

Final Report

Group 18

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<http://web.engr.oregonstate.edu/~thomast2/cs340-2/Project/home.html>

1. Introduction

This project includes basic information about the NBA playoffs and seasons. Information such as player stats, rosters, and player information can be viewed. This site is meant for any fan of the NBA who is looking for information about NBA teams and players. This site is also for users who want to display who their favorite players and teams are.

2. Detailed Functionality & Requirements

This section describes the business rules and the requirements of the application in detail.

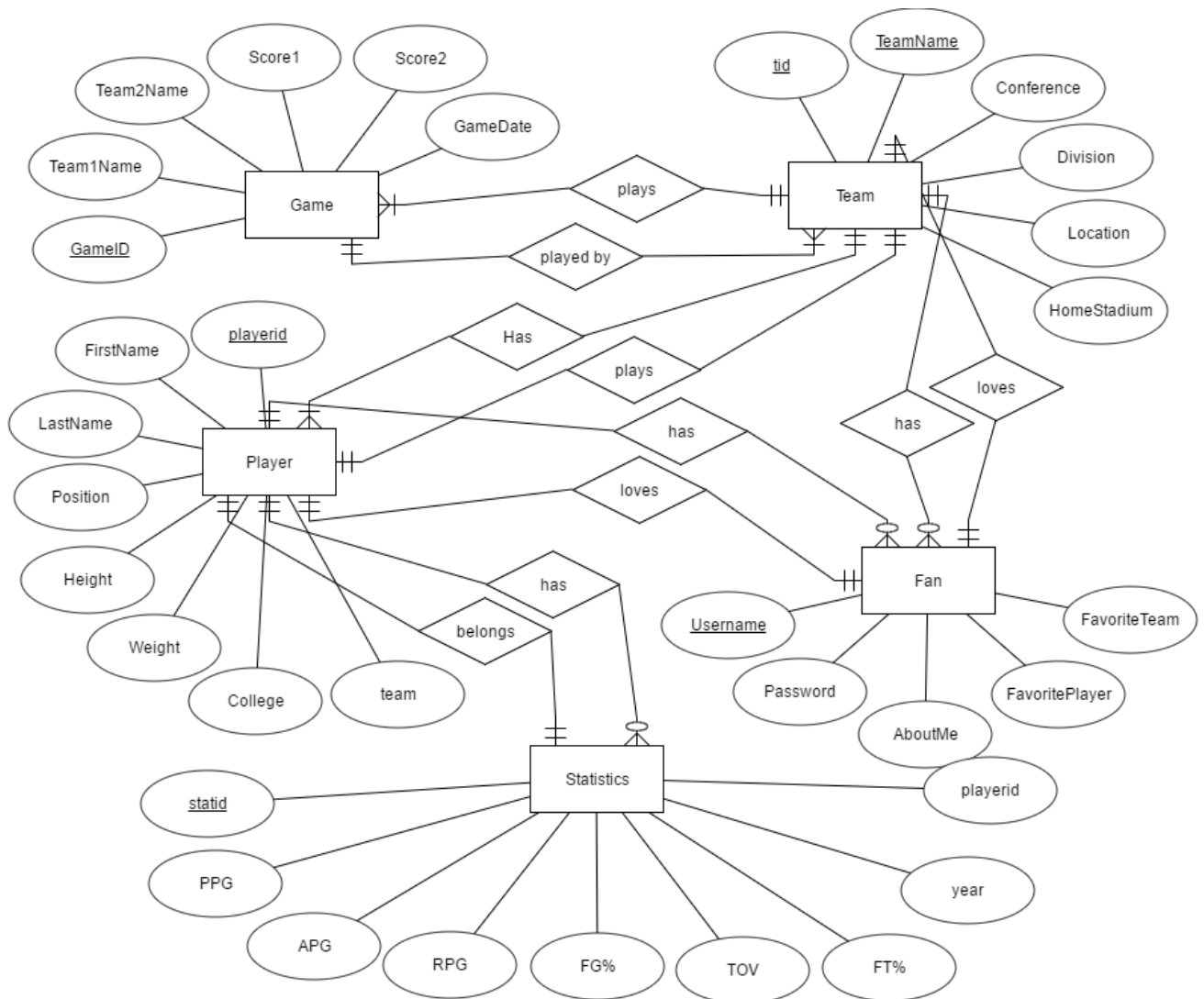
- Requirements for the operation/functionality
 - a. User accounts and Login
 - b. Player Lookup with Stats/Name
 - c. Team Search
 - d. User Favorite Team/Players
 - e. Game Stats
 - f. Rating system for games
 - g. Team Schedule Viewer
 - h. Users can view other fans

- Business rules
 - i. Teams have players
 - j. Players play in games
 - k. Players have statistics
 - l. Players have fans
 - m. Fans follow favorite teams/players
 - n. Fans can rate a game once
 - o. Games have statistics
 - p. Teams play
 - q. Fans can have multiple favorite teams
 - r. Fans can have many favorite players

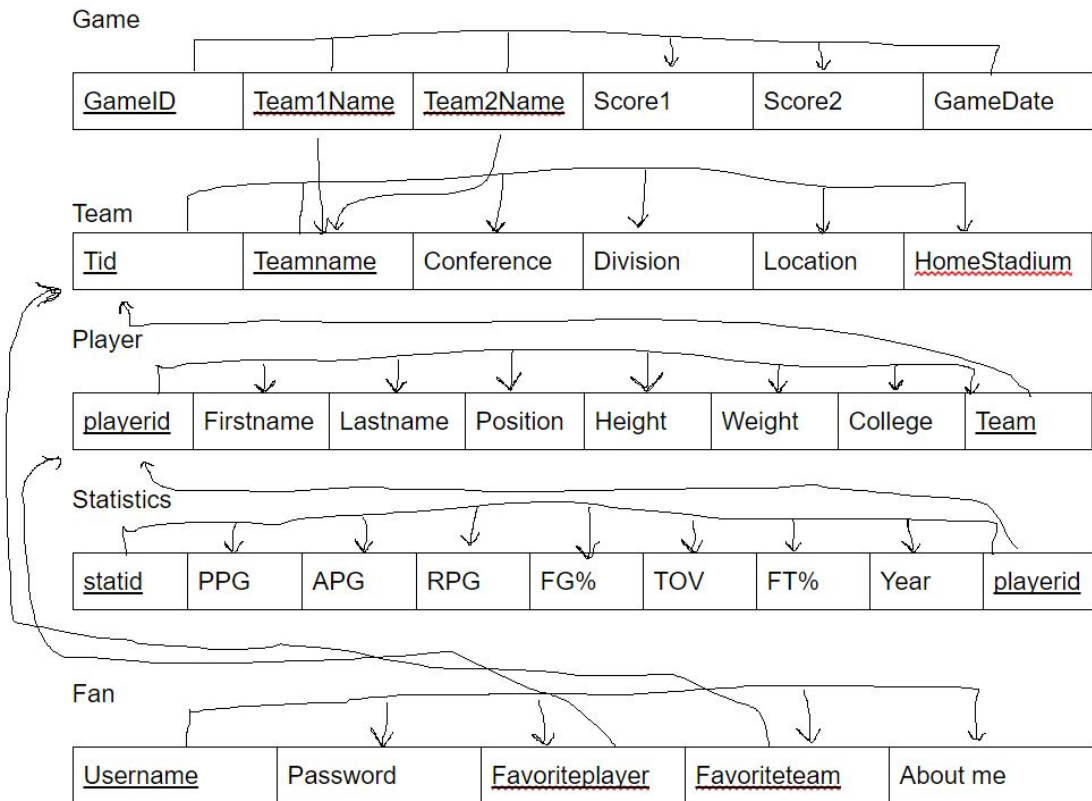
- s. Users must register and sign in to become a “Fan”

3. Database Design

ER Diagram of Database



Relation Schema



Database Tables

Tables:

Team:

		tid	TeamName	Conference	Division	Location	HomeStadium
<input type="checkbox"/>	Edit Copy Delete	12	Atlanta Hawks	Eastern	Southeast	Atlanta, GA	Philips Arena
<input type="checkbox"/>	Edit Copy Delete	0	Boston Celtics	Eastern	Atlantic	Boston, MA	TD Garden

Player:

		playerid	FirstName	LastName	Position	Height	Weight	College	team
<input type="checkbox"/>	Edit Copy Delete	5	LeBron	James	SG	6-8	250	St. Vincent-St. Mary HS	Cleveland Cavaliers
<input type="checkbox"/>	Edit Copy Delete	6	James	Harden	SG	6-5	220	Arizona State	Houston Rockets
<input type="checkbox"/>	Edit Copy Delete	7	Russell	Westbrook	PG	6-3	200	UCLA	Oklahoma City Thunder
<input type="checkbox"/>	Edit Copy Delete	8	Rajon	Rondo	PG	6-1	186	Kentucky	Chicago Bulls
<input type="checkbox"/>	Edit Copy Delete	9	Damian	Lillard	PG	6-3	195	Weber State	Portland Trail Blazers
<input type="checkbox"/>	Edit Copy Delete	10	CJ	McCollum	SG	6-3	190	Lehigh	Portland Trail Blazers
<input type="checkbox"/>	Edit Copy Delete	11	Al	Horford	C	6-10	245	Florida	Boston Celtics
<input type="checkbox"/>	Edit Copy Delete	12	Isaiah	Thomas	G	5-9	185	Washington	Boston Celtics
<input type="checkbox"/>	Edit Copy Delete	13	Giannis	Antetokounmpo	F-G	6-11	222	Greece	Milwaukee Bucks
<input type="checkbox"/>	Edit Copy Delete	14	John	Wall	G	6-4	210	Kentucky	Washington Wizards
<input type="checkbox"/>	Edit Copy Delete	15	Dennis	Schroder	PG	6-1	172	Germany	Atlanta Hawks
<input type="checkbox"/>	Edit Copy Delete	17	Derrick	Favors	F-C	6-10	265	Georgia Tech	Utah Jazz
<input type="checkbox"/>	Edit Copy Delete	18	Brook	Lopez	C	7-0	275	Stanford University	Brooklyn Nets
<input type="checkbox"/>	Edit Copy Delete	19	Kyle	Lowry	G	6-0	205	Villanova	Toronto Raptors
<input type="checkbox"/>	Edit Copy Delete	20	Kemba	Walker	PG	6-1	172	University of Connecticut	Charlotte Hornets
<input type="checkbox"/>	Edit Copy Delete	21	Dirk	Nowitzki	PF	7-0	245	Germany	Dallas Mavericks
<input type="checkbox"/>	Edit Copy Delete	22	LaMarcus	Aldridge	F	6-11	260	Texas	San Antonio Spurs
<input type="checkbox"/>	Edit Copy Delete	23	Darren	Collison	G	6-0	175	UCLA	Sacramento Kings
<input type="checkbox"/>	Edit Copy Delete	24	Kenneth	Faried	PF	6-8	228	Morehead State University	Denver Nuggets
<input type="checkbox"/>	Edit Copy Delete	25	Andre	Drummond	C	6-11	279	University of Connecticut	Detroit Pistons
<input type="checkbox"/>	Edit Copy Delete	26	Eric	Bledsoe	G	6-1	205	Kentucky	Phoenix Suns
<input type="checkbox"/>	Edit Copy Delete	27	Robert	Covington	F	6-9	215	Tennessee State	Philadelphia 76ers
<input type="checkbox"/>	Edit Copy Delete	28	Stephen	Curry	PG	6-3	190	Davidson College	Golden State Warriors
<input type="checkbox"/>	Edit Copy Delete	29	Paul	George	SG	6-9	220	California State University	Indiana Pacers










Statistics:

  	statid	PPG	APG	RPG	FG%	TOV	FT%	BPG	3P%	PER	TS%	GP	year	nba_player
  	136	16.6	5.3	1.2	0.502	2.3	1.2	0.2	5.3	18.8	0.586	26	2014	41
  	120	16.6	3.8	1.1	0.464	2.3	0.829	1.3	0.667	17.7	0.528	52	2015	38
  	70	15.8	1.2	2.7	0.593	2.8	0.528	1.3	0.5	19.2	0.596	41	2014	43
  	52	12.5	1.2	8.7	0.558	1.4	0.613	0.9	0.5	21	0.577	67	2015	24
  	89	16.9	9.7	0.8	0.481	2.3	0.885	0.1	0.481	26.4	0.594	70	2012	31
  	65	30.1	6.7	5.4	0.504	3.3	0.908	0.2	0.454	31.5	0.669	79	2015	28
  	63	23.8	7.7	4.3	0.487	3.1	0.914	0.2	0.443	28	0.638	80	2014	28
  	62	24	8.5	4.3	0.471	3.8	0.885	0.2	0.424	24.1	0.61	78	2013	28
  	67	13.2	4.6	2.3	0.476	1.7	0.86	0.1	0.417	15.3	0.57	68	2016	23
  	85	18.1	9.2	0.7	0.476	2.4	0.892	0.1	0.411	26.2	0.614	61	2016	31
  	66	25.3	6.6	4.5	0.468	3	0.898	0.2	0.411	24.6	0.624	79	2016	28
  	55	17.3	1.9	7.3	0.477	1.4	0.812	1.2	0.411	18.6	0.532	72	2016	22
  	92	8.8	1	0.7	0.367	2	0.727	0.2	0.409	13	0.492	6	2014	29
  	123	20.5	6.3	0.4	0.459	2.3	0.859	0.3	0.407	23.2	0.604	69	2016	39

Fan:

  	Username	Password	AboutMe	FavoritePlayer	FavoriteTeam
  	jwest473	ajh92u83hpjklav92hashed	Stuff about the user goes here. Maximum of 250 wor...	40	Minnesota Timberwolves
  	lowry232	alsjf23ojf09sfhashed	About the user here.	25	Atlanta Hawks

Game:

  	GameID	Team1Name	Team2Name	Score1	Score2	GameDate
  	1	Golden State Warriors	Toronto Raptors	97	92	2016-10-01
  	2	New Orleans Pelicans	Dallas Mavericks	116	102	2016-10-01

GameSchedule:

Team1Name	Team2Name	GameDate	Location	GameID
Golden State Warriors	Toronto Raptors	2016-10-01	San Fransisco, CA	1

Update Trigger:

```
CREATE TRIGGER on_update_team BEFORE UPDATE ON team FOR EACH ROW BEGIN UPDATE fan f SET
f.FavoriteTeam =NEW.TeamName WHERE f.FavoriteTeam = OLD.TeamName; UPDATE player p SET p.team =
NEW.TeamName WHERE p.team =OLD.TeamName; UPDATE GameSchedule SET Team1Name =
NEW.TeamName WHERE OLD.TeamName = Team1Name; UPDATE GameScheduleSET Team2Name =
NEW.TeamName WHERE OLD.TeamName = Team2Name; UPDATE Game SET Team1Name = NEW.TeamName
WHEREOLD.TeamName = Team1Name; UPDATE Game SET Team2Name = NEW.TeamName WHERE
OLD.TeamName = Team2Name; END
```

When a record in the team table is updated, we only care about the primary key TeamName. If this is updated, then all foreign keys that use this value need to also be updated that match.

Delete Trigger:

```
CREATE TRIGGER on_delete_player BEFORE DELETE ON player FOR EACH ROW BEGIN UPDATE fan f SET
f.FavoritePlayer = NULL WHERE f.FavoritePlayer = OLD.playerid; DELETE FROM statistics WHERE nba_player =
OLD.playerid; END
```

Since there is a relationship between players and fans, a player cannot be a fan of a player that is not in the database. Because of this, if a player is deleted, FavoritePlayer keys that match this player will be set to NULL in the fan table. This includes the player's statistics as well in the statistics table except the whole record would be deleted.

View

```
CREATE VIEW teamstats AS
SELECT t.TeamName, AVG(s.---)
FROM team t, player p, statistics s
WHERE t.TeamName = p.team AND p.playerid = s.nba_player
GROUP BY t.TeamName;
```

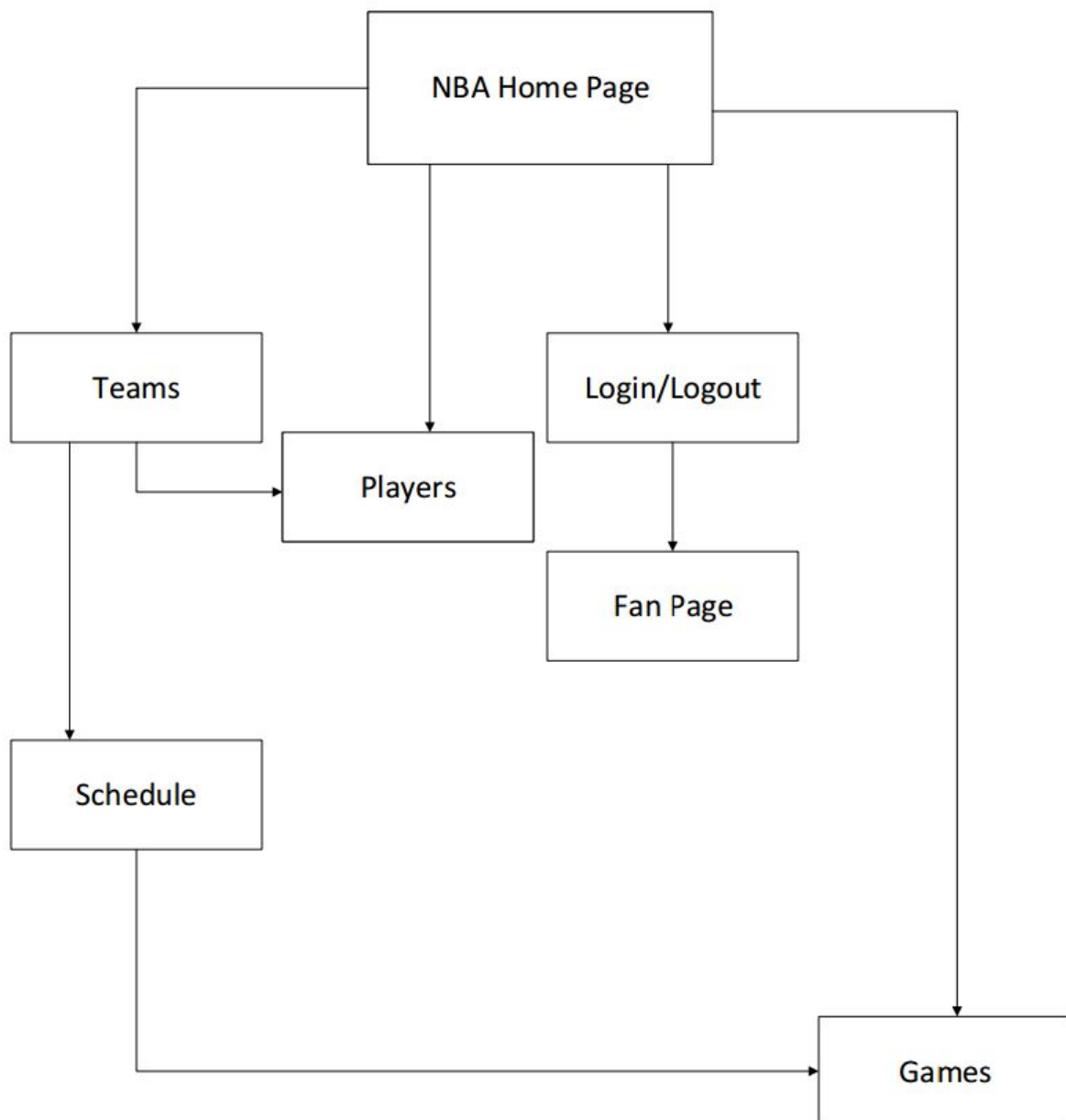
```
CREATE VIEW west AS
SELECT TeamName
FROM team
WHERE Conference = "Western";
```

```
CREATE VIEW east AS
SELECT TeamName
FROM team
WHERE Conference = "Eastern";
```

4. Website Design

Discuss the design of your website.

- **Website Layout**



User Interface

NBA Players

[Home](#) [Teams](#) [Player Statistics](#) [Games](#) [Schedule](#) [Login/Sign-Up](#)

Search Player Name:

Last Name	First Name	Position	Height	Weight	College
James	LeBron	SG	6-8	250	St. Vincent-St. Mary HS
Harden	James	SG	6-5	220	Arizona State
Westbrook	Russell	PG	6-3	200	UCLA
Rondo	Rajon	PG	6-1	186	Kentucky
Lillard	Damian	PG	6-3	195	Weber State
McCollum	CJ	SG	6-3	190	Lehigh
Horford	Al	C	6-10	245	Florida
Thomas	Isaiah	G	5-9	185	Washington
Antetokounmpo	Giannis	F-G	6-11	222	Greece
Wall	John	G	6-4	210	Kentucky
Schroder	Dennis	PG	6-1	172	Germany
Favors	Derrick	F-C	6-10	265	Georgia Tech
Lopez	Brook	C	7-0	275	Stanford University
Lowry	Kyle	G	6-0	205	Villanova
Walker	Kemba	PG	6-1	172	University of Connecticut
Nowitzki	Dirk	PF	7-0	245	Germany
Aldridge	LaMarcus	F	6-11	260	Texas
Collison	Darren	G	6-0	175	UCLA
Faried	Kenneth	PF	6-8	228	Morehead State University
Drummond	Andre	C	6-11	279	University of Connecticut
Bledsoe	Eric	G	6-1	205	Kentucky
Covington	Robert	F	6-9	215	Tennessee State
Curry	Stephen	PG	6-3	190	Davidson College
George	Paul	SG	6-9	220	California State University
Payton	Elfrid	G	6-4	185	Louisiana-Lafayette
Paul	Chris	PG	6-0	175	Wake Forest University
Jordan	DeAndre	C	6-11	265	Texas A&M University
Anthony	Carmelo	F	6-8	240	Syracuse

This page displays all the players in the database. It can be searched with a wildcard search through the SQL command below. This page requires input from users so prepared statements are used to prevent injection attacks.

```
SELECT * FROM player
WHERE FirstName LIKE CONCAT ('%',?,'%') OR LastName
LIKE CONCAT ('%',?,'%')
OR ? LIKE CONCAT (FirstName,' ',LastName)";
```

The default page however with no search shows all the players at once. This is done with the simple SQL select statement shown below.

```
SELECT * FROM player;
```

NBA Player Statistics

[Home](#) [Teams](#) [Players](#) [Games](#) [Schedule](#) [Login/Sign-Up](#)

Boston Celtics ▼

Show Stats

Select Player ▼

Select Player

Horford, Al

Thomas, Isaiah

PPG	APG	BPG	FG%	GP	Year
6.4	3.8	0.1	0.418	78	2006
10.6	5.1	0.2	0.492	77	2007
11.9	8.2	0.1	0.505	80	2008
13.7	9.8	0.1	0.517	81	2009

This page is the player statistics page. The user selects inputs thorough two dropdown menus. The team dropdown menu is first populated with this simple SQL statement below.

```
SELECT TeamName FROM team
```

When the user chooses a team, an AJAX call is made which populates the the player dropdown menu with this SQL statement below. This command is the destination url for the AJAX call. The ? will be filled with the prepared POST variable sent through the AJAX call which is the team name.

```
SELECT * FROM player WHERE team = ? ORDER BY LastName;
```

The user can then choose a player from the player dropdown menu. When this is done, the SQL statement below is called displaying all the stats for the selected player in a HTML table.

```
SELECT * FROM statistics s
        INNER JOIN player p ON s.nba_player = p.playerid
        WHERE s.nba_player = ? ORDER BY s.year
```

NBA Teams

[Home](#) [Players](#) [Player Statistics](#) [Games](#) [Schedule](#) [Login/Sign-Up](#)

Team Name

Atlanta Hawks
Boston Celtics
Brooklyn Nets
Charlotte Hornets
Chicago Bulls
Cleveland Cavaliers
Dallas Mavericks
Denver Nuggets
Detroit Pistons
Golden State Warriors
Houston Rockets
Indiana Pacers
Los Angeles Clippers
Los Angeles Lakers
Memphis Grizzlies
Miami Heat
Milwaukee Bucks
Minnesota Timberwolves
New Orleans Pelicans
New York Knicks
Oklahoma City Thunder
Orlando Magic
Philadelphia 76ers
Phoenix Suns
Portland Trail Blazers
Sacramento Kings
San Antonio Spurs
Toronto Raptors
Utah Jazz
Washington Wizards

This page simply lists all the NBA teams in the database. Each of these teams is clickable leading the user to the player page with players in that clicked team. The SQL command is shown below.

```
SELECT FirstName, LastName FROM player p
      INNER JOIN team t ON p.team = t.TeamName
      ORDER BY LastName;
```

Login/Sign-Up

[Home](#) [Players](#) [Player Statistics](#) [Games](#) [Schedule](#) [Teams](#)

Username: *required
Password: *required (must only be letters)

NOTE: “must only be letters” is a UI bug. The user can enter any characters for their password.

This is where the user can create an account to add favorite teams and players. The SQL INSERT command used is below.

```
INSERT INTO fan (Username,Password) VALUES (?,?)
```

Favourites and Information

[Home](#) [Players](#) [Player Statistics](#) [Games](#) [Schedule](#) [Teams](#) [Logout](#)

Favorite Player ▼

Add Favorite Player

Favorite Team ▼

Add Favorite Team

Some stuff about me

Add About

This page is for logged in users only. They can set their favorite team, favorite player, and other information. The user will be inputting information here. One of the SQL commands for the fields is listed below.

```
UPDATE fan
SET FavoriteTeam = ?
WHERE UserName = ?;
```

NBA Information Home

[Teams](#) [Players](#) [Player Statistics](#) [Games](#) [Schedule](#) [Login/Sign-Up](#)

NBA Home

Home

Page

The home page is the main navigation page. This is the first page that the user sees.

NBA Games

[Home](#) [Players](#) [Player Statistics](#) [Teams](#) [Schedule](#) [Login/Sign-Up](#)

Team 1	Score	Team 2	Score	Date
Golden State Warriors	97	Toronto Raptors	92	2016-10-01
New Orleans Pelicans	116	Dallas Mavericks	102	2016-10-01

Other pages that have yet to be implemented are the schedules page

User Manual or Help page

- On the home page select the login button at the top of the screen to register or login.
- Enter your desired/login credentials and select register or login.
 - Note : If you are registering for an account you will have to login once you have created it.
- You will be redirected to a blank page with a link at the top to “enter member area”
- Click on the button and you will be redirected to the fan page.
- From the fan page you may select your favorite team and player, as well as update your bio.

- You may also click the button “view team fan stats” and see how many fans each team has.
- There is also an option to logout if you would like.
- From there you may view Teams, Player Stats, Players and Games (2017 finals)

- Option 1: Teams
 - From the Teams page you may view the teams from each conference.
 - You can also select the team you like and it will redirect you to the players page with a list of players from that team.

- Option 2: Players
 - From the players page you may search for any player you would like.
 - If you click on the player's name you will be redirected to their statistics

- Option 3: Players Statistics
 - From this page you may select any player you would like and view their stats.
 - Select the player from the dropdown menu and click the button below to view the stats.

- Option 4: Games
 - Here we have just a simple table displaying the results of the games from the 2017 NBA Finals.

5. Application Implementation

- Describe your use of HTML/PHP/CSS/JavaScript/....

The HTML code includes all the parts for each of the web pages in the web application. This includes tables, drop down menus, articles, headers, and lists. Javascript will include all of the server side code. This will include things such as Ajax calls and sessions for logging into the site. The CSS code will control the layout and visuals of the site.

- Discuss your SQL queries

For the player statistics page:

This page is the player statistics page. The user selects inputs thorough two dropdown menus. The team dropdown menu is first populated with this simple SQL statement below.

```
SELECT TeamName FROM team
```

When the user chooses a team, an AJAX call is made which populates the the player dropdown menu with this SQL statement below. This command is the destination url for the AJAX call. The ? will be filled with the prepared POST variable sent through the AJAX call which is the team name.


```
SELECT * FROM player WHERE team = ? ORDER BY LastName;
```

The user can then choose a player from the player dropdown menu. When this is done, the SQL statement below is called displaying all the stats for the selected player in a HTML table.

```
SELECT * FROM statistics s
        INNER JOIN player p ON s.nba_player = p.playerid
        WHERE s.nba_player = ? ORDER BY s.year
```

For the Teams page:

This page simply lists all the NBA teams in the database. Later on, each of these teams will be clickable leading the user to the player page with players in that clicked team. The SQL command is shown below.

```
SELECT FirstName, LastName FROM player p
        INNER JOIN team t ON p.team = t.TeamName
        ORDER BY LastName;
```

6. Evaluation

We test our application while implementing, so you could be sure that things work. We all gone to the website and played around with it after we are done. Gave the URL of the website to a friend that's studying CS290 and had him evaluated our website. We also tested multiple inputs from the user whether they were bad inputs or good inputs.

7. Future Work & Lessons learned

Additional Functionalities:

Schedule Page: Shows the future games, locations, etc.

Discussion Board: We could have discussion board for games and players since there isn't much a player could do currently.

Shop: For users/fans to buy basketball related and even more.

Using an API to get all the stats, teams, and players would be a must in future work.

Formatting the list of teams with fans better

Page that shows team stats for

Problems we ran into:

One problem we ran into was getting the login to work. For some reason, the session would always change when a user navigated to a different page. We did a lot of research and finally found out that the redirection after the user logged in was killing the session for some reason. We were using Javascript to do the redirection. Another problem was that the drop down menu was not registering properly on the members page. This was when the user was choosing his/her favorite player. The player ID was not passing to the query properly.

How we solved it:

To fix this, we took out the redirection Javascript code and just made a link that the user would click to redirect them to the member's page. This prevented the session from being killed for each redirect done. The favorite player drop down menu is still currently being looked into. The favorite team drop down and about me text field are working great.

What might we do differently:

We would use an API instead of manually typing all the players into the database. This was a long and tedious process and using an API would be much better. In addition to be less work, an API would generate every single player and all their stats so we would be missing nothing in our database. Right now, there are many players in are database that are missing but an API would fix this. We would parse the json file and add all the players using a query with a for loop from there.

8. Team Report

Labor split: For the parts that we turned in weekly, the labor depends on the amount of time that we have during those weeks. One of us could be very busy during a week, and he contribute less and others contributed more. All of us contributed on most of these parts to the project. For the final production of the website, we picked the task that we are comfortable with and worked on it.