERT INTO PLAYER VALUES (203,74,'Jamal','Musiala',19,14);

select * from PLAYER
```

100 %

Results | Messages

	player_id	country_id	fname	lname	age	kit_no
1	101	12	Marcus	Rashford	25	10
2	102	12	Bukayo	Saka	21	7
3	103	12	Harry	Maguire	29	5
4	201	74	Leon	Goretzka	27	8
5	202	12	Jonas	Hector	32	14
6	203	74	Jamal	Musiala	19	14
7	301	44	Jordi	Alba	33	18
8	302	44	Lucas	Vasquez	32	17
9	401	33	Nicolo	Barella	25	23
10	402	33	Federico	Chiesa	25	7
11	501	21	Houssem	Aouar	24	8
12	502	21	Kylian	Mbappe	24	7
13	601	67	Goncalo	Ramos	21	88
14	602	67	Diogo	Costa	23	99

4. Make a report that will give us all details about CLUB and LEAGUE, where the number of teams in the league are greater than 19. Order by league id.

```
select * from LEAGUE l,CLUB c where l.country_id=c.country_id and l.no_of_teams>19 order by l.league_id
```

100 %

Results | Messages

	league_id	country_id	name	no_of_teams	club_id	country_id	league_id	name	city	yeat_est
1	1	12	Premier League	20	5	12	1	Manchester United	Manchester	1878-06-05
2	1	12	Premier League	20	10	12	1	Arsenal	London	1886-06-08
3	3	44	LaLiga	20	1	44	3	Real Madrid	Madrid	1902-06-03
4	3	44	LaLiga	20	3	44	3	FC Barcelona	Barcelona	1899-10-29
5	4	33	Seria A	20	11	33	4	Juventus	Turin	1897-10-01
6	4	33	Seria A	20	14	33	4	Internazionale	Milano	1908-03-09
7	5	21	Ligue 1	20	7	21	5	PSG	Paris	1970-08-12
8	5	21	Ligue 1	20	35	21	5	OL Lyon	Lyon	1950-10-02

5. Find the clubs name and id where the country represents ‘Germany’, except the club ‘FC Köln’.

```
select cb.name,cb.city
from CLUB cb, COUNTRY c
where c.country_id=cb.country_id and c.country_id=74 and cb.name <> 'FC Köln'
```

100 %

Results | Messages

	name	city
1	Bayern Munich	Munich

6. Make an Inner Join Query between PLAYER and COUNTRY that displays the first name and last name of the players.

```
select fname,lname,kit_no
from PLAYER inner join COUNTRY
on  PLAYER.country_id=COUNTRY.country_id
```

100 %

Results | Messages

	fname	lname	kit_no
1	Marcus	Rashford	10
2	Bukayo	Saka	7
3	Harry	Maguire	5
4	Leon	Goretzka	8
5	Jonas	Hector	14
6	Jamal	Musiala	14
7	Jordi	Alba	18
8	Lucas	Vasquez	17
9	Nicolo	Barella	23
10	Federico	Chiesa	7
11	Houssem	Aouar	8
12	Kylian	Mbappe	7
13	Goncalo	Ramos	88
14	Diogo	Costa	99

7. Update the league_id to 7 for all teams with the club_id=7 and 35

```
update club set league_id=7 where club_id=7 and club_id=35
```

8. Count the number of clubs, excluding ‘FC Porto’

```
select count(*) as TOTAL from CLUB cb,COUNTRY c where cb.country_id=c.country_id and cb.name <> 'FC Porto'
```

100 %

Results | Messages

	TOTAL
1	11

5. Conclusion

As we can see from some of the above mentioned examples, we can see that in order to make a stable, aesthetically pleasing and most importantly a functioning database we have to start off with creating/solving the given problem at hand.

Next we make an ER (Entity Relationship) Diagram and a Relational Model.

Then the most interesting, but also time consuming process is creating and working with SQL Code.

Connecting the tables with primary and/or foreign key can be a bit of a hassle, but that can all be solved with a bit of practice, hard work and determination.

We use some very simple, but interesting queries and examples, which might not win us a Nobel Prize or a Competition, but can help us and any novice to get a better understanding in creating a database.

6. References

Here are some websites we use to get some info regarding out project:

FIFA Rankings - https://www.fifa.com/fifa-world-ranking/men?dateId=id13869

Club Power Rankings - https://brandirectory.com/rankings/football/table

Player Info - https://www.transfermarkt.com/

Some other general information - https://www.wikipedia.org/