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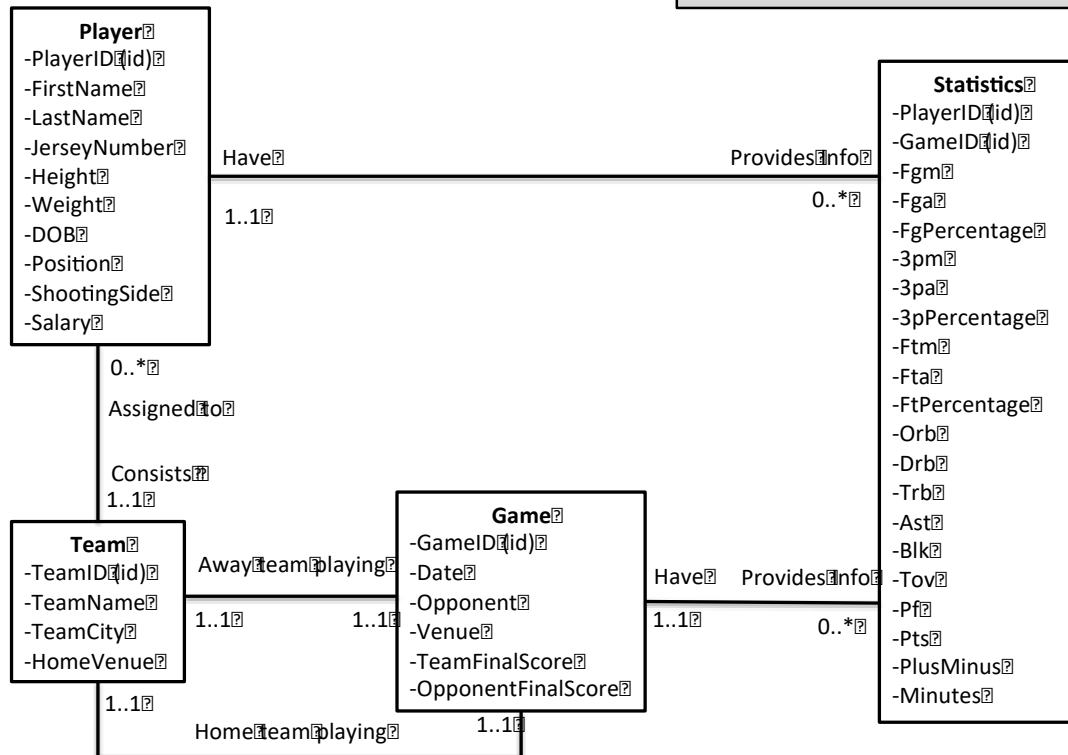
**Group 13**

**Basketball Statistics Final Report**

**Description:** NBA team statistics. We will maintain a database that keeps track of individual player statistics for all members of the New York Knicks throughout the 2016-2017 season. By keeping track of individual player statistics for the team, we can analyze the data to determine the efficiency and impact of the player's abilities and contribution to the team.

**Information:** We will obtain and use information from a reliable source, [www.basketball-reference.com](http://www.basketball-reference.com), a website that keeps track of statistics for every team in the NBA. We will obtain valuable data such as field goal percentages, assists per game, rebounds per game, blocks per game, steals per game statistics to determine how well the players are doing. With these essential information, we can identify the problems that are holding back the team from success. We can find out where the team is striving at and what they need to fix.

Model: Basketball Statistics - Project  
 Creation Date/Time: April 19, 2017 3:46 PM  
 Modified Date/Time: May 22, 2017 1:40 PM  
 Last Modified by: Honda Huang



## Converting ER model into a relational model

-Statistic (PlayerID (key), GameID (key), Fgm, Fga, FgPercentage, 3pm, 3pa, 3pPercentage, Ftm, Fta, FtPercentage, Orb, Drb, Trb, Ast, Blk, Tob, Pf, Pts, PlusMinus, Minutes)

-Player (PlayerID (key), FirstName, LastName, JerseyNumber, Height, Weight, DOB, Position, ShootingSide, Salary)

-Active\_Roster (RosterID (key), StartingLineup, PlayerID (fk), TeamID (fk))

-Team (TeamID (key), TeamName, TeamCity, HomeVenue)

-Game (GameID (key), Date, Venue, HomeTeamFinalScore, VisitorTeamFinalScore, Home\_TeamID (fk), Visitor\_TeamID (fk),)

## Normalize

- 1) **Statistics** (PlayerID (key)(fk), GameID (key)(fk), Fgm, Fga, FgPercentage, 3pm, 3pa, 3pPercentage, Ftm, Fta, FtPercentage, Orb, Drb, Trb, Ast, Blk, Tov, Pf, Pts, PlusMinus, Minutes)

**Key:** PlayerID, GameID

**FD1:** PlayerID, GameID -> Fgm, Fga, FgPercentage, 3pm, 3pa, 3pPercentage, Ftm, Fta, FtPercentage, Orb, Drb, Trb, Ast, Blk, Tov, Pf, Pts, PlusMinus, Minutes

**FD2:** Fgm, Fga -> FgPercentage

**FD3:** 3pm, 3pa -> 3pPercentage

**FD4:** Ftm, Fta -> FtPercentage

**FD5:** Orb, Drb -> Trb

(1NF: Yes, well defined key and meets all 6 criteria of a relation.)

(2NF: Yes, key is a single attribute and does not involve partial key dependency.)

(3NF: No, it contains transitive dependencies.)

**Statistics** (PlayerID (key)(fk), GameID (key)(fk), Ast, Blk, Tov, Pf, Pts, PlusMinus, Minutes)

**Key:** PlayerID, GameID

**FD1:** PlayerID, GameID -> Ast, Blk, Tov, Pf, Pts, PlusMinus, Minutes

**Field Goal Statistics**

**Key:** Ftm, Fta

**FD1:** Ftm, Fta -> FtPercentage

**3 pointer Statistics** (3pm, 3pa, 3pPercentage)

**Key:** 3pm, 3pa

**FD1:** 3pm, 3pa -> 3pPercentage

**Free Throw Statistics** (Fgm, Fga, FgPercentage)

**Key:** Fgm, Fga

**FD1:** Fgm, Fga -> FgPercentage

**Rebound Statistics** (Orb, Drb, Trb)

**Key:** Orb, Drb

**FD1:** Orb, Drb -> Trb

(1NF: Yes, well defined key and meets all 6 criteria of a relation.)

(2NF: Yes, key is a single attribute and does not involve partial key dependency.)

(3NF: Yes, it is in 2NF and contains no transitive dependencies.)

- 2) **Player** (PlayerID (key), FirstName, LastName, JerseyNumber, Height, Weight, DOB, Position, ShootingSide, Salary, TeamID (fk))

**Key:** PlayerID

**FD1:** PlayerID -> FirstName, LastName, JerseyNumber, Height, Weight, DOB, Position, ShootingSide, Salary, TeamID

(1NF: Yes, well defined key and meets all 6 criteria of a relation.)  
(2NF: Yes, key is a single attribute and does not involve partial key dependency.)  
(3NF: Yes, it is in 2NF and contains no transitive dependencies.)

3) **Team** (TeamID (key), TeamName, TeamCity, HomeVenue)

**Key:** TeamID

**FD1:** TeamID -> TeamName, TeamCity, HomeVenue

(1NF: Yes, well defined key and meets all 6 criteria of a relation.)  
(2NF: Yes, key is a single attribute and does not involve partial key dependency.)  
(3NF: Yes, it is in 2NF and contains no transitive dependencies.) d

4) **Game** (GameID (key), Home\_TeamID (fk), Visitor\_TeamID (fk), Date, Venue, HomeTeamFinalScore, VisitorTeamFinalScore)

**Key:** GameID, Home\_TeamID (fk), Visitor\_TeamID (fk)

**FD1:** GameID, Home\_TeamID (fk), Visitor\_TeamID (fk) -> Date, Venue, HomeTeamFinalScore, VisitorTeamFinalScore

(1NF: Yes, well defined key and meets all 6 criteria of a relation.)  
(2NF: Yes, key is a single attribute and does not involve partial key dependency.)  
(3NF: Yes, it is in 2NF and contains no transitive dependencies.)

```
CREATE TABLE Player
( PlayerID INTEGER NOT NULL,
  FirstName VARCHAR(35),
  LastName VARCHAR(35),
  JerseyNumber INTEGER,
  Height NUMBER,
  Weight NUMBER,
  DOB DATE,
  Position VARCHAR(30),
  ShootingSide VARCHAR(20),
  Salary NUMBER
);
ALTER TABLE Player
ADD CONSTRAINT pk_player
PRIMARY KEY (PlayerID);
```

```
CREATE TABLE Team
(
  TeamID INTEGER NOT NULL,
  TeamName VARCHAR(35),
  TeamCity VARCHAR(35),
  HomeVenue VARCHAR(25)
);
ALTER TABLE Team
ADD CONSTRAINT pk_team
PRIMARY KEY (TeamID);
```

```
CREATE TABLE Game
(
  GameID INTEGER NOT NULL,
  Date DATE NOT NULL,
  Venue SHORT TEXT NOT NULL,
  Opponent SHORT TEXT NOT NULL
);
```

```
ALTER TABLE Game
ADD CONSTRAINT pk_game
PRIMARY KEY (GameID);
```

```
ALTER TABLE Game
ADD CONSTRAINT fk_VisitorTeamID
FOREIGN KEY (VisitorTeamID)
REFERENCES Player (VisitorTeamID);
```

```
ALTER TABLE Game
ADD CONSTRAINT fk_HomeTeamID
FOREIGN KEY (HomeTeamID)
REFERENCES Team (HomeTeamID);
```

## Queries

### Each Player's Highest Score of the Season

FirstName	LastName	HighestScore
Brandon	Jennings	24
Carmelo	Anthony	31
Courtney	Lee	17
Derrick	Rose	21
Joakim	Noah	16
Justin	Holiday	16
Kristaps	Porzingis	28
Kyle	O'Quinn	11
Lance	Thomas	7
Maurice	Ndour	4
Mindaugas	Kuzminskas	7
Ron	Baker	5
Sasha	Vujacic	4
Willy	Hernangomez	14

### Knicks Player's Average Salary

KnicksAverageSalary
\$7,205,960.29

### Knicks Players' DOB and Age

FirstName	LastName	DOB	Age
Kristaps	Porzingis	8/2/1995	21.8
Carmelo	Anthony	5/29/1984	33.0
Derrick	Rose	10/4/1988	28.7
Courtney	Lee	10/3/1985	31.7
Joakim	Noah	2/25/1985	32.3
Justin	Holiday	4/5/1989	28.2
Brandon	Jennings	9/23/1989	27.7
Lance	Thomas	4/24/1988	29.1
Kyle	O'Quinn	3/26/1990	27.2
Willy	Hernangomez	5/27/1994	23.0
Mindaugas	Kuzminskas	10/19/1989	27.6
Ron	Baker	3/30/1993	24.2
Sasha	Vujacic	3/8/1984	33.2

Knicks Players' DOB and Age			
FirstName	LastName	DOB	Age
Maurice	Ndour	6/18/1995	21.9

#### Knicks Players who play Guard Position

FirstName	LastName	Position
Derrick	Rose	PG
Courtney	Lee	SG
Justin	Holiday	SG
Brandon	Jennings	PG
Ron	Baker	SG
Sasha	Vujacic	SG

#### Knicks Players with Salaries over \$10,000,000

PlayerID	FirstName	LastName	Salary
P002	Carmelo	Anthony	\$24,559,380
P003	Derrick	Rose	\$21,323,252
P004	Courtney	Lee	\$11,242,000
P005	Joakim	Noah	\$17,000,000

#### Number of Games with over 15 points scored by a player

FirstName	LastName	GamesWithMoreThan15Points
Brandon	Jennings	1
Carmelo	Anthony	9
Courtney	Lee	3
Derrick	Rose	5
Joakim	Noah	1
Justin	Holiday	1
Kristaps	Porzingis	7



Player's Average Points in Home Games			
PlayerID	FirstName	LastName	AveragePointsInHomeGames
P001	Kristaps	Porzingis	18.25
P002	Carmelo	Anthony	23
P003	Derrick	Rose	12.8
P004	Courtney	Lee	12.4
P005	Joakim	Noah	2.4
P006	Justin	Holiday	6.8
P007	Brandon	Jennings	6.2
P008	Lance	Thomas	5
P009	Kyle	O'Quinn	4.8
P010	Willy	Hernangomez	7.33333333333333
P011	Mindaugas	Kuzminskas	4.5
P012	Ron	Baker	2
P013	Sasha	Vujacic	3
P014	Maurice	Ndour	3.33333333333333

#### Players who shoot left-sided

PlayerID	FirstName	LastName
P007	Brandon	Jennings

## Forms

Game Form to add games played

Game

GameID

201

Date

10/25/2016

Opponent

T02

Venue


Quicken Loans Arena

TeamFinalScore

88

OpponentFinalScore

117



Player Form to add players

Player

PlayerID

2001

TeamID

T12

FirstName

Kristaps

LastName

Porzingis

JerseyNumber

6

Height

7' 3"

Weight

240

DOB

8/2/1995

Position


PF

ShootingSide

Right

Salary

\$4,317,720



## Statistics Form to add Player Statistics

Statistics

GameID

G01

PlayerID

P001

MinutesPlayed

8:48

FGM

5

FGA

13

FGPercentage

0.385

3PM

3

3PA

5

3PPercentage

0.600

FTM

3

FTA

6

FTPercentage

0.500

ORB

4

DRB

3

TRB

7

AST

0

STL

1

BLK


2

TOV

2

PF

5



Navigation Form

Game

Players

Stats Entry

Game

GameID

G01

Date

10/25/2016

Opponent

T02

Venue


Quicken Loans Arena

TeamFinalScore

88

OpponentFinalScore

117



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