FIFA World Cup 2022 Database

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Overview

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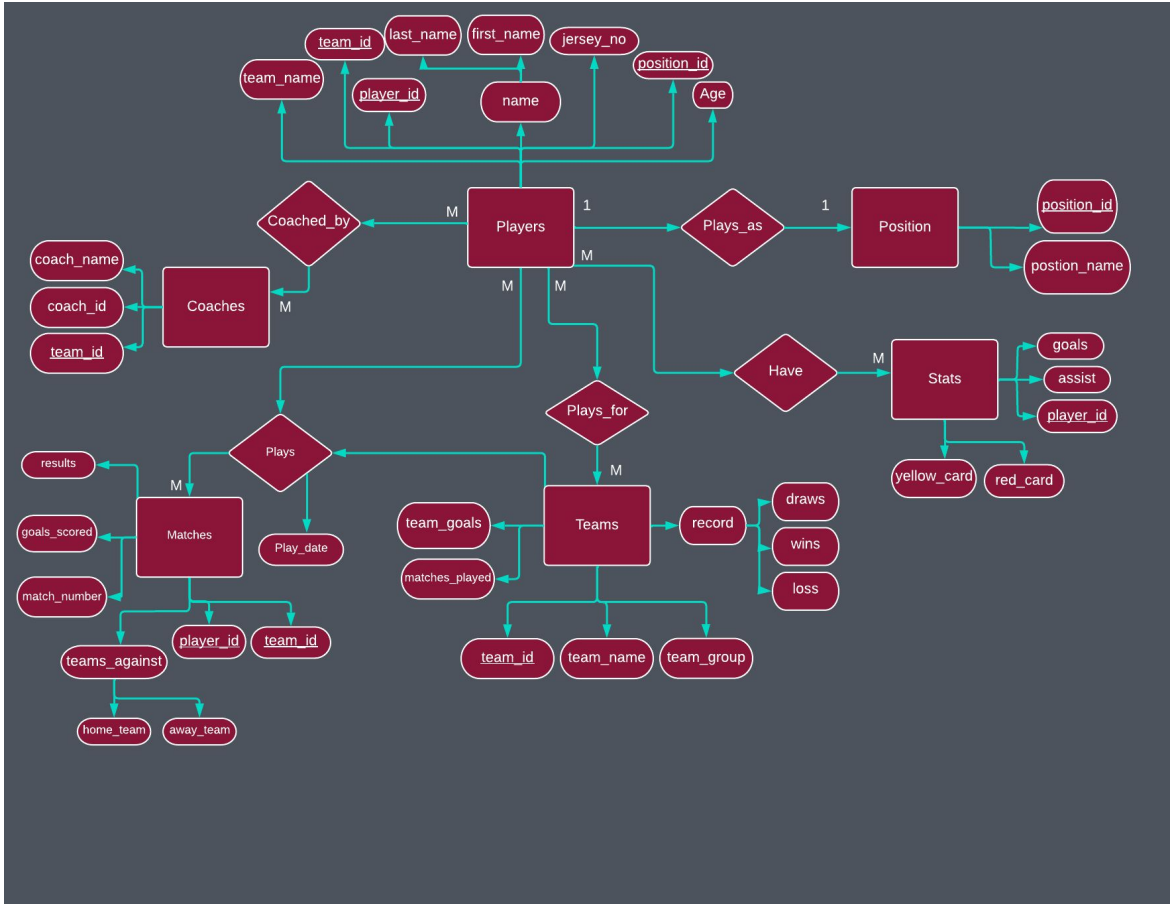
Application Description

- We decided to create a simple database of the World Cup 2022 in Qatar. Because the World Cup has begun we thought it was ideal to create a database that could help us keep track of the most important stats from players and teams. Also, we chose to do the World Cup because we thought it would be fun to apply different database concepts to futbol.

FIFA WORLD CUP
Qatar2022

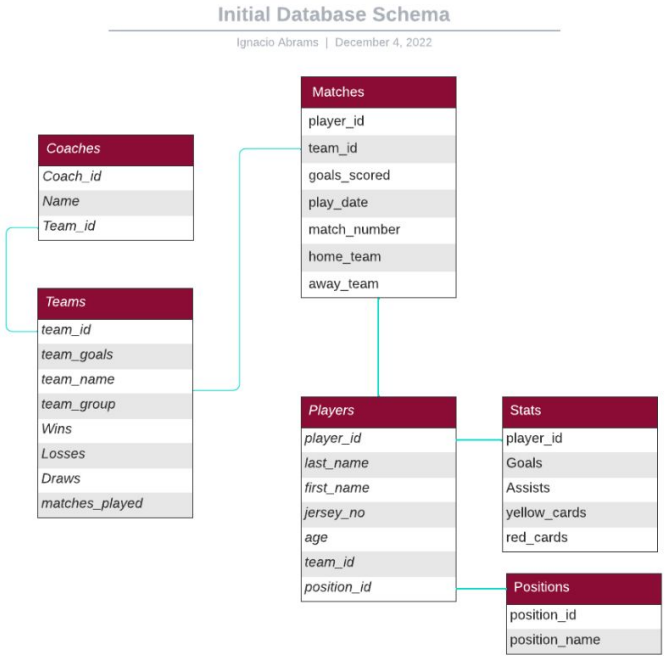
Conceptual Model

- Entities: Players, Matches, Position, Teams, Coaches, and Stats.
- Relationships: Plays_for, Have, Plays_as, Coached_by, and Plays.
- Weak entities: Stats is a weak entity because it solely depends on the player entity. The identifying relationship is have.
- Composite attributes: Name. The name attribute is composed by the player first name and last name. (first_name, last_name). Record. The record of a team is composed by their wins, draws, and losses. Teams_against. This attribute is composed by the teams who will go against each other.(home_team, away_team)
- Relationship attributes: play_date. Is determined by Matches and Teams entity.
- Derived attribute: Also the record attribute can be derived by the results attribute in the Matches entity.



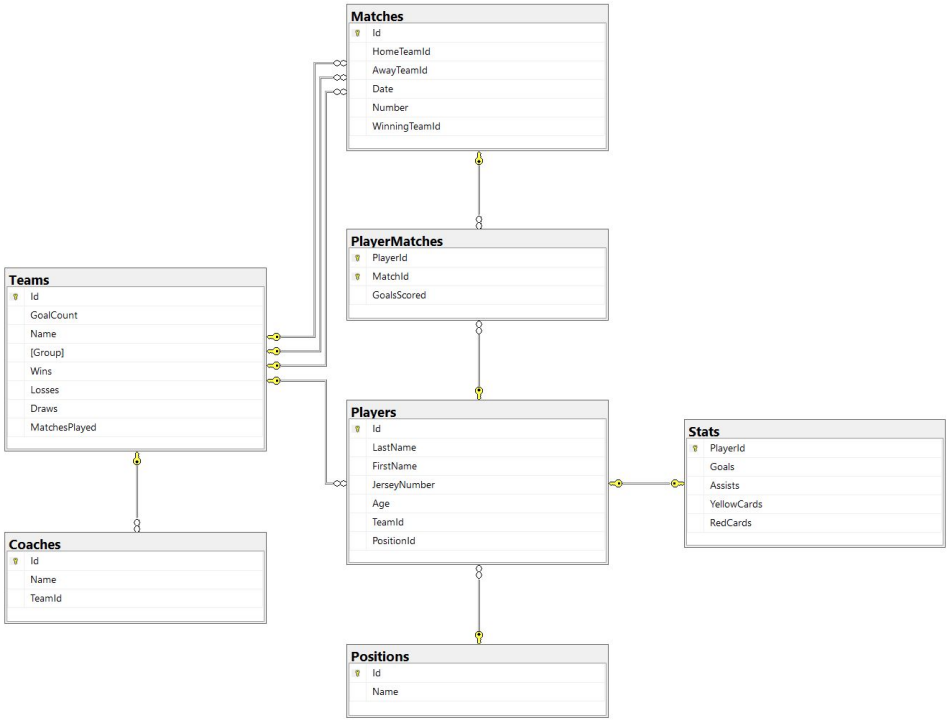
Initial database Schema

- Our initial database schema resembles our ER diagram.
- Our tables are: Coaches, Matches, Teams, Players, Stats and Positions.
- Because most of our relationships are many to many relationships, most of our data in our ER diagram can be represented in our schema.
- Very straightforward.



Final Database Schema

- After revising our initial database schema, we thought about adding the PlayerMatches table that consists of the PlayerID, MatchId and GoalsScored tuples.
- The reason for this was to not only have the data of a match, but also have the data of when players score in a match.
- The rest remained more or less the same although we refined the attribute semantics, all joins are lossless and the dependencies are in 3rd normal Form.
- Primary keys: Id
- Foreign keys: PlayerId, PositionId, TeamId, and MatchId.



Database Instance

```
SELECT TOP (1000) [Id]
      ,[GoalCount]
      ,[Name]
      ,[Group]
      ,[Wins]
      ,[Losses]
      ,[Draws]
      ,[MatchesPlayed]
  FROM [soccer_db].[dbo].[Teams]
```

Results | Messages

Id	GoalCount	Name	Group	Wins	Losses	Draws	MatchesPlayed
2	6	Portugal	H	2	1	0	3
3	3	Korea Republic	H	1	1	1	3
4	2	Uruguay	H	1	1	1	3
5	5	Ghana	H	1	2	0	3
6	3	Brazil	G	2	1	0	3
7	4	Switzerland	G	2	1	0	3
8	4	Cameroon	G	1	1	1	3
9	5	Serbia	G	0	2	1	3
10	4	Morocco	F	2	0	1	3
11	4	Croatia	F	1	0	2	3
12	1	Belgium	F	1	1	1	3
13	2	Canada	F	0	3	0	3
14	4	Japan	E	2	1	0	3
15	9	Spain	E	1	1	1	3
16	6	Germany	E	1	1	1	3
17	3	Costa Rica	E	1	2	0	3
18	6	France	D	2	1	0	3
19	3	Australia	D	2	1	0	3
20	1	Tunisia	D	1	1	1	3
21	1	Denmark	D	0	2	1	3
22	5	Argentina	C	2	1	0	3
23	2	Poland	C	1	1	1	3
24	2	Mexico	C	1	1	1	3
25	3	Saudi Arabia	C	1	2	0	3
26	9	England	B	2	0	1	3
27	2	USA	B	1	0	2	3
28	4	Iran	B	1	2	0	3
29	1	Wales	B	0	2	1	3
30	5	Netherlands	A	2	0	1	3
31	5	Senegal	A	2	1	0	3
32	4	Ecuador	A	1	1	1	3
33	1	Qatar	A	0	3	0	3

```
SELECT TOP (1000) [PlayerId]
      ,[Goals]
      ,[Assists]
      ,[YellowCards]
      ,[RedCards]
  FROM [soccer_db].[dbo].[Stats]
```

Results | Messages

PlayerId	Goals	Assists	YellowCards	RedCards
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	1	1	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	1	0
14	0	0	0	0
15	0	2	5	0
16	0	0	0	0
17	0	0	0	0
18	0	0	1	0
19	0	0	0	0
20	0	0	0	0
21	1	2	0	0
22	0	0	0	0
23	0	0	0	0
24	1	0	0	0
25	1	0	0	0
26	0	0	0	0

```
SELECT TOP (1000) [Id]
      ,[Name]
  FROM [soccer_db].[dbo].[Positions]
```

Results | Messages

Id	Name
1	Goalkeeper
2	Defender
3	Midfielder
4	Forward
5	Manager

```
SELECT TOP (1000) [Id]
      ,[LastName]
      ,[FirstName]
      ,[JerseyNumber]
      ,[Age]
      ,[TeamId]
      ,[PositionId]
  FROM [soccer_db].[dbo].[Players]
```

Results | Messages

Id	LastName	FirstName	JerseyNumber	Age	TeamId	PositionId
1	Turner	Matt	1	28	27	1
2	Horvath	Ethan	12	27	27	1
3	Johnson	Sean	25	33	27	1
4	Sergino	Dest	22	22	27	2
5	Zimmerman	Walker	3	29	27	2
6	Robinson	Antonee	5	25	27	2
7	Ream	Tim	13	35	27	2
8	Long	Aaron	15	30	27	2
9	Moore	Shaquell	18	26	27	2
10	Carter-Vickers	Cameron	20	24	27	2
11	Yedlin	DeAndre	22	29	27	2
12	Scally	Joe	26	19	27	2
13	Adams	Tyler	4	23	27	3
14	Musah	Yunus	6	20	27	3
15	McKennie	Weston	8	24	27	3
16	De La Torre	Luca	14	24	27	3
17	Roldan	Cristian	17	27	27	3
18	Perry-Acosta	Kellyn	23	27	27	3
19	Reyna	Giovanni	7	20	27	4
20	Ferreira	Jesus	10	21	27	4
21	Pulisic	Christian	10	24	27	4
22	Aaronson	Brenden	11	22	27	4
23	Morris	Jordan	16	28	27	4
24	Wright	Haji	19	24	27	4
25	Weah	Tim	21	22	27	4
26	Sargent	Josh	24	22	27	4

```
SELECT TOP (1000) [PlayerId]
      ,[MatchId]
      ,[GoalsScored]
  FROM [soccer_db].[dbo].[PlayerMatches]
```

Results | Messages

PlayerId	MatchId	GoalsScored
21	4	1
25	2	1

```
SELECT TOP (1000) [Id]
      ,[Name]
      ,[TeamId]
  FROM [soccer_db].[dbo].[Coaches]
```

Results | Messages

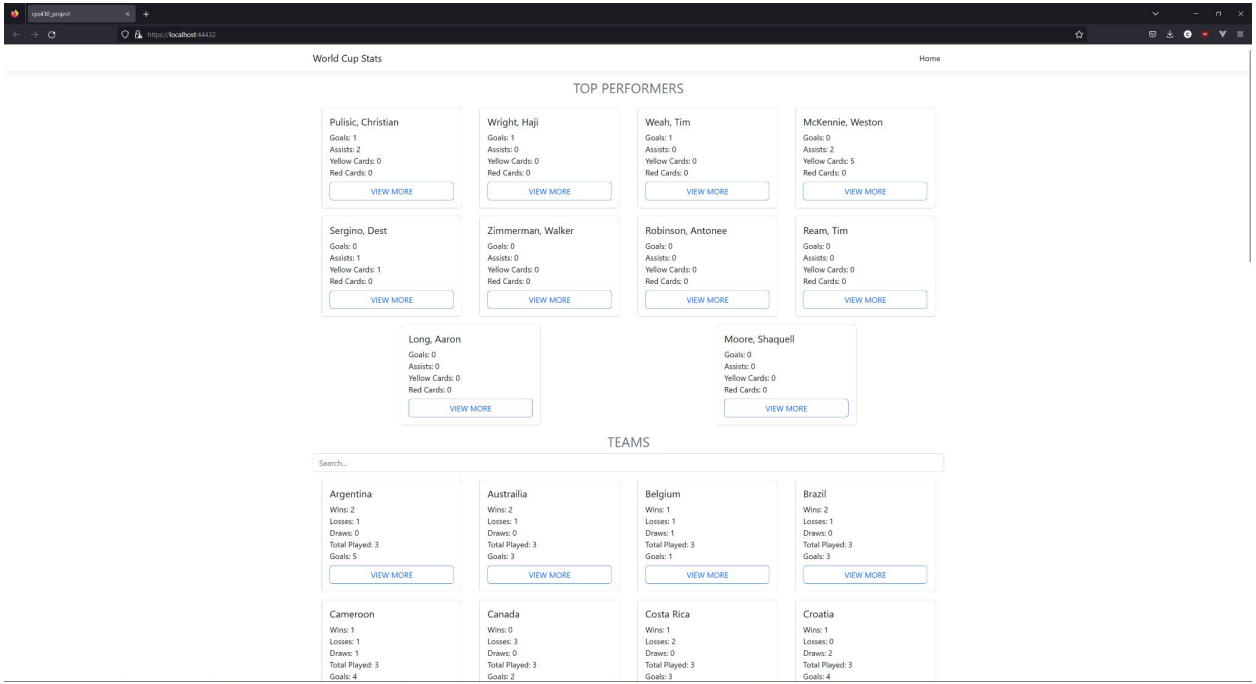
Id	Name	TeamId
1	Gregg Berhalter	27

```
SELECT TOP (1000) [Id]
      ,[HomeTeamId]
      ,[AwayTeamId]
      ,[Date]
      ,[Number]
      ,[WinningTeamId]
  FROM [soccer_db].[dbo].[Matches]
```

Results | Messages

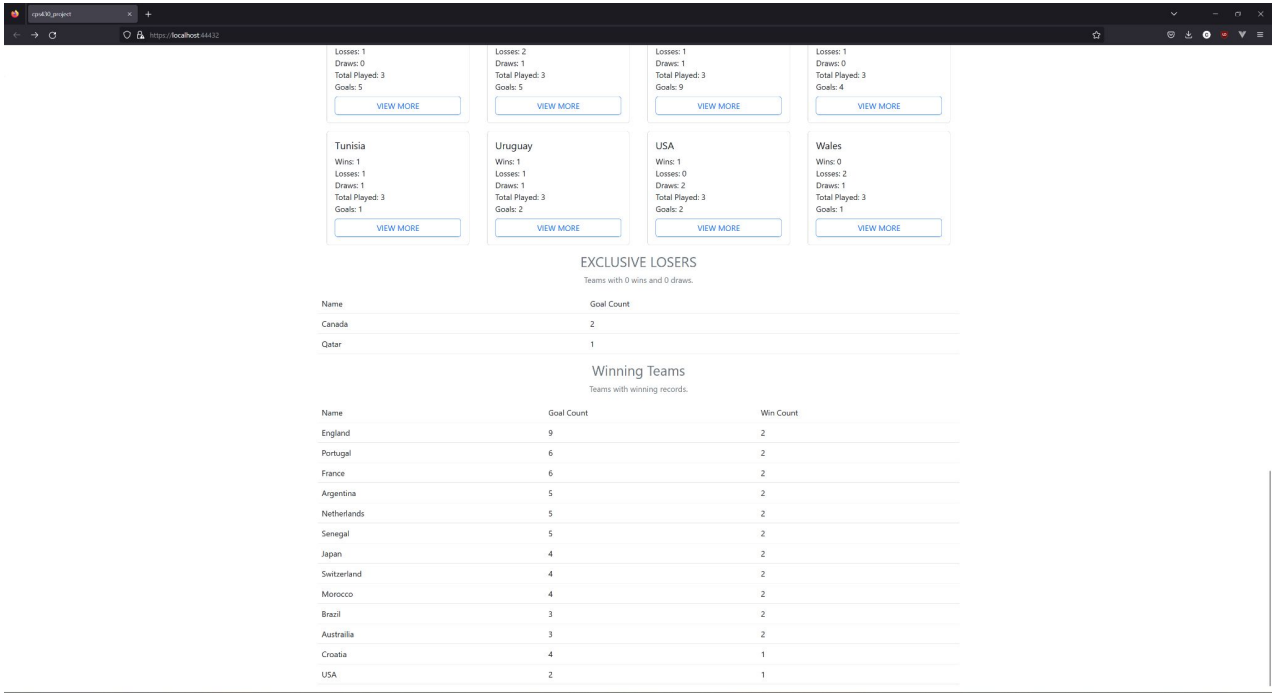
Id	HomeTeamId	AwayTeamId	Date	Number	WinningTeamId
2	27	29	2022-11-21 00:00:00.0000000	1	NULL
3	26	27	2022-11-25 00:00:00.0000000	2	NULL
4	28	27	2022-11-29 00:00:00.0000000	3	27
5	30	27	2022-12-03 00:00:00.0000000	4	30

Web Interface



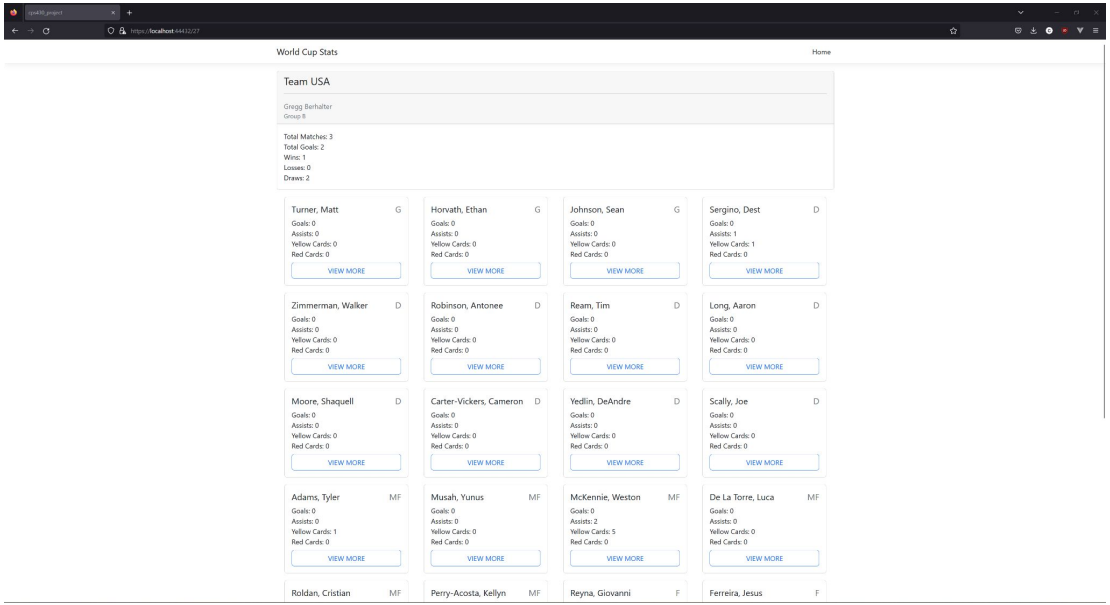
- Home view shows top performers, and a list of teams competing in the World Cup, with their stats

Web Interface



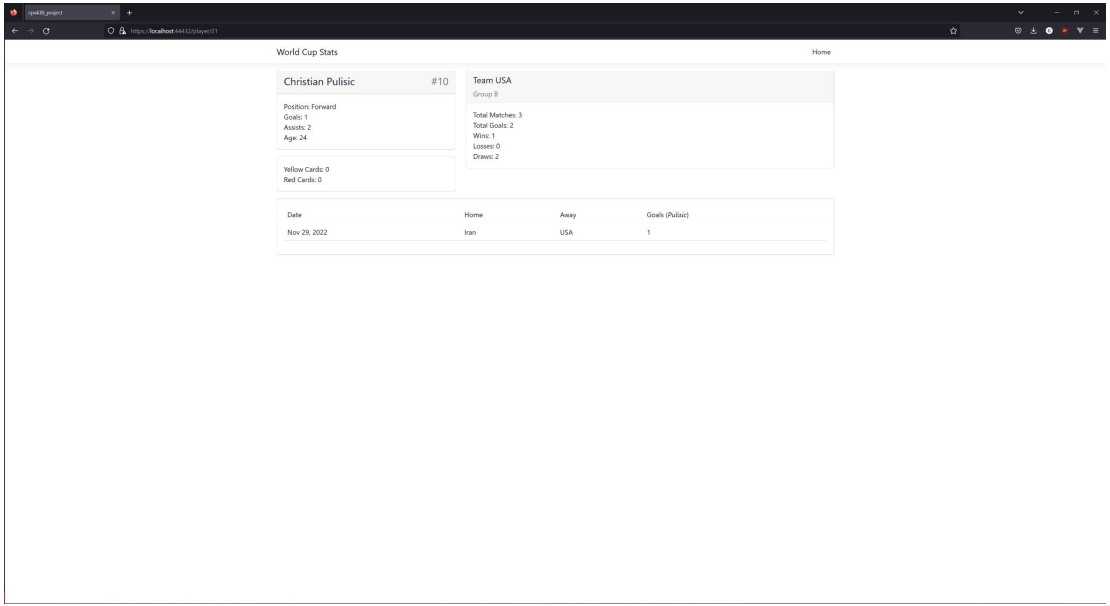
- Can view the teams with winning records, and those who have never won or tied a game

Web Interface



- The Team view shows a list of players and basic stats

Web Interface



- The player view shows basic stats about both the player and his team

Observations and Conclusions

- ORMs can be opinionated about naming schemes
  - Column names should be in “PascalCase”, no underscores
  - By convention, primary keys should be called “Id” or “<Object>Id” (PlayerId)
  - By convention, foreign keys should be called “<Object>Id” (PlayerId)
- ASP.NET modifies names to “camelCase” when transferring over the REST API
- To reduce the amount of data being sent, either use SELECT statements when querying the database, or map out smaller objects after they have been pulled from the database, but before sending them as a response.
- Relationships, whether a relationship was a many-to-many relationship or otherwise.