

Reporting & Analytics

Identify reporting/analytics stories: Show SQL, query plan and output in a doc

3. As a Fan, I want to view standings (leaderboard) so that easily know each team's ranking

3 Sub-tasks

1. Need to create a totals view that records wins AND losses

e.g. Totals VIEW attributes -> seasonid, teamid, wins, losses, win%, conference, division, home, road

2. Need to create a standings view that summarizes each team based ON totals view

3. Need to rank teams in standings

Sub-task 1 - Create Totals View

EXPLAIN EXTENDED

(

```
SELECT DISTINCT t1.idgame,
               t1.season_idseason,
               t1.home_team_id,
               t1.away_team_id,
               CASE
                 WHEN t1.team_points > t2.team_points
                 THEN t1.idteam
                 WHEN t1.team_points < t2.team_points
                 THEN t2.idteam
                 END AS win_team_id,
               CASE
                 WHEN t1.team_points < t2.team_points
                 THEN t1.idteam
                 WHEN t1.team_points > t2.team_points
                 THEN t2.idteam
                 END AS loss_team_id
```

FROM (

```
SELECT idgame,
       team_name,
       idteam,
       home_team_id,
       away_team_id,
       season_idseason,
       SUM(pts) AS team_points
```

```

FROM game g
      JOIN box_score b
            ON g.idgame = b.game_idgame
      JOIN team t
            ON b.team_idteam = t.idteam

GROUP BY 1, 2
ORDER BY 1 ASC
) as t1
INNER JOIN
(
  SELECT idgame,
        team_name,
        idteam,
        home_team_id,
        away_team_id,
        season_idseason,
        SUM(pts) AS team_points
  FROM game g
        JOIN box_score b
              ON g.idgame = b.game_idgame
        JOIN team t
              ON b.team_idteam = t.idteam

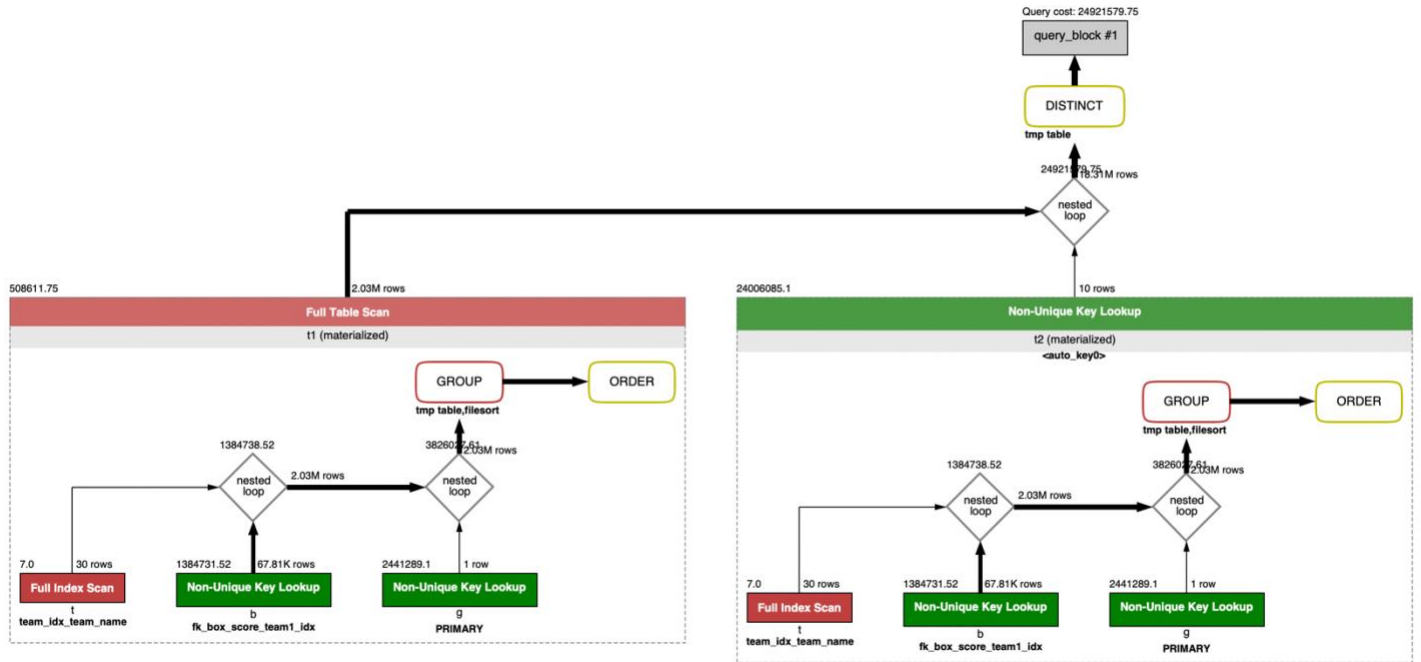
  GROUP BY 1, 2
  ORDER BY 1 ASC
) as t2
ON t1.idgame = t2.idgame
WHERE t1.team_name <> t2.team_name
HAVING win_team_id IS NOT NULL
      AND loss_team_id IS NOT NULL
);

```

query-plan1.png

	id	select_type	table	partitions	type	possible_keys	key	key_len	ref	filtered	rows	Extra
1	1	PRIMARY	<derived>	<null>	ALL	<null>	<null>	<null>	<null>	100	2034407	Using temporary
2	1	PRIMARY	<derived>	<null>	ref	<auto_key0>	<auto_key0>	4	t1.idgame	90	10	Using where
3	3	DERIVED	t	<null>	ALL	PRIMARY	<null>	<null>	<null>	100	30	Using temporary; Using filesort
4	3	DERIVED	b	<null>	ref	fk_box_score_game1_idx, fk_box_score_team1_idx	fk_box_score_team1_idx	4	njba.t.idteam	100	67813	<null>
5	3	DERIVED	g	<null>	ref	PRIMARY	PRIMARY	4	njba.b.game_idgame	100	1	<null>
6	2	DERIVED	t	<null>	ALL	PRIMARY	<null>	<null>	<null>	100	30	Using temporary; Using filesort
7	2	DERIVED	b	<null>	ref	fk_box_score_game1_idx, fk_box_score_team1_idx	fk_box_score_team1_idx	4	njba.t.idteam	100	67813	<null>
8	2	DERIVED	g	<null>	ref	PRIMARY	PRIMARY	4	njba.b.game_idgame	100	1	<null>

reporting1.png



Sub-task 2 - Create standings View

EXPLAIN EXTENDED

```
(
  SELECT season_idseason,
         loss_team_id,
         COUNT(loss_team_id) AS loss
  FROM totals
  WHERE (home_team_id = loss_team_id
        OR away_team_id = loss_team_id)
  GROUP BY 1, 2
  ORDER BY 1, 2
);
```

query-plan2.png

id	select_type	table	partitions	type	possible_keys	key	key_len	ref	rows	filtered	Extra
1	PRIMARY	<derived2>	<null>	ALL	<null>	<null>	<null>	<null>	18389725	19	Using where; Using temporary; Using filesort
2	DERIVED	<derived4>	<null>	ALL	<null>	<null>	<null>	<null>	2034407	100	Using temporary
3	DERIVED	<derived3>	<null>	ref	<auto_key0>	<auto_key0>	4	t1.idgame	10	90	Using where
4	DERIVED	t	<null>	ALL	PRIMARY	<null>	<null>	<null>	30	100	Using temporary; Using filesort
5	DERIVED	b	<null>	ref	fk_box_score_game1_idx, fk_box_score_team1_idx	fk_box_score_team1_idx	4	njba.t.idteam	67813	100	<null>
6	DERIVED	g	<null>	ref	PRIMARY	PRIMARY	4	njba.b.game_idgame	1	100	<null>
7	DERIVED	t	<null>	ALL	PRIMARY	<null>	<null>	<null>	30	100	Using temporary; Using filesort
8	DERIVED	b	<null>	ref	fk_box_score_game1_idx, fk_box_score_team1_idx	fk_box_score_team1_idx	4	njba.t.idteam	67813	100	<null>
9	DERIVED	g	<null>	ref	PRIMARY	PRIMARY	4	njba.b.game_idgame	1	100	<null>

EXPLAIN EXTENDED

```
(
  SELECT season_idseason,
         win_team_id,
         COUNT(win_team_id) AS win
```

```

FROM totals
WHERE (home_team_id = win_team_id
      OR away_team_id = win_team_id)
GROUP BY 1, 2
ORDER BY 1, 2
);

```

query-plan3.png

id	select_type	table	partitions	type	possible_keys	key	key_len	ref	rows	filtered	Extra
1	PRIMARY	<derived2>	<null>	ALL	<null>	<null>	<null>	<null>	18309725	19	Using where; Using temporary; Using filesort
2	DERIVED	<derived4>	<null>	ALL	<null>	<null>	<null>	<null>	2034407	100	Using temporary
3	DERIVED	<derived3>	<null>	ref	<auto_key@>	<auto_key@>	4	t1.idgame	10	90	Using where
4	DERIVED	t	<null>	ALL	PRIMARY	<null>	<null>	<null>	30	100	Using temporary; Using filesort
5	DERIVED	b	<null>	ref	fk_box_score_game1_idx, fk_box_score_team1_idx	fk_box_score_team1_idx	4	njba.t.idteam	67813	100	<null>
6	DERIVED	g	<null>	ref	PRIMARY	PRIMARY	4	njba.b.game_idgame	1	100	<null>
7	DERIVED	t	<null>	ALL	PRIMARY	<null>	<null>	<null>	30	100	Using temporary; Using filesort
8	DERIVED	b	<null>	ref	fk_box_score_game1_idx, fk_box_score_team1_idx	fk_box_score_team1_idx	4	njba.t.idteam	67813	100	<null>
9	DERIVED	g	<null>	ref	PRIMARY	PRIMARY	4	njba.b.game_idgame	1	100	<null>

EXPLAIN EXTENDED

```

(
SELECT season_idseason,
       idteam,
       SUM(game_win) AS wins,
       SUM(game_loss) AS losses,
       ROUND((SUM(game_win)/SUM(game_win + game_loss)) * 100, 1)
       AS win_pct,
       CONCAT(CAST(SUM(conf_win) AS CHAR(2)), '- ',
              CAST(SUM(cONf_loss) AS CHAR(2)) ) AS conf_record,
       CONCAT(CAST(SUM(div_win) AS CHAR(2)), '- ',
              CAST(SUM(div_loss) AS CHAR(2)) ) AS div_record,
       CONCAT(CAST(SUM(home_win) AS CHAR(2)), '- ',
              CAST(SUM(home_loss) AS CHAR(2)) ) AS home_record,
       CONCAT(CAST(SUM(away_win) AS CHAR(2)), '- ',
              CAST(SUM(away_loss) AS CHAR(2)) ) AS away_record
FROM (
SELECT season_idseason,
       idteam,
       conference,
       division,
       s.win_team_id,
       s.loss_team_id,
CASE WHEN s.win_team_id = t.idteam
      THEN 1
      ELSE 0

```

```

        END AS game_win,
CASE WHEN s.loss_team_id = t.idteam
    THEN 1
    ELSE 0
        END AS game_loss,
-- Conference Record
CASE WHEN (s.win_team_id = t.idteam) AND
    conference = (
        SELECT t.conference
        FROM team t
        WHERE s.loss_team_id = t.idteam
    )
    THEN 1
    ELSE 0
        END AS conf_win,
CASE WHEN (s.loss_team_id = t.idteam) AND
    conference = (
        SELECT t.conference
        FROM team t
        WHERE s.win_team_id = t.idteam
    )
    THEN 1
    ELSE 0 END AS conf_loss,
-- Division Record
CASE WHEN (s.win_team_id = t.idteam) AND
    division = (
        SELECT t.division
        FROM team t
        WHERE s.loss_team_id = t.idteam
    )
    THEN 1
    ELSE 0 END AS div_win,
CASE WHEN (s.loss_team_id = t.idteam) AND
    division = (
        SELECT t.division
        FROM team t
        WHERE s.win_team_id = t.idteam
    )
    THEN 1

```

```

ELSE 0 END AS div_loss,
-- Home Record
CASE WHEN (s.win_team_id = t.idteam) AND home_team_id = win_team_id
THEN 1
ELSE 0 END AS home_win,
CASE WHEN (s.loss_team_id = t.idteam) AND home_team_id = loss_team_id
THEN 1
ELSE 0 END AS home_loss,
-- Away Record
CASE WHEN (s.win_team_id = t.idteam) AND away_team_id = win_team_id
THEN 1
ELSE 0 END AS away_win,
CASE WHEN (s.loss_team_id = t.idteam) AND away_team_id = loss_team_id
THEN 1
ELSE 0 END AS away_loss
FROM totals s
JOIN team t
) AS standings
GROUP BY idteam
);

```

query-plan4.png

id	select_type	table	partitions	type	possible_keys	key	key_len	ref	rows	filtered	Extra
1	1 PRIMARY	<derived>	<null>	ALL	<null>	<null>	<null>	<null>	549291717	100	Using temporary; Using filesort
2	2 DERIVED	t	<null>	ALL	<null>	<null>	<null>	<null>	30	100	<null>
3	2 DERIVED	<derived7>	<null>	ALL	<null>	<null>	<null>	<null>	18309725	100	Using join buffer (Block Nested Loop)
4	7 DERIVED	<derived9>	<null>	ALL	<null>	<null>	<null>	<null>	2034407	100	Using temporary
5	7 DERIVED	<derived8>	<null>	ref	<auto_key0>	<auto_key0>	4	t1.idgame	10	90	Using where
6	8 DERIVED	t	<null>	ALL	PRIMARY	<null>	<null>	<null>	30	100	Using temporary; Using filesort
7	8 DERIVED	b	<null>	ref	fk_box_score_game1_idx, fk_box_score_team1_idx	fk_box_score_team1_idx	4	njba.t.idteam	67813	100	<null>
8	8 DERIVED	g	<null>	ref	PRIMARY	PRIMARY	4	njba.b.game_idgame	1	100	<null>
9	9 DERIVED	t	<null>	ALL	PRIMARY	<null>	<null>	<null>	30	100	Using temporary; Using filesort
10	9 DERIVED	b	<null>	ref	fk_box_score_game1_idx, fk_box_score_team1_idx	fk_box_score_team1_idx	4	njba.t.idteam	67813	100	<null>
11	9 DERIVED	g	<null>	ref	PRIMARY	PRIMARY	4	njba.b.game_idgame	1	100	<null>
12	6 DEPENDENT SUBQUERY	t	<null>	eq_ref	PRIMARY	PRIMARY	4	s.win_team_id	1	100	Using where
13	5 DEPENDENT SUBQUERY	t	<null>	eq_ref	PRIMARY	PRIMARY	4	s.loss_team_id	1	100	Using where
14	4 DEPENDENT SUBQUERY	t	<null>	eq_ref	PRIMARY	PRIMARY	4	s.win_team_id	1	100	Using where
15	3 DEPENDENT SUBQUERY	t	<null>	eq_ref	PRIMARY	PRIMARY	4	s.loss_team_id	1	100	Using where

Sub-task 3 - Rank the standings

EXPLAIN EXTENDED

```

(
SELECT s.season_idseason,
t.team_name,
s.win_pct,
@curRank := @curRank + 1 AS ranks
FROM standings s
JOIN team t ON s.idteam = t.idteam,
(SELECT @curRank := 0) r

```

-- WHERE s.idseason = 2 # Uncomment to specify which season to show ranking for

ORDER BY win_pct DESC

);

query-plan5.png

id	select_type	table	partitions	type	possible_keys	key	key_len	ref	rows	filtered	Extra
1	1 PRIMARY	<derived2>	<null>	system	<null>	<null>	<null>	<null>	1	100	Using temporary; Using filesort
2	1 PRIMARY	t	<null>	ALL	PRIMARY	<null>	<null>	<null>	30	100	<null>
3	1 PRIMARY	<derived3>	<null>	ref	<auto_key0>	<auto_key0>	4	njba.t.idteam	5492917	100	<null>
4	3 DERIVED	<derived4>	<null>	ALL	<null>	<null>	<null>	<null>	549291717	100	Using temporary; Using filesort
5	4 DERIVED	t	<null>	ALL	<null>	<null>	<null>	<null>	30	100	<null>
6	4 DERIVED	<derived9>	<null>	ALL	<null>	<null>	<null>	<null>	18309725	100	Using join buffer (Block Nested Loop)
7	9 DERIVED	<derived11>	<null>	ALL	<null>	<null>	<null>	<null>	2034407	100	Using temporary
8	9 DERIVED	<derived10>	<null>	ref	<auto_key0>	<auto_key0>	4	t1.idgame	10	90	Using where
9	10 DERIVED	t	<null>	ALL	PRIMARY	<null>	<null>	<null>	30	100	Using temporary; Using filesort
10	10 DERIVED	b	<null>	ref	fk_box_score_game1_idx, fk_box_score_team1_idx	fk_box_score_team1_idx	4	njba.t.idteam	67813	100	<null>
11	10 DERIVED	g	<null>	ref	PRIMARY	PRIMARY	4	njba.b.game_idgame	1	100	<null>
12	11 DERIVED	t	<null>	ALL	PRIMARY	<null>	<null>	<null>	30	100	Using temporary; Using filesort
13	11 DERIVED	b	<null>	ref	fk_box_score_game1_idx, fk_box_score_team1_idx	fk_box_score_team1_idx	4	njba.t.idteam	67813	100	<null>
14	11 DERIVED	g	<null>	ref	PRIMARY	PRIMARY	4	njba.b.game_idgame	1	100	<null>
15	5 DEPENDENT SUBQUERY	t	<null>	eq_ref	PRIMARY	PRIMARY	4	s.win_team_id	1	100	Using where
16	6 DEPENDENT SUBQUERY	t	<null>	eq_ref	PRIMARY	PRIMARY	4	s.loss_team_id	1	100	Using where
17	7 DEPENDENT SUBQUERY	t	<null>	eq_ref	PRIMARY	PRIMARY	4	s.win_team_id	1	100	Using where
18	8 DEPENDENT SUBQUERY	t	<null>	eq_ref	PRIMARY	PRIMARY	4	s.loss_team_id	1	100	Using where
19	2 DERIVED	<null>	<null>	<null>	<null>	<null>	<null>	<null>	<null>	<null>	No tables used

8. As a Fan, I want to view player stats so that I can see a player's averages over various time periods (e.g. month-to-month stats, season averages, etc.)

2 Sub-tasks

1. Need to create a totals view that records number of games played by a team in a given period

e.g. games_played VIEW attributes -> date, teamid, played_game

2. Need to create a standings view that summarizes each team based ON totals view

-- Traditional Stats

Stat | Name | Formula

_____ / _____

gp | Games Played |

min | Minutes Played |

pts | Points |

fgm | Field Goals Made |

fga | Field Goals Attempted |

fg_pct | Field Goal Percentage | (FGM / FGA) * 100

fg3 | 3 Point Field Goals Made |

fg3a | 3 Point Field Goals Attempted |

fg3_pct | 3 Point Field Goals Percentage | (FG3 / FG3A) * 100

ft | Free Throws Made |

fta | Free Throws Attempted |

ft_pct | Free Throw Percentage | (FT / FTA) * 100

orb | Offensive Rebounds |

drb | Defensive Rebounds |

# trb	/ Total Rebounds	/	#
# ast	/ Assists	/	#
# fouls	/ Fouls	/	#
# blk	/ Blocks	/	#
# tov	/ Turnovers	/	#
#	/	/	#

-- Player Averages

EXPLAIN EXTENDED

(

```

SELECT t.team_name,
       p.full_name,
       AVG(mins) AS mins,
       AVG(fgm) AS fgm,
       AVG(fga) AS fga,
CASE
  WHEN
    fga <> 0
  THEN
    ROUND((AVG(fgm) / AVG(fga)) * 100, 1)
  ELSE 0
END AS fg_pct,
AVG(fg3) AS fg3,
AVG(fg3a) AS fg3a,
CASE
  WHEN
    fg3a <> 0
  THEN
    ROUND((AVG(fg3) / AVG(fg3a)) * 100, 1)
  ELSE 0
END AS fg3_pct,
AVG(ft) AS ft,
AVG(fa) AS fa,
CASE
  WHEN
    fa <> 0
  THEN

```



```

ROUND((AVG(ft) / AVG(fa)) * 100, 1)
ELSE 0
END AS ft_pct,
AVG(orb) AS orb,
AVG(drb) AS drb,
AVG(trb) AS trb,
AVG(Ast) AS assists,
AVG(blk) AS blocks,
AVG(tov) AS turnovers,
AVG(fouls) AS fouls,
AVG(pts) AS points
FROM game g
JOIN box_score b
ON g.idgame = b.game_idgame
JOIN player p
ON b.player_idplayer = p.idplayer
JOIN team t
ON b.team_idteam = t.idteam
WHERE g.date BETWEEN start_date() AND end_date()
GROUP BY 1, 2
ORDER BY 1, 2 ASC
);

```

query-plan6.png

	id	select_type	table	type	possible_keys	key	key_len	ref	rows	filtered	Extra
1	1	SIMPLE	g	ALL	PRIMARY	<null>	<null>	<null>	130102	11.11	Using where; Using temporary;
2	1	SIMPLE	b	ref	PRIMARY, fk_box_score_player1_idx, fk_box_score_game1_idx, fk_box_score_team1_idx	fk_box_score_game1_idx	4	njba.g.idgame	27	100	<null>
3	1	SIMPLE	t	eq_ref	PRIMARY	PRIMARY	4	njba.b.team_idteam	1	100	<null>
4	1	SIMPLE	p	eq_ref	PRIMARY	PRIMARY	4	njba.b.player_idplayer	1	100	<null>

-- Player Sum (Raw Scores)

EXPLAIN EXTENDED

```

(
SELECT t.team_name,
p.full_name,
SUM(mins) AS mins,
SUM(fgm) AS fgm,
SUM(fga) AS fga,
CASE
WHEN
fga <> 0

```

```

        THEN
            ROUND((SUM(fgm) / SUM(fga)) * 100, 1)
        ELSE 0
    END AS fg_pct,
    SUM(fg3) AS fg3,
    SUM(fg3a) AS fg3a,
CASE
    WHEN
        fg3a <> 0
        THEN
            ROUND((SUM(fg3) / SUM(fg3a)) * 100, 1)
        ELSE 0
    END AS fg3_pct,
    SUM(ft) AS ft,
    SUM(fa) AS fa,
CASE
    WHEN
        fa <> 0
        THEN
            ROUND((SUM(ft) / SUM(fa)) * 100, 1)
        ELSE 0
    END AS ft_pct,
    SUM(orb) AS orb,
    SUM(drb) AS drb,
    SUM(trb) AS trb,
    SUM(Asst) AS assists,
    SUM(blk) AS blocks,
    SUM(ovr) AS turnovers,
    SUM(fouls) AS fouls,
    SUM(pts) AS points
FROM game g
    JOIN box_score b
        ON g.idgame = b.game_idgame
    JOIN player p
        ON b.player_idplayer = p.idplayer
    JOIN team t
        ON b.team_idteam = t.idteam
    JOIN games_played gp
        ON t.team_name = gp.team_name

```

```

WHERE g.date BETWEEN start_date() AND end_date()
GROUP BY 1, 2
ORDER BY 1, 2 ASC
);

```

query-plan7.png

	id	select_type	table	type	possible_keys	key	key_len	ref	rows	filtered	Extra
1	1	PRIMARY	b	ALL	PRIMARY, fk_box_score_player1_idx, fk_box_score_game1_idx, fk_box_score_team1_idx	<null>	<null>	<null>	1966594	100	Using temporary; Using filesort
2	1	PRIMARY	t	eq_ref	PRIMARY	PRIMARY	4	njba.b.team_idteam	1	100	<null>
3	1	PRIMARY	p	eq_ref	PRIMARY	PRIMARY	4	njba.b.player_idplayer	1	100	<null>
4	1	PRIMARY	g	ref	PRIMARY	PRIMARY	4	njba.b.game_idgame	1	11.11	Using where
5	1	PRIMARY		<derived2> ref	<auto_key0>	<auto_key0>	47	njba.t.team_name	93	100	<null>
6	2	DERIVED		<derived3> ALL	<null>	<null>	<null>	<null>	9338	100	Using temporary; Using filesort
7	3	DERIVED	team	ALL	<null>	<null>	<null>	<null>	30	100	Using temporary; Using filesort
8	3	DERIVED		<derived6> ref	<auto_key1>	<auto_key1>	48	njba.team.team_name	1401	11.11	Using where
9	6	DERIVED	g	ALL	<null>	<null>	<null>	<null>	130102	100	<null>
10	7	DEPENDENT SUBQUERY	team	eq_ref	PRIMARY	PRIMARY	4	njba.g.away_team_id	1	100	<null>
11	8	DEPENDENT SUBQUERY	team	eq_ref	PRIMARY	PRIMARY	4	njba.g.home_team_id	1	100	<null>
12	4	UNION	team	ALL	<null>	<null>	<null>	<null>	30	100	Using temporary; Using filesort
13	4	UNION		<derived9> ref	<auto_key1>	<auto_key1>	48	njba.team.team_name	1401	11.11	Using where
14	9	DERIVED	g	ALL	<null>	<null>	<null>	<null>	130102	100	<null>
15	10	DEPENDENT SUBQUERY	team	eq_ref	PRIMARY	PRIMARY	4	njba.g.away_team_id	1	100	<null>
16	11	DEPENDENT SUBQUERY	team	eq_ref	PRIMARY	PRIMARY	4	njba.g.home_team_id	1	100	<null>

-- Games Played Totals

EXPLAIN EXTENDED

```

(
SELECT team_name, sum(games_played) games_played
FROM
(
SELECT count(*) AS games_played, team_name
FROM schedule s
JOIN team
ON team_name = home
WHERE date BETWEEN start_date() AND end_date()
GROUP BY team_name

UNION ALL

SELECT count(*) AS games_played, team_name
FROM schedule s
JOIN team ON team_name = away
WHERE date BETWEEN start_date() AND end_date()
GROUP BY team_name
) AS game_total
GROUP BY team_name
);

```

query-plan8.png

	id	select_type	table	partitions	type	possible_keys	key	key_len	ref	rows	filtered	Extra
1	1	PRIMARY	<derived2>	<null>	ALL	<null>	<null>	<null>	<null>	9338	100	Using temporary; Using filesort
2	2	DERIVED	team	<null>	ALL	<null>	<null>	<null>	<null>	30	100	Using temporary; Using filesort
3	2	DERIVED	<derived4>	<null>	ref	<auto_key1>	<auto_key1>	48	njba.team.team_name	1401	11.11	Using where
4	4	DERIVED	g	<null>	ALL	<null>	<null>	<null>	<null>	130102	100	<null>
5	5	DEPENDENT SUBQUERY	team	<null>	eq_ref	PRIMARY	PRIMARY	4	njba.g.away_team_id	1	100	<null>
6	6	DEPENDENT SUBQUERY	team	<null>	eq_ref	PRIMARY	PRIMARY	4	njba.g.home_team_id	1	100	<null>
7	3	UNION	team	<null>	ALL	<null>	<null>	<null>	<null>	30	100	Using temporary; Using filesort
8	3	UNION	<derived7>	<null>	ref	<auto_key1>	<auto_key1>	48	njba.team.team_name	1401	11.11	Using where
9	7	DERIVED	g	<null>	ALL	<null>	<null>	<null>	<null>	130102	100	<null>
10	8	DEPENDENT SUBQUERY	team	<null>	eq_ref	PRIMARY	PRIMARY	4	njba.g.away_team_id	1	100	<null>
11	9	DEPENDENT SUBQUERY	team	<null>	eq_ref	PRIMARY	PRIMARY	4	njba.g.home_team_id	1	100	<null>

9. As a *Fan*, I want to view team stats so that I can see a team's averages over various time periods (e.g. month-to-month stats, season averages, etc.)

-- Traditional Stats

#	Stat	Name	Formula	#
#				#
# gp	Games Played			#
# min	Minutes Played			#
# pts	Points			#
# fgm	Field Goals Made			#
# fga	Field Goals Attempted			#
# fg_pct	Field Goal Percentage	(FGM / FGA) * 100		#
# fg3	3 Point Field Goals Made			#
# fg3a	3 Point Field Goals Attempted			#
# fg3_pct	3 Point Field Goals Percentage	(FG3 / FG3A) * 100		#
# ft	Free Throws Made			#
# fta	Free Throws Attempted			#
# ft_pct	Free Throw Percentage	(FT / FTA) * 100		#
# orb	Offensive Rebounds			#
# drb	Defensive Rebounds			#
# trb	Total Rebounds			#
# ast	Assists			#
# fouls	Fouls			#
# blk	Blocks			#
# tov	Turnovers			#
#				#

-- Team Averages

EXPLAIN EXTENDED

(

```
SELECT t.team_name,
       ROUND(SUM(mins) / gp.games_played), 0) AS mins,
```

```

ROUND(SUM(fgm) / gp.games_played, 0)          AS team_fgm,
ROUND(SUM(fga) / gp.games_played, 0)          AS team_fga,
ROUND((ROUND(SUM(fgm) / gp.games_played, 0) /
        ROUND(SUM(fga) / gp.games_played, 0)) * 100, 1) AS team_fg_pct,
ROUND(SUM(fg3) / gp.games_played, 0)          AS team_fg3,
ROUND(SUM(fg3a) / gp.games_played, 0)         AS team_fg3a,
ROUND((ROUND(SUM(fg3) / gp.games_played, 0) /
        ROUND(SUM(fg3a) / gp.games_played, 0)) * 100, 1) AS team_fg3_pct,
ROUND(SUM(ft) / gp.games_played, 0)           AS team_ft,
ROUND(SUM(fa) / gp.games_played, 0)           AS team_fta,
ROUND((ROUND(SUM(ft) / gp.games_played, 0) /
        ROUND(SUM(fa) / gp.games_played, 0)) * 100, 1) AS team_ft_pct,
ROUND(SUM(orb) / gp.games_played, 0)          AS team_orb,
ROUND(SUM(drb) / gp.games_played, 0)          AS team_drb,
ROUND(SUM(trb) / gp.games_played, 0)          AS team_trb,
ROUND(SUM(ast) / gp.games_played, 0)          AS team_assists,
ROUND(SUM(blk) / gp.games_played, 0)          AS team_blocks,
ROUND(SUM(tov) / gp.games_played, 0)          AS team_turnovers,
ROUND(SUM(fouls) / gp.games_played, 0)        AS team_fouls,
ROUND(SUM(pts) / gp.games_played, 0)          AS team_points

```

FROM game g

JOIN box_score b

ON idgame = game_idgame

JOIN team t

ON team_idteam = idteam

JOIN games_played gp

ON t.team_name = gp.team_name

WHERE g.date BETWEEN start_date() AND end_date()

GROUP BY 1

ORDER BY 1 ASC

);

query-plan9.png

	id	select_type	table	partitions	type	possible_keys	key	key_len	ref	rows	filtered	Extra
1	1	PRIMARY	b	<null>	ALL	fk_box_score_game1_idx, fk_box_score_team1_idx	<null>	<null>	<null>	1966594	100	Using temporary; Using filesort
2	1	PRIMARY	t	<null>	eq_ref	PRIMARY	PRIMARY	4	njba.b.team_idteam	1	100	<null>
3	1	PRIMARY	g	<null>	ref	PRIMARY	PRIMARY	4	njba.b.game_idgame	1	11.11	Using where
4	1	PRIMARY	<derived2>	<null>	ref	<auto_key0>	<auto_key0>	47	njba.t.team_name	93	100	<null>
5	2	DERIVED	<derived3>	<null>	ALL	<null>	<null>	<null>	<null>	9338	100	Using temporary; Using filesort
6	3	DERIVED	team	<null>	ALL	<null>	<null>	<null>	<null>	30	100	Using temporary; Using filesort
7	3	DERIVED	<derived6>	<null>	ref	<auto_key1>	<auto_key1>	48	njba.team.team_name	1401	11.11	Using where
8	6	DERIVED	g	<null>	ALL	<null>	<null>	<null>	<null>	130102	100	<null>
9	7	DEPENDENT SUBQUERY	team	<null>	eq_ref	PRIMARY	PRIMARY	4	njba.g.away_team_id	1	100	<null>
10	8	DEPENDENT SUBQUERY	team	<null>	eq_ref	PRIMARY	PRIMARY	4	njba.g.home_team_id	1	100	<null>
11	4	UNION	team	<null>	ALL	<null>	<null>	<null>	<null>	30	100	Using temporary; Using filesort
12	4	UNION	<derived9>	<null>	ref	<auto_key1>	<auto_key1>	48	njba.team.team_name	1401	11.11	Using where
13	9	DERIVED	g	<null>	ALL	<null>	<null>	<null>	<null>	130102	100	<null>
14	10	DEPENDENT SUBQUERY	team	<null>	eq_ref	PRIMARY	PRIMARY	4	njba.g.away_team_id	1	100	<null>
15	11	DEPENDENT SUBQUERY	team	<null>	eq_ref	PRIMARY	PRIMARY	4	njba.g.home_team_id	1	100	<null>

-- Team Totals (Raw Scores)

EXPLAIN EXTENDED

(

```
SELECT t.team_name,  
       ROUND(SUM(mins), 0)           AS mins,  
       SUM(fgm)                     AS team_fgm,  
       SUM(fga)                     AS team_fga,  
       ROUND((SUM(fgm) / SUM(fga)) * 100, 1) AS team_fg_pct,  
       SUM(fg3)                     AS team_fg3,  
       SUM(fg3a)                    AS team_fg3a,  
       ROUND((SUM(fg3) / SUM(fg3a)) * 100, 1) AS team_fg3_pct,  
       SUM(ft)                      AS team_ft,  
       SUM(fa)                      AS team_fta,  
       ROUND((SUM(ft) / SUM(fa)) * 100, 1) AS team_ft_pct,  
       SUM(orb)                     AS team_orb,  
       SUM(drb)                     AS team_drb,  
       SUM(trb)                     AS team_trb,  
       SUM(Asst)                    AS team_assists,  
       SUM(blk)                     AS team_blocks,  
       SUM(ov)                      AS team_turnovers,  
       SUM(fouls)                   AS team_fouls,  
       SUM(pts)                     AS team_points
```

```
FROM game g  
      JOIN box_score b  
        ON idgame = game_idgame  
      JOIN team t  
        ON team_idteam = idteam  
      JOIN games_played gp  
        ON t.team_name = gp.team_name  
WHERE g.date BETWEEN start_date() AND end_date()  
GROUP BY 1  
ORDER BY 1 ASC
```

);

[query-plan10.png](#)

	id	select_type	table	partitions	type	possible_keys	key	key_len	ref	rows	filtered	Extra
1	1	PRIMARY	b	<null>	ALL	fk_box_score_game1_idx, fk_box_score_team1_idx	<null>	<null>	<null>	1966594	100	Using temporary; Using filesort
2	1	PRIMARY	t	<null>	eq_ref	PRIMARY	PRIMARY	4	njba.b.team_idteam	1	100	<null>
3	1	PRIMARY	g	<null>	ref	PRIMARY	PRIMARY	4	njba.b.game_idgame	1	11.11	Using where
4	1	PRIMARY	<derived2>	<null>	ref	<auto_key0>	<auto_key0>	47	njba.t.team_name	93	100	<null>
5	2	DERIVED	<derived3>	<null>	ALL	<null>	<null>	<null>	<null>	9338	100	Using temporary; Using filesort
6	3	DERIVED	team	<null>	ALL	<null>	<null>	<null>	<null>	30	100	Using temporary; Using filesort
7	3	DERIVED	<derived6>	<null>	ref	<auto_key1>	<auto_key1>	48	njba.team.team_name	1401	11.11	Using where
8	6	DERIVED	g	<null>	ALL	<null>	<null>	<null>	<null>	130102	100	<null>
9	7	DEPENDENT SUBQUERY	team	<null>	eq_ref	PRIMARY	PRIMARY	4	njba.g.away_team_id	1	100	<null>
10	8	DEPENDENT SUBQUERY	team	<null>	eq_ref	PRIMARY	PRIMARY	4	njba.g.home_team_id	1	100	<null>
11	4	UNION	team	<null>	ALL	<null>	<null>	<null>	<null>	30	100	Using temporary; Using filesort
12	4	UNION	<derived9>	<null>	ref	<auto_key1>	<auto_key1>	48	njba.team.team_name	1401	11.11	Using where
13	9	DERIVED	g	<null>	ALL	<null>	<null>	<null>	<null>	130102	100	<null>
14	10	DEPENDENT SUBQUERY	team	<null>	eq_ref	PRIMARY	PRIMARY	4	njba.g.away_team_id	1	100	<null>
15	11	DEPENDENT SUBQUERY	team	<null>	eq_ref	PRIMARY	PRIMARY	4	njba.g.home_team_id	1	100	<null>

18. As a *Fan*, I want to view a ‘Top Player Stats’ leaderboard so that I can see which player is the top ranked player in each statistical category

EXPLAIN EXTENDED

```
(
  SELECT team_name,
         full_name,
         ROUND(fgm, 0)      AS fgm,
         ROUND(fga, 0)      AS fga,
         fg_pct,
         ROUND(fg3, 0)      AS fg3,
         ROUND(fg3a, 0)     AS fg3a,
         fg3_pct,
         ROUND(ft, 0)       AS ft,
         ROUND(fa, 0)       AS fa,
         ft_pct,
         ROUND(orb, 0)      AS orb,
         ROUND(drb, 0)      AS drb,
         ROUND(trb, 0)      AS trb,
         ROUND(assists, 0)   AS ast,
         ROUND(blocks, 0)   AS blk,
         ROUND(turnovers, 0) AS tov,
         ROUND(fouls, 0)    AS fouls,
         ROUND(points, 0)    AS pts,
         @curRank := @curRank + 1 AS ranks
  FROM player_avg p,
       (SELECT @curRank := 0) r
  -- Stat Filter
  ORDER BY pts DESC
);
```

query-plan11.png

id	select_type	table	type	possible_keys	key	key_len	ref	rows	filtered	Extra
1	1 PRIMARY	<derived2>	system	<null>	<null>	<null>	<null>	1	100	Using filesort
2	1 PRIMARY	<derived3>	ALL	<null>	<null>	<null>	<null>	394753	100	<null>
3	3 DERIVED	g	ALL	PRIMARY	<null>	<null>	<null>	130102	11.11	Using where; Using temporary
4	3 DERIVED	b	ref	PRIMARY, fk_box_score_player1_idx, fk_box_score_game1_idx, fk_box_score_team1_idx	fk_box_score_game1_idx	4	njba.g.idgame	27	100	<null>
5	3 DERIVED	t	eq_ref	PRIMARY	PRIMARY	4	njba.b.team_idteam	1	100	<null>
6	3 DERIVED	p	eq_ref	PRIMARY	PRIMARY	4	njba.b.player_idplayer	1	100	<null>
7	2 DERIVED	<null>	<null>	<null>	<null>	<null>	<null>	<null>	<null>	No tables used

19. As a *Fan*, I want to view a 'Top Team Stats' leaderboard so that I can see which team is the top ranked team in each statistical category

EXPLAIN EXTENDED

```
(
SELECT team_name,
      ROUND(team_fgm, 0) AS team_fgm,
      ROUND(team_fga, 0) AS team_fga,
      team_fg_pct,
      ROUND(team_fg3, 0) AS team_fg3,
      ROUND(team_fg3a, 0) AS team_fg3a,
      team_fg3_pct,
      ROUND(team_ft, 0) AS team_ft,
      ROUND(team_fta, 0) AS team_fta,
      team_ft_pct,
      ROUND(team_orb, 0) AS team_orb,
      ROUND(team_drb, 0) AS team_drb,
      ROUND(team_trb, 0) AS team_trb,
      ROUND(team_assists, 0) AS team_ast,
      ROUND(team_blocks, 0) AS team_blk,
      ROUND(team_turnovers, 0) AS team_tov,
      ROUND(team_fouls, 0) AS team_fouls,
      ROUND(team_points, 0) AS team_pts,
      @curRank := @curRank + 1 AS ranks
FROM team_avg t,
      (SELECT @curRank := 0) r
      -- Stat Filter
ORDER BY team_pts DESC
);
```

query-plan12.png

	id	select_type	table	partitions	type	possible_keys	key	key_len	ref	rows	filtered	Extra
1	1	PRIMARY	<derived2>	<null>	system	<null>	<null>	<null>	<null>	1	100	Using filesort
2	1	PRIMARY	<derived3>	<null>	ALL	<null>	<null>	<null>	<null>	20402465	100	<null>
3	3	DERIVED	b	<null>	ALL	fk_box_score_game1_idx, fk_box_score_team1_idx	<null>	<null>	<null>	1966594	100	Using temporary; Using filesort
4	3	DERIVED	t	<null>	eq_ref	PRIMARY	PRIMARY	4	njba.b.team_idteam	1	100	<null>
5	3	DERIVED	g	<null>	ref	PRIMARY	PRIMARY	4	njba.b.game_idgame	1	11.11	Using where
6	3	DERIVED	<derived4>	<null>	ref	<auto_key0>	<auto_key0>	47	njba.t.team_name	93	100	<null>
7	4	DERIVED	<derived5>	<null>	ALL	<null>	<null>	<null>	<null>	9338	100	Using temporary; Using filesort
8	5	DERIVED	team	<null>	ALL	<null>	<null>	<null>	<null>	30	100	Using temporary; Using filesort
9	5	DERIVED	<derived8>	<null>	ref	<auto_key1>	<auto_key1>	48	njba.team.team_name	1401	11.11	Using where
10	8	DERIVED	g	<null>	ALL	<null>	<null>	<null>	<null>	130102	100	<null>
11	9	DEPENDENT SUBQUERY	team	<null>	eq_ref	PRIMARY	PRIMARY	4	njba.g.away_team_id	1	100	<null>
12	10	DEPENDENT SUBQUERY	team	<null>	eq_ref	PRIMARY	PRIMARY	4	njba.g.home_team_id	1	100	<null>
13	6	UNION	team	<null>	ALL	<null>	<null>	<null>	<null>	30	100	Using temporary; Using filesort
14	6	UNION	<derived11>	<null>	ref	<auto_key1>	<auto_key1>	48	njba.team.team_name	1401	11.11	Using where
15	11	DERIVED	g	<null>	ALL	<null>	<null>	<null>	<null>	130102	100	<null>
16	12	DEPENDENT SUBQUERY	team	<null>	eq_ref	PRIMARY	PRIMARY	4	njba.g.away_team_id	1	100	<null>
17	13	DEPENDENT SUBQUERY	team	<null>	eq_ref	PRIMARY	PRIMARY	4	njba.g.home_team_id	1	100	<null>
18	2	DERIVED	<null>	<null>	<null>	<null>	<null>	<null>	<null>	<null>	<null>	No tables used

-- Note: There are no user stories for displaying the Store data. Store is out of the scope of MVP.

-- =====

-- Additional Reporting/Analytics

-- =====

-- Advanced Stats

```
#
# Stat | Name | Formula #
#
# efg_pct | Effective Field Goal Percentage | (FG + 0.5 * 3P) / FGA #
# tsa | True Shooting Attempts | FGA + 0.475 * FTA #
# ts_pct | True Shooting Percentage | PTS / (2 * TSA) -> PTS / (2 * (FGA + 0.475 * FTA))#
# ftr | Free Throw Rate | FT / FGA #
# tov_pct | Turnover Percentage | 100 * TOV / (FGA + 0.44 * FTA + TOV) #
# gmsc | Game Score | PTS + 0.4 * FG - 0.7 * FGA - 0.4*(FTA - FT) + #
# | | 0.7 * ORB + 0.3 * DRB + STL + 0.7 * AST + 0.7 * #
# | | BLK - 0.4 * Fouls - TOV #
# | |
```

EXPLAIN EXTENDED

```
(
SELECT t.team_name,
p.full_name,
ROUND((SUM(fgm + fg3) + 0.5 * fg3) / SUM(fga + fg3a) * 100, 1) AS efg_pct,
ROUND(SUM(fga + fg3a) + 0.475 * fta, 1) AS tsa,
ROUND(points / (2 * (SUM(fga + fg3a) + 0.475 * fta)) * 100, 1) AS ts_pct,
ROUND(ft / SUM(fga + fg3a) * 100, 1) AS ftr,
ROUND(100 * turnovers / (SUM(fga + fg3a) + 0.44 * fta + turnovers), 1) AS tov_pct,
ROUND((points + 0.4 * SUM(fga + fg3a) - 0.7 * fga -
0.4 * (ft - ft) + 0.7 * orb + 0.3 * drb + 0.7 *
```

```

        assists + 0.7 * blocks - 0.4 * Fouls - turnovers), 1) AS gmsc
FROM player_raw pr
    JOIN player p
        ON pr.full_name = p.full_name
    JOIN team t
        ON pr.team_name = t.team_name
    JOIN games_played gp
        ON t.team_name = gp.team_name
GROUP BY 1, 2
ORDER BY 1, 2 ASC
);

```