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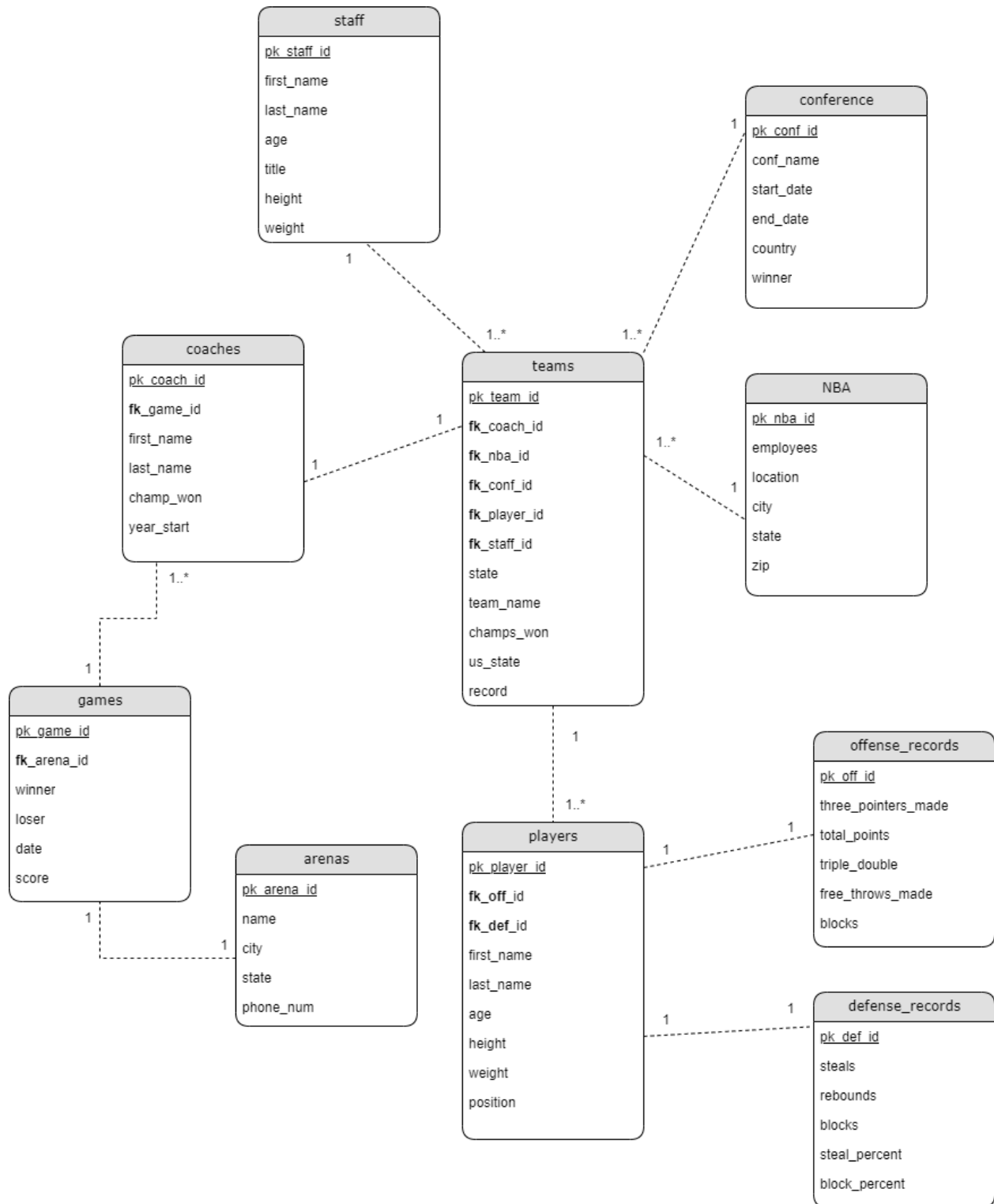
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Introduction/Abstract

The main purpose of this database is to give general information about teams in the NBA to those who want to learn more information about the team they want to search through. A business rule that I will include is camelcase along with underscores to separate two words. The entities for this database will include the NBA, the individual teams, players, offensive stats table, coaches, arenas, and games. Some basic relationships would be the team and its players. One team can have many players while a player can be on one team so it would be a one-to-many relationship. The target audience for this database is those who have an interest in basketball along with those who would like to learn more about an individual player. One benefit of this database is that it congregates information about several players, teams, and coaches. It can also search up how many championships a team has won, how many championships a coach has won with the team, and many more.

UML-Compliant E-R Model



Business Rules

Entity 1	Entity 2	Cardinality on Entity 1 side	Cardinality on Entity 2 side	Business Rule(s)
nba	teams	1	1..*	The NBA has one or many teams. A team belongs to the NBA
teams	conference	1..*	1	One team could only belong to one conference. One conference can have many teams.
teams	staff	1..*	1	One team can have 1 or more staff. Staff can only belong to one team.
teams	coaches	1	1	One team can only have one coach. One coach can only belong to one team
teams	players	1	1..*	One team consists of one or many players. A player can play for one team.
coaches	games	1..*	1	One game can have one or more coaches. Coaches can only be present in one game.
games	arenas	1	1	One game can only have one arena. One arena can only have one game
players	offense_records	1	1	One player can have one offense record. One offense record belongs to one player
Players	defense_records	1	1	One player can have one defense record. One defense record belongs to one player

Entity/Attribute Description

nba		
pk_nba_id	INT	Primary key of the NBA table.
employees	INT	Number of employees in the NBA
location	varchar(45)	Location of the NBA headquarters.
city	varchar(45)	City name of the NBA headquarters.
us_state	varchar(45)	State name.
zip	INT	Zip code of NBA headquarters.

conference		
pk_conf_id	INT	Primary key of the conference table.
conf_name	varchar(45)	Conference name.
start_date	DATE	Start date of the conference.
end_date	DATE	End date of the conference.
country	varchar(45)	Country where the conference is located at.
winner	varchar(45)	Winner of the conference.

teams		
pk_team_id	INT	Primary key of the teams table.
fk_coach_id	INT	Foreign key of the coaches table.
fk_nba_id	INT	Foreign key of the nba table.
fk_player_id	INT	Foreign key of the players table.
fk_staff_id	INT	Foreign key of the staff table.
fk_conf_id	INT	Foreign key of the conference table.
city	varchar(45)	City of where the team is located.
team_name	varchar(45)	Team name.
champs_won	INT	Number of championships won by that team.

us_state	varchar(45)	State of where the team is located at.
record	varchar(45)	Record of the team.

staff		
pk_staff_id	INT	Primary key of the staff table.
first_name	varchar(45)	First name of the staff.
last_name	varchar(45)	Last name of the staff.
age	varchar(45)	Age of the staff.
title	varchar(45)	Title of the staff.
height	varchar(45)	Height of the staff in inches.
weight	varchar(45)	Weight of the staff in pounds (lbs.).

players		
pk_player_id	INT	Primary key of the players table.
fk_off_id	INT	Foreign key of the offense records table.
fk_def_id	INT	Foreign key of the defense records tables.
first_name	varchar(45)	First name of the player.
last_name	varchar(45)	Last name of the player.
Age	INT	Age of the player.
height	INT	Height of the player in inches.
Weight	INT	Weight of the player in pounds (lbs.)
position	varchar(45)	Position of the player.

coaches		
pk_coach_id	INT	Primary key of the coaches table.
fk_game_id	INT	Foreign key of the games table.
first_name	varchar(45)	First name of the coach.
last_name	varchar(45)	Last name of the coach.

champ_won	INT	Number of championships won by the coach.
year_start	INT	Year when the coach started coaching.

games		
pk_game_id	INT	Primary key of the games table.
fk_arena_id	INT	Foreign key of the arenas table.
winner	varchar(45)	Winner of the game.
loser	varchar(45)	Loser of the game.
date	DATE	Date of the game.
score	varchar(45)	Score of the game.

arenas		
pk_arena_id	INT	Primary key of the arenas table.
name	varchar(45)	Name of the arena.
city	varchar(45)	City where the arena is located.
state	varchar(45)	State where the arena is located.
phone_num	varchar(45)	Phone number of the arena.

offense_records		
pk_off_id	INT	Primary key of the offense records table.
three_pointers_made	INT	Number of three-pointers made by a player.
total_points	INT	Total number of points made by a player.
triple_doubles	INT	Number of triple-doubles a player has.
free_throws_made	INT	Number of free throws made by a player.
double_doubles	INT	Number of double-doubles a player has.

defense_records		
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pk_def_id	INT	Primary key of the defense records table.
steals	INT	Number of steals a player has.
rebounds	INT	Number of rebounds a player has.
blocks	INT	Number of blocks a player has.
steal_percent	DECIMAL(8)	Percentage of steals that a player has.
block_percent	DECIMAL(8)	Percentage of blocks that a player has.

List of Questions

1) SELECT

a) What teams are in the NBA?

- i) To those who don't know anything about the NBA and its teams, this query would show all the teams within the database of the NBA that I had created.

446 • `SELECT*FROM teams;`

Result Grid

Filter Rows:

Edit:

Export/Import:

Wrap Cell Content:

	pk_team_id	fk_coach_id	fk_nba_id	fk_conf_id	fk_player_id	fk_staff_id	city	team_name	champs_won	us_state	record
11	1	1	1	1	1	1	Chicago	Chicago Bulls	6	Illinois	46-36
12	2	1	1	1	2	2	Miami	Miami Heat	3	Florida	53-29
13	3	1	1	1	3	3	Philadelphia	Philadelphia 76ers	3	Pennsylvania	51-31
14	4	1	1	1	4	4	Brooklyn	Brooklyn Nets	2	New York	44-38
15	5	1	2	2	5	5	Salt Lake City	Utah Jazz	0	Utah	49-33
16	6	1	2	2	6	6	New Orleans	New Orleans Pelicans	0	Louisiana	36-46
17	7	1	2	2	7	7	San Francisco	Golden State Warriors	6	California	53-29
18	8	1	1	1	8	8	Boston	Boston Celtics	17	Massachusetts	51-31
19	9	1	2	2	9	9	Los Angeles	Los Angeles Lakers	17	California	33-49
20	10	1	2	2	10	10	Phoenix	Phoenix Suns	0	Arizona	64-18
*	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

b) Who plays in the NBA in the database?

- i) This query shows the user general information about the players in the NBA.

402 • `SELECT * FROM players;`

Result Grid Filter Rows: Edit: Export/Import: Wrap Cell									
	pk_player_id	fk_off_id	fk_def_id	first_name	last_name	age	height	weight	position
▶	1	1	1	Derrick	Webb	22	75	190	guard
	2	2	2	Allen	Johnson	21	78	180	guard
	3	3	3	Dwayne	Lee	23	73	185	guard
	4	4	4	Joe	Shmo	19	82	225	power forward
	5	5	5	Rickey	Begum	27	80	215	power forward
	6	6	6	Eathan	Savage	32	76	184	guard
	7	7	7	Barnaby	McArthur	28	84	230	center
	8	8	8	Usman	Griffin	24	86	232	center
	9	9	9	Aran	Decker	22	87	245	center
	10	10	10	Amos	Lozano	27	79	196	guard
*	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

2) INNER JOIN

a) Who coaches the teams in the NBA?

- i) This query shows the coaches in the NBA and what teams the coach works for.

```

412 • SELECT t.team_name as Team_Name, c.first_name as Coach_First_Name, c.last_name as Coach_Last_Name
413 FROM coaches c
414 INNER JOIN teams t ON c.pk_coach_id = t.fk_coach_id;
415

```

Result Grid Filter Rows: Export: Wrap Cell Content:			
	Team_Name	Coach_First_Name	Coach_Last_Name
▶	Chicago Bulls	Bob	Ross
	Miami Heat	Joe	Willow
	Philadelphia 76ers	Mark	Cube
	Brooklyn Nets	Steve	Leo
	Utah Jazz	Rob	Pots
	New Orleans Pelicans	Jason	West
	Golden State Warriors	Chris	Johnson
	Boston Celtics	Alex	Rochester
	Los Angeles Lakers	Frank	Cunningham
	Phoenix Suns	Cliff	Brown

b) How many three-pointers do the players have?

- i) This answers the question of how many three-pointers the players within the database made.

```

416 • SELECT p.first_name as First_name, p.last_name as Last_Name, o.three_pointers_made as '3 pts made'
417 FROM players p
418 INNER JOIN offense_records o ON o.pk_off_id = p.fk_off_id;

```

Result Grid Filter Rows: Export: Wrap Cell Content:			
	First_name	Last_Name	3 pts made
▶	Derrick	Webb	432
	Allen	Johnson	636
	Dwayne	Lee	852
	Joe	Shmo	120
	Rickey	Begum	218
	Eathan	Savage	265
	Barnaby	McArthur	0
	Usman	Griffin	0
	Aran	Decker	2
	Amos	Lozano	169

3) LEFT JOIN

- a) In what city and state are the arenas located?
- i) This query allows the user to know what stadiums and arenas are located in the US and its name.

```

421 • SELECT a.name AS Arena_Name, a.city AS City, a.state AS State
422 FROM arenas a
423 LEFT JOIN games g on g.fk_arena_id =a.pk_arena_id;

```

Result Grid Filter Rows: Export: Wrap Cell Content:			
	Arena_Name	City	State
▶	PNC Arena	Chicago	Illinois
	Spearhead Arena	Philadelphia	Pennsylvania
	JP Arena	Miami	Florida
	PPJ Center	Brooklyn	Ney York
	Spirit Arena	Salt Lake City	Utah
	Vista Stadium	New Orleans	Louisiana
	Anaheim Center	San Francisco	California
	PayNow Arena	Boston	Massachusetts
	Delta Center	Los Angeles	California
	FootPrint Center	Phoenix	Arizona

- b) What staff members are on each team?
- i) This displays other staff members on a team other than the coach.

```

425 • SELECT s.first_name as 'First Name', s.last_name as 'Last Name', s.title as 'Title', t.team_name as 'Team'
426 FROM staff s
427 LEFT JOIN teams t ON t.fk_staff_id = s.pk_staff_id;
428

```

Result Grid	Filter Rows:	Export:	Wrap Cell Content:
First Name	Last Name	Title	Team
John	Doe	human resources	Chicago Bulls
Leon	Kennedy	accountant	Miami Heat
Steve	Putman	social media coordinator	Philadelphia 76ers
Barbara	Smith	intern	Brooklyn Nets
Destiny	Johnson	director of mind, health, and wellness	Utah Jazz
Marceline	Potter	physical therapist	New Orleans Pelicans
Bob	Nutt	member experience executive	Golden State Warriors
Zeke	Jeager	athletic trainer	Boston Celtics
Armin	Artfelt	video producer	Los Angeles Lakers
Mikasa	Ackerman	intern	Phoenix Suns

4) AVG and COUNT

a) What is the number of coaches that had won championships?

i) This query displays the number of championships and the number of coaches won.

```

429 • SELECT avg(c.champ_won) AS 'Number of titles won', COUNT(c.first_name) as 'Number of Coaches'
430 FROM coaches c
431 GROUP BY c.champ_won;
432

```

Result Grid

Filter Rows:

Export:

Wrap Cell Content:

	Number of titles won	Number of Coaches
▶	6.0000	1
	3.0000	3
	2.0000	2
	0.0000	3
	5.0000	1

b) How many teams in the NBA have a certain number of titles?

i) This query displays information on the number of teams that have won a certain number of championships.

```

438 #How many Teams in the NBA have a certain number of championship titles?
439 • SELECT COUNT(t.team_name) AS Number_of_Teams, t.champs_won AS Championships_Won
440 FROM teams t
441 GROUP BY t.champs_won;
442

```

Result Grid

Filter Rows:

Export:

Wrap Cell Content:

	Number_of_Teams	Championships_Won
2	6	
2	3	
1	2	
3	0	
2	17	

5) GROUP BY

- a) How many players in the database have less than 250 points?
- i) This query displays how many players in the database have less than 250 total points and how many players have that specific point.

```

443 • SELECT COUNT(p.first_name) as 'Number of Players', o.total_points AS 'Total Points'
444 FROM players p
445 JOIN offense_records o ON o.pk_off_id = p.fk_off_id
446 GROUP BY p.first_name
447 HAVING o.total_points <=250;
448

```

Result Grid Filter Rows: <input type="text"/> Export: Wrap Cell Content:		
	Number of Players	Total Points
▶	1	235
	1	110
	1	206

6) HAVING

- a) What teams in the NBA have less than or equal to 6 championship titles?
- i) The query displays information on what teams have 6 or fewer championship titles in their organization.

```

443 #What teams in the nba have less than or equal to 6 championship titles?
444 • SELECT t.team_name,t.champs_won
445 FROM teams t
446 HAVING t.champs_won <= 6;
447

```

Result Grid Filter Rows: <input type="text"/> Export: Wrap Cell Content:		
	team_name	champs_won
▶	Chicago Bulls	6
	Miami Heat	3
	Philadelphia 76ers	3
	Brooklyn Nets	2
	Utah Jazz	0
	New Orleans Pelicans	0
	Golden State Warriors	6
	Phoenix Suns	0

- b) What are the coaches that won a championship title that is between 2 and 5 titles and what team did they coach?
- i) This displays information on the specific coach that has won a championship title and the number of titles is between 2 and 5. It also displays the team that the coach coaches now in the database.

```

456 • SELECT c.first_name as 'First Name', c.last_name as 'Last Name', c.champ_won as '# of Titles', t.team_name as 'Team
457 FROM coaches c
458 JOIN teams t ON t.fk_coach_id = c.pk_coach_id
459 GROUP BY c.champ_won
460 HAVING c.champ_won >=2 AND c.champ_won<=5;

```

Result Grid	Filter Rows:	Export:	Wrap Cell Content:	Result Grid	Form Editor
First Name	Last Name	# of Titles	Team Name		
Joe	Willow	3	Miami Heat		
Steve	Leo	2	Brooklyn Nets		
Alex	Rochester	5	Boston Celtics		

7) ORDER BY

a) What players have the least amount of blocks in their career and what is their position?

i) This query shows the players' first name, last name, position, and the number of blocks they currently have from lowest to greatest.

```

467 • SELECT p.first_name AS 'First Name', p.last_name AS 'Last Name', d.blocks as '# of Blocks', p.position AS 'Position
468 FROM players p
469 JOIN defense_records d ON d.pk_def_id = p.fk_def_id
470 ORDER BY d.blocks asc;
471

```

Result Grid	Filter Rows:	Export:	Wrap Cell Content:	Result Grid	Form Editor	Field Types
First Name	Last Name	# of Blocks	Position			
Aran	Decker	39	center			
Joe	Shmo	63	power forward			
Amos	Lozano	92	guard			
Allen	Johnson	120	guard			
Barnaby	McArthur	172	center			
Dwayne	Lee	198	guard			
Derrick	Webb	201	guard			
Rickey	Begum	208	power forward			
Usman	Griffin	273	center			
Eathan	Savage	372	guard			

8) LIMIT

a) What are the bottom 3 teams in the database that have the most championships listed by ascending order?

i) This query shows the bottom 3 teams in the database in an ascending order

```

473 • SELECT t.team_name AS Team_Name, t.champs_won AS Champs_Won, t.city AS City
474 FROM teams t
475 ORDER BY t.champs_won asc
476 LIMIT 4;

```

Result Grid	Filter Rows:	Export:	Wrap Cell Content:	Fetch rows:
Team_Name	Champs_Won	City		
Utah Jazz	0	Salt Lake City		
New Orleans Pelicans	0	New Orleans		
Phoenix Suns	0	Phoenix		
Brooklyn Nets	2	Brooklyn		

9) SUBQUERY using IN predicament

a) What games are recorded in the database and who was the winner and loser of the game? Where did it take place and what was the score?

i) The query shows the games of the database recorded along with the scores, winners, losers, dates, and the city the game took place in.

```
483 • SELECT g.winner AS 'Winner', g.loser as 'Loser', g.date as 'Date' , g.score as "Score", g.city as "City"
484 FROM games g
485 WHERE city IN (SELECT city FROM arenas );
```

Result Grid					
Filter Rows: <input type="text"/>					
Export:					
Wrap Cell Content:					
Winner	Loser	Date	Score	City	
Warriors	Celtics	2000-12-25	115-98	San Francisco	
Celtics	Raptors	2013-11-25	116-110	Boston	
Suns	Mavericks	2017-11-11	101-99	Phoenix	
Bulls	Lakers	1989-12-24	86-85	Chicago	
76ers	Nets	2001-02-12	107-96	Brooklyn	
Heat	Spurs	2008-08-22	99-98	Miami	
Lakers	Heat	2001-06-19	91-85	Los Angeles	
Pelicans	Suns	2021-01-05	130-129	New Orleans	
Warriors	Celtics	2000-12-25	115-98	San Francisco	
Celtics	Raptors	2013-11-25	116-110	Boston	
Suns	Mavericks	2017-11-11	101-99	Phoenix	

Closing

My experience with this project has been overall pretty well. I did have a lot of problems at the very start of creating and inserting values into the database. I had a problem inserting data values into a table with a foreign key along with updating or adding a value into a child table. The easiest part of the database was creating the entities along with the attributes. Creating relationships was easy for the most part. In addition to problems, I had to understand how left join, inner join, and using a subquery works again because those were always confusing to me. Compared to the beginning of the semester, my knowledge of SQL and databases has grown and I was surprised that it kinda came easy to me but with some hardships along the way. Overall, my experience with this project turned out very well.