

Mini Fantasy Football

Database Backend

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Table of Contents

Executive Summary	3
Entity Relationship Diagram	4
Table Create Statements	5,6,7,8
Sample Data	9,10,11,12,13,14,15,16,17
Trigger	18
View	19
Store Procedure	20
Final Notes	21

Executive Summary

The goal of this database is to maintain and keep track of all active players variety of statistics which will allow the user to know points each player received. Data will be going through specific tables where it can be accurately stored to help determine a winner to each of the matches. By keeping the stats on the same table, players stats will change each week and can be easily updated through the database. This also helps in case the database needs to be extended for new active players that join a team.

All SQL used in this project is written for and tested on Postgres.

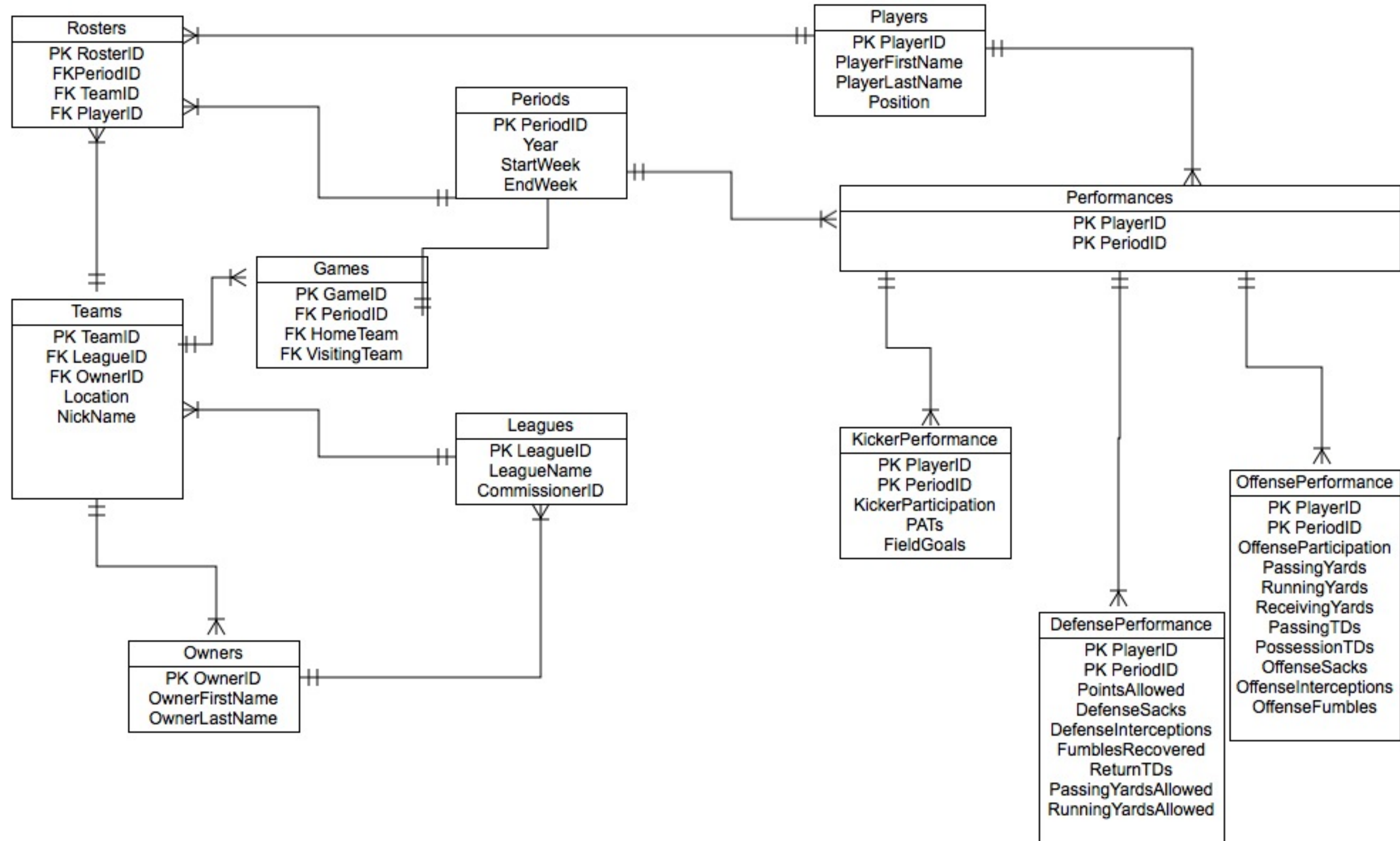


TABLE CREATE STATEMENTS

```
CREATE TABLE Players (  
  Player_ID SMALLINT PRIMARY KEY UNSIGNED NOT NULL AUTO_INCREMENT ,  
  PlayerFirstName CHAR(20) NOT NULL ,  
  PlayerLastName CHAR(20) NOT NULL ,  
  Position CHAR(12) NOT NULL COMMENT 'QB RB WR TE PK Def' ,  
  ;
```

```
CREATE TABLE Periods (  
  Period_ID SMALLINT PRIMARY KEY UNSIGNED NOT NULL ,  
  Year SMALLINT NOT NULL ,  
  StartWeek SMALLINT NOT NULL ,  
  EndWeek SMALLINT NOT NULL ,  
  ;
```

```
CREATE TABLE Performances (  
  Player_ID SMALLINT PRIMARY KEY UNSIGNED NOT NULL ,  
  Period_ID SMALLINT PRIMARY KEY UNSIGNED NOT NULL ,  
  INDEX `Player_ID` (`Player_ID` ASC) ,  
  INDEX `Period_ID` (`Period_ID` ASC) ,  
  CONSTRAINT `Player_ID`  
  FOREIGN KEY (`Player_ID` )  
  REFERENCES `myNewDatabase`.`Players` (`Player_ID` )  
  ON DELETE RESTRICT  
  ON UPDATE NO ACTION,  
  CONSTRAINT `Period_ID`  
  FOREIGN KEY (`Period_ID` )  
  REFERENCES `myNewDatabase`.`Periods` (`Period_ID` )  
  ON DELETE RESTRICT  
  ON UPDATE NO ACTION)  
  ;
```

```
CREATE TABLE DefensePerformances (  
  Player_ID SMALLINT PRIMARY KEY UNSIGNED NOT NULL ,  
  Period_ID SMALLINT PRIMARY KEY UNSIGNED NOT NULL ,  
  PointsAllowed SMALLINT NOT NULL ,  
  DefenseSacks SMALLINT NOT NULL ,  
  DefenseInterceptions SMALLINT NOT NULL ,  
  FumblesRecovered SMALLINT NOT NULL ,  
  ReturnTDs SMALLINT NOT NULL ,  
  PassingYardsAllowed SMALLINT NOT NULL ,  
  RunningYardsAllowed SMALLINT NOT NULL ,  
  INDEX `Player_ID` (`Player_ID` ASC) ,
```

```
INDEX `Period_ID` (`Period_ID` ASC) ,
CONSTRAINT `Player_ID`
FOREIGN KEY (`Player_ID` )
REFERENCES `myNewDatabase`.`Performances` (`Player_ID` )
ON DELETE RESTRICT
ON UPDATE NO ACTION,
CONSTRAINT `Period_ID`
FOREIGN KEY (`Period_ID` )
REFERENCES `myNewDatabase`.`Performances` (`Period_ID` )
ON DELETE RESTRICT
ON UPDATE NO ACTION)
;
```

```
CREATE TABLE Owners (
Owner_ID SMALLINT PRIMARY KEY NOT NULL AUTO_INCREMENT ,
OwnerFirst_Name VARCHAR(20) NOT NULL ,
OwnerLast_Name VARCHAR(20) NOT NULL ,
;
```

```
CREATE TABLE Leagues (
League_ID SMALLINT PRIMARY KEY NOT NULL AUTO_INCREMENT ,
LeagueName VARCHAR(45) NOT NULL ,
Commissioner_ID SMALLINT NOT NULL ,
INDEX `owner_ID` (`Commissioner_ID` ASC) ,
CONSTRAINT `owner_ID`
FOREIGN KEY (`Commissioner_ID` )
REFERENCES `myNewDatabase`.`Owners` (`Owner_ID` )
ON DELETE RESTRICT
ON UPDATE NO ACTION)
;
```

```
CREATE TABLE Teams (
Team_ID SMALLINT PRIMARY KEY UNSIGNED NOT NULL AUTO_INCREMENT ,
League_ID SMALLINT NOT NULL ,
Owner_ID SMALLINT NOT NULL ,
Location VARCHAR(40) NOT NULL ,
NickName VARCHAR(40) NOT NULL ,
INDEX `League_ID` (`League_ID` ASC) ,
INDEX `Owner_ID` (`Owner_ID` ASC) ,
CONSTRAINT `League_ID`
FOREIGN KEY (`League_ID` )
REFERENCES `myNewDatabase`.`Leagues` (`League_ID` )
ON DELETE RESTRICT
ON UPDATE NO ACTION,
CONSTRAINT `Owner_ID`
FOREIGN KEY (`Owner_ID` )
REFERENCES `myNewDatabase`.`Owners` (`Owner_ID` )
ON DELETE RESTRICT
```

ON UPDATE NO ACTION)

;

```
CREATE TABLE Rosters (  
  Roster_ID SMALLINT PRIMARY KEY UNSIGNED NOT NULL AUTO_INCREMENT ,  
  Period_ID SMALLINT UNSIGNED NOT NULL ,  
  League_ID SMALLINT UNSIGNED NOT NULL ,  
  Team_ID SMALLINT UNSIGNED NOT NULL ,  
  Player_ID SMALLINT UNSIGNED NOT NULL ,  
  
  CONSTRAINT `Team_ID`  
  FOREIGN KEY (`Team_ID` )  
  REFERENCES `myNewDatabase`.`Teams` (`Team_ID` )  
  ON DELETE RESTRICT,  
  CONSTRAINT `Player_ID`  
  FOREIGN KEY (`Player_ID` )  
  REFERENCES `myNewDatabase`.`Players` (`Player_ID` ),  
  CONSTRAINT `Period_ID`  
  FOREIGN KEY (`Period_ID` )  
  REFERENCES `myNewDatabase`.`Periods` (`Period_ID` )  
  ON DELETE RESTRICT  
  ON UPDATE NO ACTION)  
;
```

```
CREATE TABLE Games` (  
  Matchup_ID SMALLINT PRIMARY KEY UNSIGNED NOT NULL AUTO_INCREMENT ,  
  Period_ID SMALLINT NOT NULL ,  
  VisitingTeam_ID SMALLINT UNSIGNED NULL ,  
  HomeTeam_ID SMALLINT UNSIGNED NOT NULL ,  
  CONSTRAINT `Period_ID`  
  FOREIGN KEY (`Period_ID` )  
  REFERENCES `myNewDatabase`.`Periods` (`Period_ID` )  
  ON DELETE RESTRICT  
  ON UPDATE NO ACTION,  
  CONSTRAINT `Team_ID`  
  FOREIGN KEY (`VisitingTeam_ID` )  
  REFERENCES `myNewDatabase`.`Teams` (`Team_ID` )  
  ON DELETE RESTRICT  
  ON UPDATE NO ACTION,  
  CONSTRAINT `Team_ID`  
  FOREIGN KEY (`HomeTeam_ID` )  
  REFERENCES `myNewDatabase`.`Teams` (`Team_ID` )  
  ON DELETE RESTRICT  
  ON UPDATE NO ACTION)  
;
```

```
CREATE TABLE OffensePerformances (  
  Player_ID SMALLINT PRIMARY KEY UNSIGNED NOT NULL ,
```

```

Period_ID SMALLINT PRIMARY KEY UNSIGNED NOT NULL ,
OffenseParticipation VARCHAR(1) NOT NULL ,
PassingYards SMALLINT NOT NULL ,
RunningYards SMALLINT NOT NULL ,
ReceivingYards SMALLINT NOT NULL ,
PassingTDs SMALLINT NOT NULL ,
PossessionTDs SMALLINT NOT NULL ,
OffenseSacks SMALLINT NOT NULL ,
OffenseInterceptions SMALLINT NOT NULL ,
OffenseFumbles SMALLINT NOT NULL ,
INDEX `Player_ID` (`Player_ID` ASC) ,
INDEX `Period_ID` (`Period_ID` ASC) ,
CONSTRAINT `Player_ID`
FOREIGN KEY (`Player_ID` )
REFERENCES `myNewDatabase`.`Performances` (`Player_ID` )
ON DELETE RESTRICT
ON UPDATE NO ACTION,
CONSTRAINT `Period_ID`
FOREIGN KEY (`Period_ID` )
REFERENCES `myNewDatabase`.`Performances` (`Period_ID` )
ON DELETE RESTRICT
ON UPDATE NO ACTION)
;

```

```

CREATE TABLE KickerPerformances (
Player_ID SMALLINT PRIMARY KEY UNSIGNED NOT NULL ,
`Period_ID` SMALLINT PRIMARY KEY UNSIGNED NOT NULL ,
KickerParticipation FLOAT NOT NULL ,
PATs SMALLINT NOT NULL ,
FieldGoals SMALLINT NULL ,
INDEX `Player_ID` (`Player_ID` ASC) ,
INDEX `Period_ID` (`Period_ID` ASC) ,
CONSTRAINT `Player_ID`
FOREIGN KEY (`Player_ID` )
REFERENCES `myNewDatabase`.`Performances` (`Player_ID` )
ON DELETE RESTRICT
ON UPDATE NO ACTION,
CONSTRAINT `Period_ID`
FOREIGN KEY (`Period_ID` )
REFERENCES `myNewDatabase`.`Performances` (`Period_ID` )
ON DELETE RESTRICT
ON UPDATE NO ACTION);

```


Players

<u>Player ID</u>	<u>PlayerFirstName</u>	<u>PlayerLastName</u>	<u>Position</u>
1	Peyton	Manning	QB
2	Tom	Brady	QB
3	Adrian	Peterson	RB
4	Reggie	Bush	RB
5	Calvin	Johnson	WR
6	Ted	Ginn	WR
7	Antonio	Gates	TE
8	Kansas City	Chiefs	Def
9	Denver	Broncos	Def
10	Cam	Newton	QB
11	Eddie	Lacey	RB
12	Miami	Dolphins	Def
13	Antonio	Gates	TE
14	Roddy	White	WR
15	Jordy	Nelson	WR
16	Jay	Cutler	QB
17	Eli	Manning	QB
18	Tevon	Austin	WR
19	Rob	Gronkowski	TE
20	Baltimore	Ravens	Def
21	David	Akers	PK
22	John	Adams	PK
23	Steve	Carr	PK
24	Marshaun	Lynch	RB

Periods

<u>Period ID</u>	<u>Year</u>	<u>StartWeek</u>	<u>EndWeek</u>
Season	2013	1	17
Playoffs	2013	18	20

Performances

Player_ID	Period_ID
1	Season
2	Season
3	Season
4	Season
5	Season
6	Season
7	Season
8	Season
9	Season
10	Season
11	Season
12	Season
13	Season
14	Season
15	Season
16	Season
17	Season
18	Season
19	Season
20	Season
21	Season
22	Season
23	Season
24	Season

Defense Performance

Player_ID	Period_ID	PointsAllowed	DefenseSacks	DefenseInterceptions	FumblesRecovered	ReturnTDs
8	Season	28	4	0	1	0
9	Season	24	6	0	0	0
12	Season	14	2	1	1	0
20	Season	35	0	1	1	1

PassingYardsAllowed	RunningYardsAllowed
324	87
222	95
255	111
160	74

Owners

Owner_ID	OwnerFirst_Name	OwnerLast_Name
1	Kyle	Bakker
2	John	Brennan
3	Josh	Royce
4	Kevin	Stark
5	Demetrius	Williams
6	Bob	Wern

Leagues

League_ID	LeagueName	Commissioner_ID	FirstName	LastName
1	MaristFF	1	Demetrius	Williams
2	NFL	2	Bob	Wern

Teams

Team_ID	League_ID	Owner_ID	Location	NickName
1	1	1	PoTown	Baks
2	1	2	PoTown	Section1
3	1	3	PoTown	Rome
4	1	4	PoTown	Monkeys
5	1	5	PoTown	Taxfree
6	1	6	PoTown	Rents
7	2	1	Kansas	Gorrillas
8	2	2	Kansas	Eagles
9	2	3	Kansas	Foxes
10	2	4	Kansas	Bulls
11	2	5	Kansas	Bears
12	2	6	Kansas	Titans

Rosters

Roster_ID	Period_ID	League_ID	Team_ID	Player_ID
1	Season	1	1	2
2	Season	1	2	12
3	Season	1	3	13
4	Season	1	4	6
5	Season	1	5	14
6	Season	1	6	3
7	Season	1	7	11
8	Season	1	8	5
9	Season	1	9	20
10	Season	1	10	19
11	Season	1	11	1
12	Season	1	12	21
13	Season	1	1	10
14	Season	1	2	17
15	Season	1	3	4
16	Season	1	4	18
17	Season	1	5	16
18	Season	1	6	22
19	Season	1	7	9
20	Season	1	8	23
21	Season	1	9	24
22	Season	1	10	7
23	Season	1	11	15
24	Season	1	12	8

Games

Matchup_ID	League_ID	Period_ID	VisitingTeam_ID	HomeTeam_ID
1	1	Season	Baks	Section1
2	1	Season	Rome	Taxfree
3	1	Season	Rent	Monkeys
4	2	Season	Foxes	Bears
5	2	Season	Titans	Eagles
6	2	Season	Bulls	Gorrillas

Offense Performance

Player_ID	Period_ID	OffenseParticipation	PassingYards	RunningYards	RecievingYards	PassingTDs	PossessionTDs
1	Season	Y	1151	89	0	35	1
2	Season	Y	987	25	0	32	2
3	Season	Y	10	1365	232	0	30
4	Season	Y	0	985	355	0	19
5	Season	Y	0	0	1200	0	15
6	Season	Y	0	121	900	0	18
7	Season	Y	0	0	888	0	22
8	Season	N	0	0	0	0	0
9	Season	N	0	0	0	0	0
10	Season	Y	762	452	0	28	13
11	Season	Y	0	200	741	0	28
12	Season	N	0	0	0	0	12
13	Season	Y	0	0	788	0	14
14	Season	Y	0	0	878	0	17
15	Season	Y	0	0	988	0	10
16	Season	Y	635	44	0	21	11
17	Season	Y	874	10	0	25	8
18	Season	Y	0	321	545	0	2
19	Season	Y	0	0	965	0	2
20	Season	N	0	0	0	0	20
21	Season	Y	0	0	0	0	0
22	Season	Y	0	0	0	0	0
23	Season	Y	0	0	0	0	0
24	Season	Y	0	1100	100	0	35

Offense Performance continued

[illegible]

Kicker Performance

Player_ID	Period_ID	KickerParticipation	PATs	FieldGoals
1	Season	N	0	0
2	Season	N	0	0
3	Season	N	0	0
4	Season	N	0	0
5	Season	N	0	0
6	Season	N	0	0
7	Season	N	0	0
8	Season	N	0	0
9	Season	N	0	0
10	Season	N	0	0
11	Season	N	0	0
12	Season	N	0	0
13	Season	N	0	0
14	Season	N	0	0
15	Season	N	0	0
16	Season	N	0	0
17	Season	N	0	0
18	Season	N	0	0
19	Season	N	0	0
20	Season	N	0	0
21	Season	Y	60	20
22	Season	Y	72	17
23	Season	Y	55	14
24	Season	N	0	0

Triggers

Triggers can be very useful in this database because injuries happen all the time. The trigger below should update the players table to add a new player to the list.

Create SQL

```
CREATE RULE start_player AS ON INSERT TO Players
INSERT INTO Players (Player_ID,PlayerFirstName,PlayerLastName, Position,)
VALUES (NEW.Player_ID, NEW.PlayerFirstName, NEW.PlayerLastName, NEW.Position);
```

```
CREATE RULE update_player AS ON INSERT TO Players
INSERT INTO Players (Player_ID,PlayerFirstName,PlayerLastName, Position,)
VALUES (NEW.Player_ID, NEW.PlayerFirstName, NEW.PlayerLastName, NEW.Position);
```

Views

Views in this database can be helpful if you wanted to make a trade or pick up a free agent player. This view below should show all players with the position QB along with their passing yards and TDs.

```
CREATE VIEW Quarterbacks AS  
SELECT column_name(s), Position, Player_ID, Owner_ID, PassingYards, PassingTDs  
FROM table_name Players, OffensePPerformance  
GROUP BY PassingTDs
```

Stored Procedure

This stored procedure will return the total running back yards for all players.

```
CREATE FUNCTION getRunningbackYards (INT)
DECLARE
    totalrunyards INTEGER := (select sum(RunningYards)
                                from OffensePerformance
                                where Player_ID = player);
BEGIN
    RETURN totalrunyards;
END;
$$ LANGUAGE plpgsql;
```

Final Notes

There are many situations I could have worked on if more time was available such as

- Separating offense and defense performances for each game and quarter
- Adding more notable statistics for fantasy football such as quarterback rating, ranking of the defense played, etc..
- Any security issues