

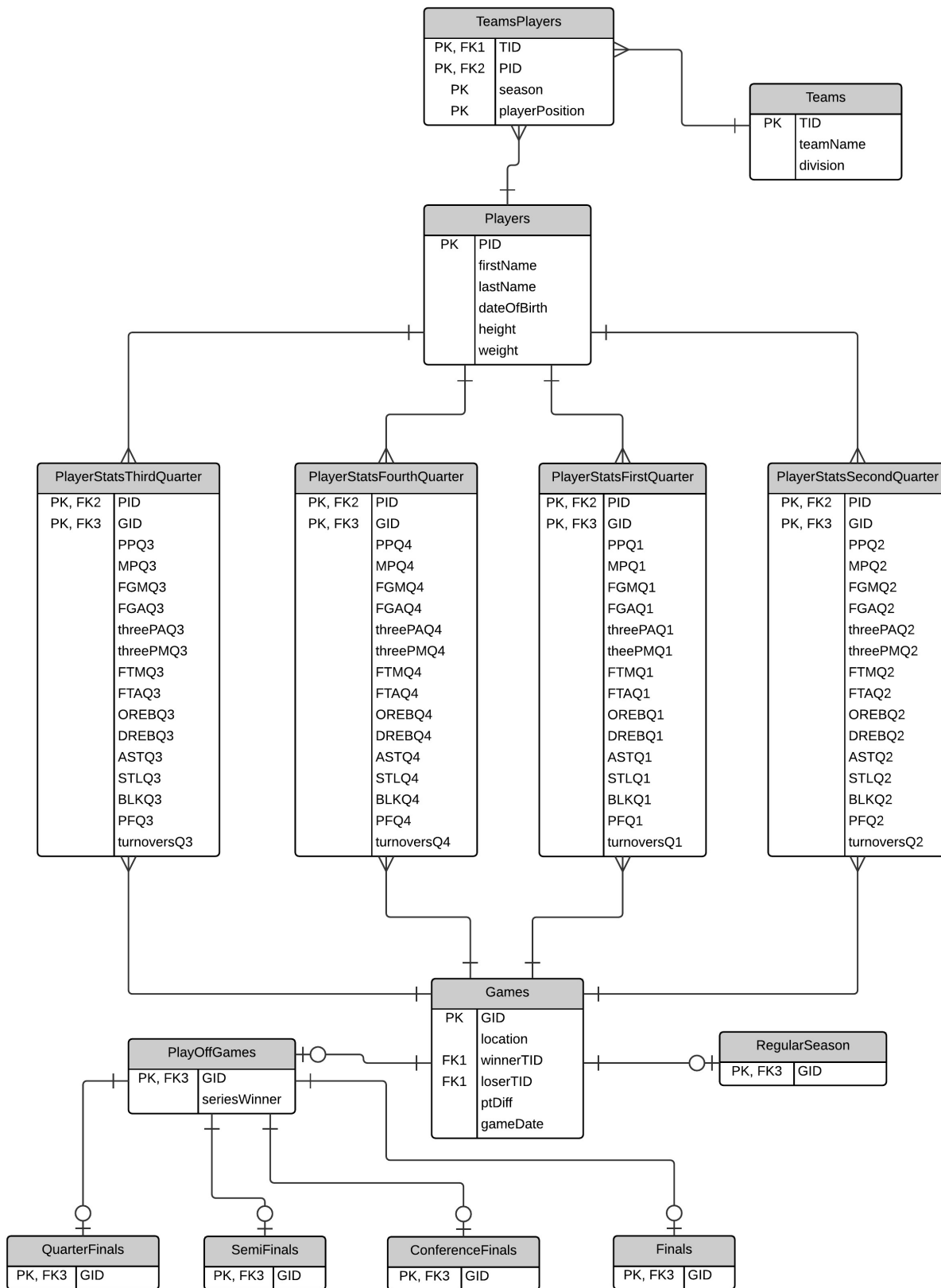
For the Love of Databases and Basketball



Executive Summary

This database was designed to help agents, coaches, and general managers have an in depth look at players' statistics so they know who'll go well on their team. The users will be able to see a player's stats per quarter, per game, and their career stats, among many other advanced statistics. It's important for scouting agents to be able to be able to breakdown every part of a player's game and this database helps with that.

Entity-Relationship Diagram



Tables

Players contains the pid,name, birthdate, height and weight of the basketball players

```
CREATE TABLE players (  
  pid character(4) NOT NULL,  
  firstname text,  
  lastname text,  
  dateofbirth date,  
  heightinches numeric(3,1),  
  weightlbs numeric(4,1),  
  CONSTRAINT players_pkey PRIMARY KEY (pid)  
);
```

functional dependencies

pid -> firstname, lastname, dateofbirth, heightinches, weightlbs

	pid character(4)	firstname text	lastname text	dateofbirth date	heightinches numeric(3,1)	weightlbs numeric(4,1)
1	p001	Tim	Duncan	1976-04-25	83.0	250.0
2	p002	Alan	Labouseur	1912-12-25	95.0	300.0
3	p003	Chris	Kaman	1982-04-28	84.0	265.0
4	p004	Stephen	Curry	1988-03-14	75.0	190.0
5	p005	Giannis	Antetokounmpo	1994-12-06	83.0	222.0
6	p006	Matt	Bonner	1980-04-05	82.0	235.0
7	p007	Boban	Marjanovic	1988-08-15	87.0	290.0
8	p008	Lebron	James	1984-12-30	80.0	250.0
9	p009		Nene	1982-09-13	83.0	250.0
10	p010	Kristaps	Porzingis	1995-08-02	87.0	240.0

TeamsPlayers lists the teams and their players as well as their position(s)

create table teamsPlayers (

tid char(4) not null references teams(tid),

pid char(4) not null references players(pid),

season integer not null,

position text not null,

primary key (tid,pid,season,position)

);

functional dependencies

(tid,pid,season,position)->

	tid character(4)	pid character(4)	season integer	playerposition text
1	t001	p001	1996	forward
2	t001	p001	2016	center
3	t001	p006	2014	small-forward
4	t001	p007	2016	center
5	t002	p010	2016	forward
6	t010	p002	1937	point guard
7	t007	p003	2016	center
8	t006	p004	2016	point guard
9	t006	p004	2015	point guard
10	t008	p005	2016	small-foward
11	t003	p008	2010	power-foward
12	t004	p008	2007	small-foward
13	t004	p008	2016	small-foward
14	t009	p009	2011	center
15	t005	p009	2016	center

Teams lists the team Id, team name, and the division a team is in

create table teams (

tid char(4) not null,

teamName text,

division text,

primary key (tid)

);

functional dependencies

tid -> teamName,division

	tid character(4)	teamname text	division text
1	t001	San Antonio Spurs	Southwest
2	t002	New York Knicks	Atlantic
3	t003	Cleveland Cavaliers	Central
4	t004	Miami Heat	Southeast
5	t005	Washington Wizards	Southeast
6	t006	Golden State Warriors	Pacific
7	t007	Portland Trail Blazers	Northwest
8	t008	Milwaukee Bucks	Central
9	t009	Denver Nuggets	Northwest
10	t010	Philadelphia 76ers	Atlantic

Games lists all games along with a few statistics

create table games (

gid char(4) not null,

location text,

winnerTID char(4),

loserTID char(4),

ptDiff integer,

gameDate date,

primary key (gid)

);

functional dependencies

gid -> location, winnerTid,loserTid,ptDiff,gameDate

	gid character(4)	location text	winnertid character(4)	losertid character(4)	ptdiff integer	gamedate date
1	g001	Miami	t001	t004	5	2015-11-24
2	g002	Miami	t004	t002	10	2015-10-20
3	g003	Denver	t009	t008	13	2016-01-24
4	g004	Washington	t005	t003	7	2014-12-20
5	g005	New York	t001	t002	5	2016-03-24
6	g006	New York	t002	t001	15	2016-02-15
7	g007	Oakland	t006	t007	25	2016-04-11
8	g008	Philadelphia	t006	t010	36	2015-11-15
9	g009	Portland	t009	t007	1	2016-01-10
10	g010	San Antonio	t001	t006	1	2016-05-01
11	g011	Cleveland	t005	t003	10	2016-04-20
12	g012	Milwaukee	t008	t010	4	2016-04-30
13	g013	Oakland	t001	t006	24	2016-06-02
14	g014	Philadelphia	t002	t010	75	2016-05-27
15	g015	Portland	t002	t007	9	2016-05-10
16	g016	New York	t002	t009	22	2016-06-12
17	g017	Miami	t004	t003	10	2016-05-19
18	g018	Cleveland	t006	t003	30	2016-06-15

RegularSeason lists all regular season games

```
create table regularSeason (  
  gid    char(4) not null references games(gid),  
  primary key(gid)  
);
```

functional dependencies

gid ->

	gid character(4)
1	g001
2	g002
3	g003
4	g004
5	g005
6	g006
7	g008
8	g009

playOffGames lists all playoff games

```
create table playoffGames (  
  gid    char(4) not null references games(gid),  
  seriesWinner  text,  
  primary key(gid)  
);
```

functional dependencies

gid -> seriesWinner

	gid character(4)	serieswinner text
1	g010	San Antonio Spurs
2	g011	Washington Wizards
3	g012	Milwaukee Bucks
4	g013	Golden State Warriors
5	g014	New York Knicks
6	g015	Portland Trail Blazers
7	g016	Denver Nuggets
8	g017	Miami Heat
9	g018	Golden State Warriors

quarterFinals lists all quarterfinal games

```
create table quarterFinals (  
gid      char(4) not null references playoffGames(gid),  
primary key(gid)  
);
```

functional dependencies

gid ->

	gid character(4)
1	g011
2	g012

semiFinals lists all semifinal games

```
create table semiFinals (  
gid      char(4) not null references playoffGames(gid),  
primary key(gid)  
);
```

functional dependencies

gid ->

	gid character(4)
1	g010
2	g015

conferenceFinals lists all conference final games

```
create table conferenceFinals (  
gid      char(4) not null references playoffGames(gid),  
primary key(gid)  
);
```

functional dependencies

gid ->

	gid character(4)
1	g014
2	g017

finals lists all finals games

create table finals (

gid char(4) not null references playoffGames(gid),

primary key(gid)

);

functional dependencies

gid ->

	gid character(4)
1	g013
2	g016
3	g018

playerStatsFirstQuarter lists all first quarter stats of all games for all players

create table playerStatsFirstQuarter (

pid char(4) not null references players(pid),

gid char(4) not null references games(gid),

PPQ1 integer,

MPQ1 decimal(3,1),

FGMQ1 integer,

FGAQ1 integer,

threePAQ1 integer,

threePMQ1 integer,

FTAQ1 integer,

FTMQ1 integer,

OREBQ1 integer,

DREBQ1 integer,

ASTQ1 integer,

STLQ1 integer,

BLKQ1 integer,

PFQ1 integer,

turnoversQ1 integer,

primary key (pid, gid)

);

functional dependencies

(pid, gid) ->

ppq1,mpq1,fgmq1,fgaq1,threepaq1,threepmq1,ftaq1,ftmq1,orebq1,drebq1,astq1,stlq1,blkq1,pfq1

***note that all rows are not shown here**

	pid character(4)	gid character(4)	ppq1 integer	mpq1 numeric(3,1)	fgmq1 integer	fgaq1 integer	threepaq1 integer	threepmq1 integer	ftaq1 integer	ftmq1 integer	orebq1 integer	drebq1 integer	astq1 integer	stlq1 integer	blkq1 integer	pfq1 integer	turnoversq1 integer
1	p001	g001	12	6.0	6	8	1	0	1	0	1	4	1	0	2	0	0
2	p001	g005	5	6.0	1	1	1	0	4	3	0	3	0	2	2	1	1
3	p001	g006	10	5.0	5	5	1	0	1	0	4	3	1	0	2	0	0
4	p001	g010	24	10.0	10	10	1	0	4	4	0	1	0	0	1	0	0
5	p001	g013	12	5.0	4	8	1	1	2	1	2	2	1	0	1	1	0
6	p002	g008	0	12.0	1	15	15	0	10	0	0	0	0	0	0	2	10
7	p002	g012	0	12.0	1	10	12	0	14	0	0	0	0	0	0	1	12
8	p002	g014	1	12.0	1	10	12	0	14	0	0	0	0	0	0	1	13
9	p003	g007	2	5.0	1	1	1	0	1	0	2	4	1	0	2	1	1
10	p003	g009	3	4.0	1	1	2	1	1	0	2	0	0	0	1	0	0
11	p003	g015	3	3.0	1	3	1	0	2	1	0	2	1	0	0	0	1
12	p004	g007	12	8.0	2	3	2	4	2	2	0	1	3	2	0	0	1
13	p004	g008	9	9.0	1	2	3	3	1	0	0	1	4	2	1	1	3
14	p004	g010	3	10.0	1	1	1	1	1	0	0	1	4	0	1	1	4
15	p004	g013	8	8.0	4	5	2	0	1	0	1	2	3	0	0	1	2
16	p004	g018	13	9.0	2	2	4	2	4	3	0	1	2	1	1	1	0
17	p005	g003	5	9.0	2	4	1	0	2	1	3	0	1	0	1	1	0
18	p005	g012	4	4.0	1	1	2	1	2	1	0	1	0	0	0	2	0
19	p006	g001	3	2.0	0	1	1	1	1	0	1	2	1	0	2	0	0
20	p006	g005	1	2.0	0	2	2	0	2	1	0	1	0	0	0	0	0
21	p006	g006	5	3.0	1	2	1	1	1	0	0	3	0	0	1	1	0
22	p006	g010	2	4.0	1	3	1	0	2	4	0	1	0	0	1	0	0

playerStatsSecondQuarter lists all second quarter stats of all games for all players

```
create table playerStatsSecondQuarter (
pid          char(4) not null references players(pid),
gid          char(4) not null references games(gid),
PPQ2        integer,
MPQ2        decimal(3,1),
FGMQ2       integer,
FGAQ2       integer,
threePAQ2   integer,
threePMQ2   integer,
FTAQ2       integer,
FTMQ2       integer,
OREBQ2      integer,
DREBQ2      integer,
ASTQ2       integer,
STLQ2       integer,
BLKQ2       integer,
PFQ2        integer,
turnoversQ2 integer,
primary key (pid, gid)
);
```

functional dependencies

(pid, gid) ->
ppq2,mpq2,fgmq2,fgaq2,threepaq2,threepmq2,ftaq2,ftmq2,orebq2,drebq2,astq2,stlq2,blkq2,pfq2

***note all rows are not shown here**

	pid character(4)	gid character(4)	ppq2 integer	mpq2 numeric(3,1)	fgmq2 integer	fgaq2 integer	threepaq2 integer	threepmq2 integer	ftaq2 integer	ftmq2 integer	orebq2 integer	drebq2 integer	astq2 integer	stlq2 integer	blkq2 integer	pfq2 integer	turnoversq2 integer
1	p001	g001	10	6.0	5	7	1	0	2	0	2	4	1	0	2	0	0
2	p001	g005	8	5.0	1	1	1	1	4	3	0	3	0	2	1	1	1
3	p001	g006	12	5.0	6	6	0	0	1	0	4	3	1	0	2	0	1
4	p001	g010	4	4.0	1	1	1	0	2	2	0	2	0	0	1	0	0
5	p001	g013	3	5.0	0		1	1		0	1	2	1	0	1	1	0
6	p002	g008	0	12.0	0	20	20	0	10	0	0	0	0	0	0	2	15
7	p002	g012	0	12.0	0	15	16	0	14	0	0	0	0	0	0	1	13
8	p002	g014	1	12.0	0	20	15	0	14	1	0	0	0	0	0	1	16
9	p003	g007	3	5.0	1	1	1	0	2	1	1	3	1	0	2	1	1
10	p003	g009	5	5.0	2	3	1	0	2	1	0	2	0	0	0	0	0
11	p003	g015	6	4.0	1	3	1	1	2	1	0	2	1	0	0	1	0
12	p004	g007	10	5.0	1	3	2	4	2	2	0	1	3	2	0	0	1
13	p004	g008	7	9.0	0	2	2	2	2	1	0	1	4	2	1	1	1
14	p004	g010	6	10.0	0	1	3	2		0	0	1	4	0	2	0	1
15	p004	g013	3	5.0	3	3	3	0	2	1	1	2	3	0	0	1	1
16	p004	g018	5	9.0	1	2	2	1	2	1	0	1	2	1	1	1	0
17	p005	g003	5	9.0	2	4	1	0	2	1	3	0	2	0	1	1	1
18	p005	g012	5	3.0	1	2	1	1	2	0	0	1	0	0	0	2	0
19	p006	g001	2	2.0	0	1	1	0	2	2	1	2	1	0	1	0	0
20	p006	g005	5	2.0	0	1	1	0	2	2	0	0	0	2	0	1	1
21	p006	g006	5	3.0	2	2	1	0	2	1	1	2	0	0	1	1	0
22	p006	g010	2	5.0	1	3	1	0	2	4	0	1	0	0	2	0	0

playerStatsThirdQuarter lists all third quarter stats of all games for all players

create table playerStatsThirdQuarter (

pid char(4) not null references players(pid),

gid char(4) not null references games(gid),

PPQ3 integer,

MPQ3 decimal(3,1),

FGMQ3 integer,

FGAQ3 integer,

threePAQ3 integer,

threePMQ3 integer,

FTAQ3 integer,

FTMQ3 integer,

OREBQ3 integer,

DREBQ3 integer,

ASTQ3 integer,

STLQ3 integer,

BLKQ3 integer,

PFQ3 integer,

turnoversQ3 integer,

primary key (pid, gid)

);

functional dependencies

(pid, gid) ->

ppq3,mpq3,fgmq3,fgaq3,threepaq3,threepmq3,ftaq3,ftmq3,orebq3,drebq3,astq3,stlq3,blkq3,pfq3

***note all rows are not shown here**

	pid character(4)	gid character(4)	ppq3 integer	mpq3 numeric(3,1)	fgmq3 integer	fgaq3 integer	threepaq3 integer	threepmq3 integer	ftaq3 integer	ftmq3 integer	orebq3 integer	drebq3 integer	astq3 integer	stlq3 integer	blkq3 integer	pfq3 integer	turnoversq3 integer
1	p001	g001	8	5.0	2	3	2	1	2	1	0	0	0	1	1	0	0
2	p001	g005	11	6.0	5	5	1	0	2	1	1	3	1	1	1	1	0
3	p001	g006	7	5.0	1	1	2	1	2	2	0	0	1	0	0	0	0
4	p001	g010	12	6.0	5	9	1	0	2	2	1	2	1	1	1	0	0
5	p001	g013	6	5.0	2	3	1	0	2	2	0	0	0	1	1	0	1
6	p002	g008	0	12.0	0	15	15	0	15	0	0	0	0	1	1	1	12
7	p002	g012	0	12.0	0	31	20	0	23	0	0	2	2	1	2	1	12
8	p002	g014	0	11.0	0	61	30	0	10	0	0	0	0	1	1	0	13
9	p003	g007	10	4.0	2	5	2	1	4	3	0	0	0	1	1	1	0
10	p003	g009	4	5.0	1	4	1	0	2	2	2	3	0	1	1	2	0
11	p003	g015	3	6.0	0	2	2	1	2	0	0	3	1	1	1	1	1
12	p004	g007	10	3.0	2	3	1	1	4	3	0	0	1	2	1	1	0
13	p004	g008	15	5.0	2	3	4	3	4	4	0	0	0	0	1	2	0
14	p004	g010	3	5.0	1	1	1	0	1	1	0	2	0	5	1	3	0
15	p004	g013	9	7.0	2	3	2	1	2	2	0	0	0	0	1	1	0
16	p004	g018	8	6.0	4	8	1	0	2	2	0	3	0	1	0	2	1
17	p005	g003	11	9.0	2	2	2	2	4	4	1	0	1	2	1	1	0
18	p005	g012	6	9.0	2	2	1	0	2	2	0	2	0	1	3	3	0
19	p006	g001	6	10.0	1	3	1	1	2	2	0	2	0	1	2	1	1
20	p006	g005	5	8.0	2	2	1	0	2	1	0	2	0	3	1	2	0
21	p006	g006	13	7.0	2	6	2	1	8	6	0	2	0	1	2	1	1
22	p006	g010	7	2.0	2	2	1	0	4	3	1	0	0	2	1	2	0

playerStatsFourthQuarter lists all fourth quarter stats of all games for all players

create table playerStatsFourthQuarter (

pid char(4) not null references players(pid),

gid char(4) not null references games(gid),

PPQ4 integer,

MPQ4 decimal(3,1),

FGMQ4 integer,

FGAQ4 integer,

threePAQ4 integer,

threePMQ4 integer,

FTAQ4 integer,

FTMQ4 integer,

OREBQ4 integer,

DREBQ4 integer,

ASTQ4 integer,

STLQ4 integer,

BLKQ4 integer,

PFQ4 integer,

turnoversQ4 integer,

primary key (pid, gid)

);

functional dependencies

(pid, gid) ->

ppq4,mpq4,fgmq4,fgaq4,threepaq4,threepmq4,ftaq4,ftmq4,orebq4,drebq4,astq4,stlq4,blkq4,p

fq4

***note all rows are not shown here**

	pid character(4)	gid character(4)	ppq4 integer	mpq4 numeric(3,1)	fgmq4 integer	fgaq4 integer	threepaq4 integer	threepmq4 integer	ftaq4 integer	ftmq4 integer	orebq4 integer	drebq4 integer	astq4 integer	stlq4 integer	blkq4 integer	pfq4 integer	turnoversq4 integer
1	p001	g001	10	7.0	4	6	1	1	2	2	2	0	3	1	1	0	0
2	p001	g005	9	10.0	2	2	1	1	2	2	2	0	2	3	1	0	1
3	p001	g006	4	2.0	0	1	1	1	1	1	2	0	0	2	1	0	2
4	p001	g010	9	10.0	2	2	1	1	2	2	2	0	0	1	1	0	0
5	p001	g013	9	10.0	2	2	1	1	2	2	2	0	0	2	1	0	1
6	p002	g008	0	12.0	0	23	12	0	14	0	2	0	0	0	1	0	12
7	p002	g012	0	12.0	0	23	23	0	23	0	0	0	3	1	0	0	23
8	p002	g014	0	12.0	0	54	23	0	44	0	2	0	0	0	1	0	14
9	p003	g007	4	10.0	1	2	1	0	2	2	2	0	2	3	1	0	1
10	p003	g009	12	10.0	2	2	3	2	2	2	2	1	1	4	1	0	1
11	p003	g015	13	9.0	5	2	1	0	4	3	2	3	1	1	1	0	0
12	p004	g007	9	7.0	2	2	3	1	2	4	2	0	0	0	1	0	1
13	p004	g008	12	8.0	2	2	4	2	2	2	2	3	0	4	1	0	1
14	p004	g010	9	10.0	2	2	2	1	2	2	2	3	0	1	1	0	1
15	p004	g013	12	9.0	2	2	1	1	4	4	1	2	0	0	1	0	2
16	p004	g018	15	10.0	2	2	4	3	2	2	2	0	0	2	0	0	1
17	p005	g003	7	6.0	1	2	1	1	2	2	2	0	0	1	1	0	1
18	p005	g012	3	7.0	0	2	1	1	2	0	1	3	0	3	1	0	2
19	p006	g001	6	12.0	2	2	1	0	2	2	2	0	0	2	1	0	1
20	p006	g005	9	6.0	2	2	1	0	6	5	0	1	0	0	1	0	0
21	p006	g006	9	5.0	1	1	3	2	4	2	2	0	0	1	1	0	1
22	p006	g010	9	10.0	2	2	1	1	2	2	1	4	0	2	1	0	1

Views

careerStats lists the career stats of all players

create view careerStats as

```
select p.firstname as "First Name", p.lastname as "Last Name",
       round(avg(q1.ppq1+q2.ppq2+q3.ppq3+q4.ppq4),1) as "Points",
       round(avg(q1.mpq1+q2.mpq2+q3.mpq3+q4.mpq4),1) as "Minutes Played",
       round(avg(q1.fgmq1+q2.fgmq2+q3.fgmq3+q4.fgmq4),1) as "FG Made",
       round(avg(q1.fgaq1+q2.fgaq2+q3.fgaq3+q4.fgaq4),1) as "FG Attempted",
       round(avg(q1.threepmq1+q2.threepmq2+q3.threepmq3+q4.threepmq4),1) as "3P
       Made",
       round(avg(q1.threepaq1+q2.threepaq2+q3.threepaq3+q4.threepaq4),1) as "3P
       Attempted",
       round(avg(q1.ftmq1+q2.ftmq2+q3.ftmq3+q4.ftmq4),1) as "FT Made",
       round(avg(q1.ftaq1+q2.ftaq2+q3.ftaq3+q4.ftaq4),1) as "FT Attempted",
       round(avg(q1.orebq1+q2.orebq2+q3.orebq3+q4.orebq4),1) as "Offensive Rebounds",
       round(avg(q1.drebq1+q2.drebq2+q3.drebq3+q4.drebq4),1) as "Defensive Rebounds",
       round(avg(q1.astq1+q2.astq2+q3.astq3+q4.astq4),1) as "Assists",
       round(avg(q1.stlq1+q2.stlq2+q3.stlq3+q4.stlq4),1) as "Steals",
       round(avg(q1.blkq1+q2.blkq2+q3.blkq3+q4.blkq4),1) as "Blocks",
       round(avg(q1.pfq1+q2.pfq2+q3.pfq3+q4.pfq4),1) as "Personal Fouls",
       round(avg(q1.turnoversq1+q2.turnoversq2+q3.turnoversq3+q4.turnoversq4),1) as
       "Turnovers"
from playerstatsfirstquarter q1 inner join players p on q1.pid=p.pid
      inner join playerstatssecondquarter q2 on q1.pid=q2.pid
      inner join playerstatsthirdquarter q3 on q1.pid=q3.pid
      inner join playerstatsfourthquarter q4 on q1.pid=q4.pid
group by(p.firstname, p.lastname)
order by p.lastname;
```

* table is too wide to fit on page, so it is split into two pictures

	First Name text	Last Name text	Points numeric	Minutes Played numeric	FG Made numeric	FG Attempted numeric	3P Made numeric	3P Attempted numeric
1	Giannis	Antetokounmpo	23.0	28.0	5.5	9.5	3.0	5.0
2	Matt	Bonner	21.2	19.8	4.6	8.8	1.6	4.8
3	Stephen	Curry	35.6	30.4	7.2	10.4	6.4	9.4
4	Tim	Duncan	37.0	24.6	12.8	17.0	2.0	4.2
5	Lebron	James	30.5	36.8	7.8	15.5	2.3	7.0
6	Chris	Kaman	22.7	23.3	6.0	9.7	2.0	5.7
7	Alan	Labouseur	0.7	47.7	1.0	99.0	0.0	71.0
8	Boban	Marjanovic	28.0	21.0	8.8	12.0	1.6	4.8
9		Nene	31.5	28.5	10.5	18.0	2.0	4.5
10	Kristaps	Porzingis	37.0	31.3	8.0	13.3	4.0	5.3

FT Made numeric	FT Attempted numeric	Offensive Rebounds numeric	Defensive Rebounds numeric	Assists numeric	Steals numeric	Blocks numeric	Personal Fouls numeric	Turnovers numeric
5.5	9.0	5.0	3.5	2.0	3.5	4.0	5.0	2.0
8.8	10.8	2.2	6.0	0.8	3.6	4.4	2.0	2.0
7.2	8.8	2.2	5.0	6.6	5.0	3.0	3.2	4.2
6.0	8.5	5.2	6.4	2.8	3.4	4.8	1.0	1.6
8.0	10.3	0.5	5.3	5.0	6.3	4.3	2.0	4.5
5.3	8.7	4.3	7.7	3.0	3.7	3.7	2.3	2.0
0.3	68.3	1.3	0.7	1.7	1.3	2.0	3.3	55.0
7.6	8.8	2.0	6.6	0.6	4.4	2.2	1.6	2.2
6.0	8.0	4.5	7.0	0.0	3.5	3.5	2.0	1.0
10.3	10.3	5.0	6.3	2.0	2.3	4.3	2.3	1.3

playersPosition lists all positions held by every player

create view playersPosition as

```
select p.firstname as "First Name",p.lastname as "Last Name", tp.playerposition as
"Position",tp.season, t.teamName as "Team Name"
```

```
from teamsPlayers tp inner join teams t on tp.tid=t.tid
```

```
inner join players p on tp.pid=p.pid
```

```
order by p.lastname, tp.season;
```

	First Name text	Last Name text	Position text	season integer	Team Name text
1	Giannis	Antetokounmpo	small-foward	2016	Milwaukee Bucks
2	Matt	Bonner	small-forward	2014	San Antonio Spurs
3	Stephen	Curry	point guard	2015	Golden State Warriors
4	Stephen	Curry	point guard	2016	Golden State Warriors
5	Tim	Duncan	forward	1996	San Antonio Spurs
6	Tim	Duncan	center	2016	San Antonio Spurs
7	Lebron	James	small-foward	2007	Miami Heat
8	Lebron	James	power-foward	2010	Cleveland Cavaliers
9	Lebron	James	small-foward	2016	Miami Heat
10	Chris	Kaman	center	2016	Portland Trail Blazers
11	Alan	Labouseur	point guard	1937	Philadelphia 76ers
12	Boban	Marjanovic	center	2016	San Antonio Spurs
13		Nene	center	2011	Denver Nuggets
14		Nene	center	2016	Washington Wizards
15	Kristaps	Porzingis	forward	2016	New York Knicks

Reports

1. Displays the rebounds and blocks for all centers, forwards, and small forwards

```
select p.firstname as "First Name", p.lastname as "Last Name",  
       round(avg(q1.drebq1+q1.orebq1+q2.drebq2+q2.orebq2+q3.drebq3+q3.orebq3+q4.drebq4+q4.orebq4),1) as "Rebounds Per Game",  
       round(avg(q1.blkq1+q2.blkq2+q3.blkq3+q4.blkq4),1) as "Blocks Per Game"  
from players p inner join teamsPlayers tp on p.pid=tp.pid  
               inner join playerstatsfirstquarter q1 on p.pid=q1.pid  
               inner join playerstatssecondquarter q2 on p.pid=q2.pid  
               inner join playerstatsthirdquarter q3 on p.pid=q3.pid  
               inner join playerstatsfourthquarter q4 on p.pid=q4.pid  
where tp.playerposition='center'  
or tp.playerposition='small-foward'  
or tp.playerposition='foward'  
group by(q1.pid,p.firstname,p.lastname)  
order by "Rebounds Per Game" desc;
```

	First Name text	Last Name text	Rebounds Per Game numeric	Blocks Per Game numeric
1	Chris	Kaman	12.0	3.7
2	Tim	Duncan	11.6	4.8
3		Nene	11.5	3.5
4	Boban	Marjanovic	8.6	2.2
5	Giannis	Antetokounmpo	8.5	4.0
6	Lebron	James	5.8	4.3

2. Displays the assists and steals for all point guards

```
select p.firstname as "First Name", p.lastname as "Last Name",  
       round(avg(q1.astq1+q2.astq2+q3.astq3+q4.astq4),1) as "Assists Per Game",  
       round(avg(q1.stlq1+q2.stlq2+q3.stlq3+q4.stlq4),1) as "Steals Per Game"  
from players p inner join teamsPlayers tp on p.pid=tp.pid  
               inner join playerstatsfirstquarter q1 on p.pid=q1.pid  
               inner join playerstatssecondquarter q2 on p.pid=q2.pid  
               inner join playerstatsthirdquarter q3 on p.pid=q3.pid  
               inner join playerstatsfourthquarter q4 on p.pid=q4.pid  
where tp.playerposition='point guard'  
group by(q1.pid,p.firstname,p.lastname);
```

	First Name text	Last Name text	Assists Per Game numeric	Steals Per Game numeric
1	Alan	Labouseur	1.7	1.3
2	Stephen	Curry	6.6	5.0

3. Displays the points per game for every player

```

select  p.firstname as "First Name", p.lastname as "Last Name",
        sum(q1.ppq1+q2.ppq2+q3.ppq3+q4.ppq4) as "Points", g.gamedate as "Game Date",
t.teamname as "Winning Team", g.location
from games g inner join playerstatsfirstquarter q1 on g.gid=q1.gid
              inner join playerstatssecondquarter q2 on g.gid=q2.gid
              inner join playerstatsthirdquarter q3 on g.gid=q3.gid
              inner join playerstatsfourthquarter q4 on g.gid=q4.gid
              inner join teams t on g.winnertid=t.tid, players p
where q1.pid=q2.pid
and q1.pid=q3.pid
and q1.pid=q4.pid
and q1.pid=p.pid
group by(q1.gid, p.firstname, p.lastname, g.gamedate, t.teamname, g.location)
order by p.lastname, g.gamedate;

```

	First Name text	Last Name text	Points bigint	Game Date date	Winning Team text	location text
1	Giannis	Antetokounmpo	28	2016-01-24	Denver Nuggets	Denver
2	Giannis	Antetokounmpo	18	2016-04-30	Milwaukee Bucks	Milwaukee
3	Matt	Bonner	17	2015-11-24	San Antonio Spurs	Miami
4	Matt	Bonner	32	2016-02-15	New York Knicks	New York
5	Matt	Bonner	20	2016-03-24	San Antonio Spurs	New York
6	Matt	Bonner	20	2016-05-01	San Antonio Spurs	San Antonio
7	Matt	Bonner	17	2016-06-02	San Antonio Spurs	Oakland
8	Stephen	Curry	43	2015-11-15	Golden State Warriors	Philadelphia
9	Stephen	Curry	41	2016-04-11	Golden State Warriors	Oakland
10	Stephen	Curry	21	2016-05-01	San Antonio Spurs	San Antonio
11	Stephen	Curry	32	2016-06-02	San Antonio Spurs	Oakland
12	Stephen	Curry	41	2016-06-15	Golden State Warriors	Cleveland
13	Tim	Duncan	40	2015-11-24	San Antonio Spurs	Miami
14	Tim	Duncan	33	2016-02-15	New York Knicks	New York
15	Tim	Duncan	33	2016-03-24	San Antonio Spurs	New York
16	Tim	Duncan	49	2016-05-01	San Antonio Spurs	San Antonio
17	Tim	Duncan	30	2016-06-02	San Antonio Spurs	Oakland
18	Lebron	James	32	2014-12-20	Washington Wizards	Washington
19	Lebron	James	41	2016-04-20	Washington Wizards	Cleveland
20	Lebron	James	27	2016-05-19	Miami Heat	Miami
21	Lebron	James	22	2016-06-15	Golden State Warriors	Cleveland
22	Chris	Kaman	24	2016-01-10	Denver Nuggets	Portland

23	Chris	Kaman	19	2016-04-11	Golden State Warriors	Oakland
24	Chris	Kaman	25	2016-05-10	New York Knicks	Portland
25	Alan	Labouseur	0	2015-11-15	Golden State Warriors	Philadelphia
26	Alan	Labouseur	0	2016-04-30	Milwaukee Bucks	Milwaukee
27	Alan	Labouseur	2	2016-05-27	New York Knicks	Philadelphia
28	Boban	Marjanovic	32	2015-11-24	San Antonio Spurs	Miami
29	Boban	Marjanovic	16	2016-02-15	New York Knicks	New York
30	Boban	Marjanovic	25	2016-03-24	San Antonio Spurs	New York
31	Boban	Marjanovic	40	2016-05-01	San Antonio Spurs	San Antonio
32	Boban	Marjanovic	27	2016-06-02	San Antonio Spurs	Oakland
33		Nene	32	2014-12-20	Washington Wizards	Washington
34		Nene	31	2016-04-20	Washington Wizards	Cleveland
35	Kristaps	Porzingis	36	2015-10-20	Miami Heat	Miami
36	Kristaps	Porzingis	40	2016-02-15	New York Knicks	New York
37	Kristaps	Porzingis	35	2016-03-24	San Antonio Spurs	New York

Stored Procedures

NumberOfPlayoffGames displays the number of playoff games the inputted player has played in

create or replace function NumberOfPlayoffGames(firstname text, lastname text, refcursor)

returns refcursor as

\$\$

declare

playerfirstname text := \$1;

playerlastname text := \$2;

resultset refcursor := \$3;

begin

open resultset for

select count(gid)

from playoffGames

where gid in (select gid

from playerstatsfirstquarter

where pid in (select pid

from players

where players.firstname=playerfirstname

and players.lastname=playerlastname

));

return resultset;

end;

\$\$

language plpgsql;

select NumberOfPlayOffGames('Tim','Duncan','results'); fetch all from results

	Playoff Games bigint
1	2

PlayersInPosition displays every player that plays or has played the inputted position

create or replace function PlayersInPosition(text, refcursor) returns refcursor as

\$\$

declare

positionOfPlayer text := \$1;

resultset refcursor := \$2;

begin

open resultset for

select p.firstname, p.lastname, tp.season

from teamsplayers tp inner join players p on tp.pid=p.pid

where tp.playerposition=positionOfPlayer

group by (p.firstname, p.lastname, tp.season);

```

return resultset;
end;
$$
language plpgsql;
select PlayersInPosition('center','results');
fetch all from results

```

	firstname text	lastname text	season integer
1	Tim	Duncan	2016
2	Chris	Kaman	2016
3	Boban	Marjanovic	2016
4		Nene	2011
5		Nene	2016

Points displays all players who have a higher points per game average than the inputted one

create or replace function Points(int, refcursor) returns refcursor as

```

$$
declare
pointMin int := $1;
resultset refcursor := $2;
begin
open resultset for
select p.firstname, p.lastname, round(avg(q1.ppq1+q2.ppq2+q3.ppq3+q4.ppq4),1) as
“Points
from playerstatsfirstquarter q1 inner join playerstatssecondquarter q2 on q1.gid=q2.gid
inner join playerstatsthirdquarter q3 on q1.gid=q3.gid
inner join playerstatsfourthquarter q4 on q1.gid=q4.gid,
players p
where q1.pid=q2.pid
and q1.pid=q3.pid
and q1.pid=q4.pid
and q1.pid=p.pid
group by (p.firstname, p.lastname)
having round(avg(q1.ppq1+q2.ppq2+q3.ppq3+q4.ppq4),1) > pointMin;
return resultset;
end;
$$
language plpgsql;
select Points(25,'results');
fetch all from results

```

	firstname text	lastname text	Points numeric
1	Boban	Marjanovic	28.0
2	Kristaps	Porzingis	37.0
3	Lebron	James	30.5
4	Stephen	Curry	35.6
5	Tim	Duncan	37.0
6		Nene	31.5

setNull_fg1 sets the field goals attempted in quarter to null if user tries to enter 0. This procedure could also be used for three pointers attempted and free throws attempted in all quarters

create or replace function setNull_fg1()

returns trigger

as \$\$

begin

if (new.fga1 = 0) then

update playerstatsfirstquarter

set fga1=null;

end if;

end;

\$\$ language plpgsql;

Triggers

shotsAttempted calls upon the **setNull_fgq1()** stored procedure when user inserts a value to **fgq1** in the **playerstatsfirstquarter** table

```
create trigger ShotsAttempted
before insert on playerstatsfirstquarter
for each row
execute procedure setNull_fgq1();
```

Before Update:

35	p010	g002	13	8.0	4	5
36	p010	g005	6	7.0	0	2
37	p010	g006	6	8.0	2	2

After Update:

35	p010	g002	10	8.0	4	4
36	p010	g005	10	5.0	0	2
37	p010	g006	12	6.0	2	2
38	p011	g001	12	6.0	6	

Security

Admin will be able to perform insert, update, alter, and delete functions on the database

- Create role admin
- Grant insert, select, update, alter, delete
- On all tables
- In schema public
- To admin;

User can perform queries on the database but cannot change the database

- Create role user
- Grant select
- On all tables
- In schema public
- To user;

Implementation Notes – Known Problems

I went through a couple of designs before I got to the final implementation. I originally started included statistics per game and career statistics tables but it made much more sense to come up with those statistics using queries. Inserting values into the fga, threepa, fta columns was difficult because inputting a 0 caused a dividing-by-zero issue and putting in null made it seem like the data was unavailable. I ended up removing all nulls and all 0, which made the statistics not as accurate but it allowed me to calculate field goal percentage.

Future Enhancements

Including a table that has data on a player's past and current salary among other things would make this database a lot more useful for agents scouting for players. Including more tables that hold even more in depth statistics like statistics per possession would certainly enhance this database.