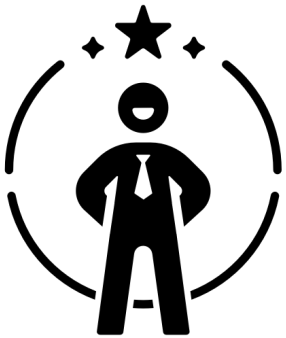
NBA Stats Analysis

Thanakrit Daorueang • 6010545773
Pichaaun Popukdee • 6010545862
Suparuk Jareonsuk • 6010545935

Overview

A web application that shows the statistics of the TOP 10 Teams also can see the ranking of the basketball team in this league in the past 5 years in a visualization that you easy to understand! Moreover, the comparison between the 2 teams competing together is provided too you can easily see the percentage of their winning rate!

Motivation

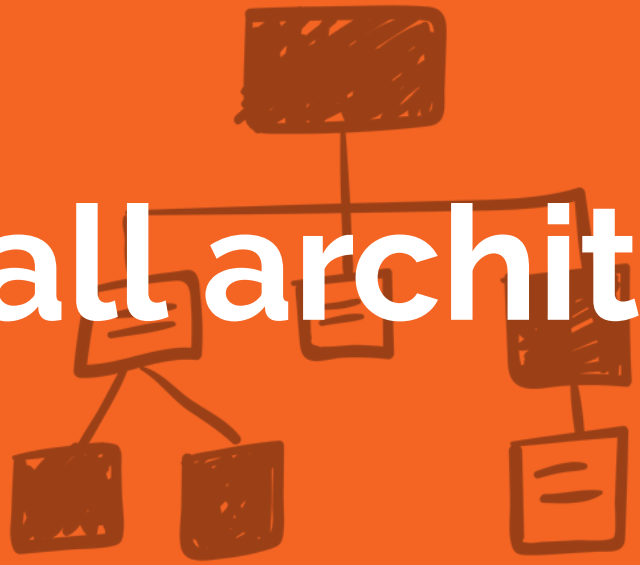


We want to study more structure about NBA overall score and also provide the analysis of the score which is easier than compute it by themselves.

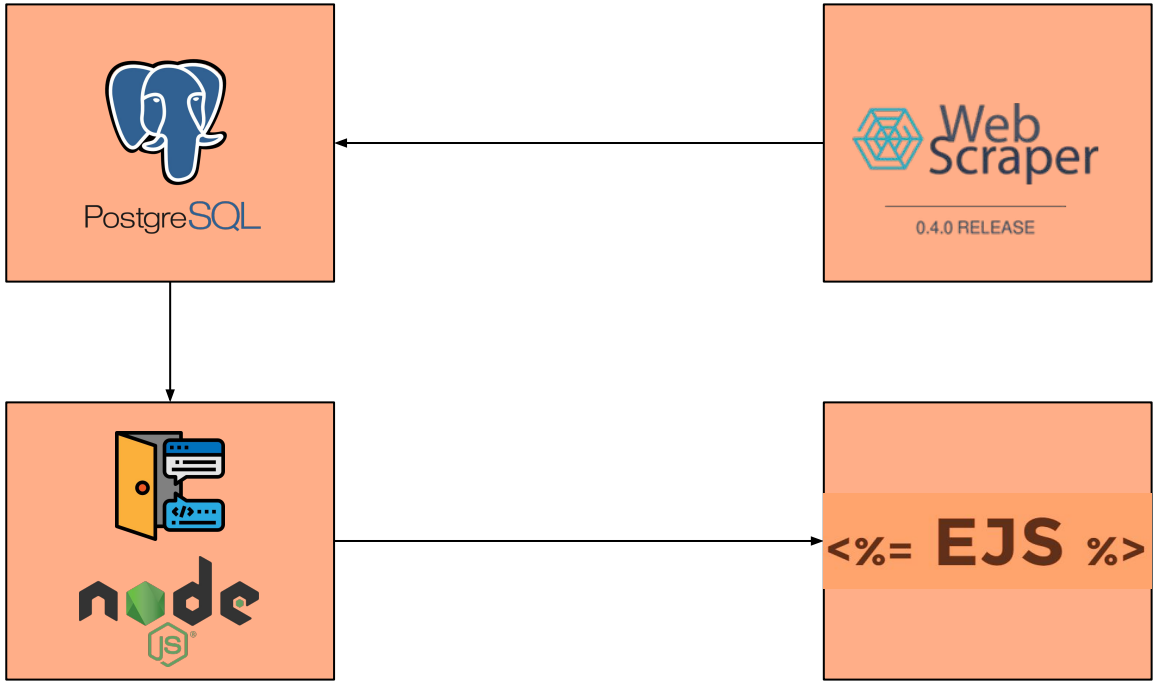
Pain point

The basketball score counting has many factors to compute but sometimes they just want to see the overall percentage of the basketball team winning rate between 2 teams because they don't want to waste time considering by themselves. So they don’t have to compare it by themselves.

Overall architecture



Architecture



NodeJs

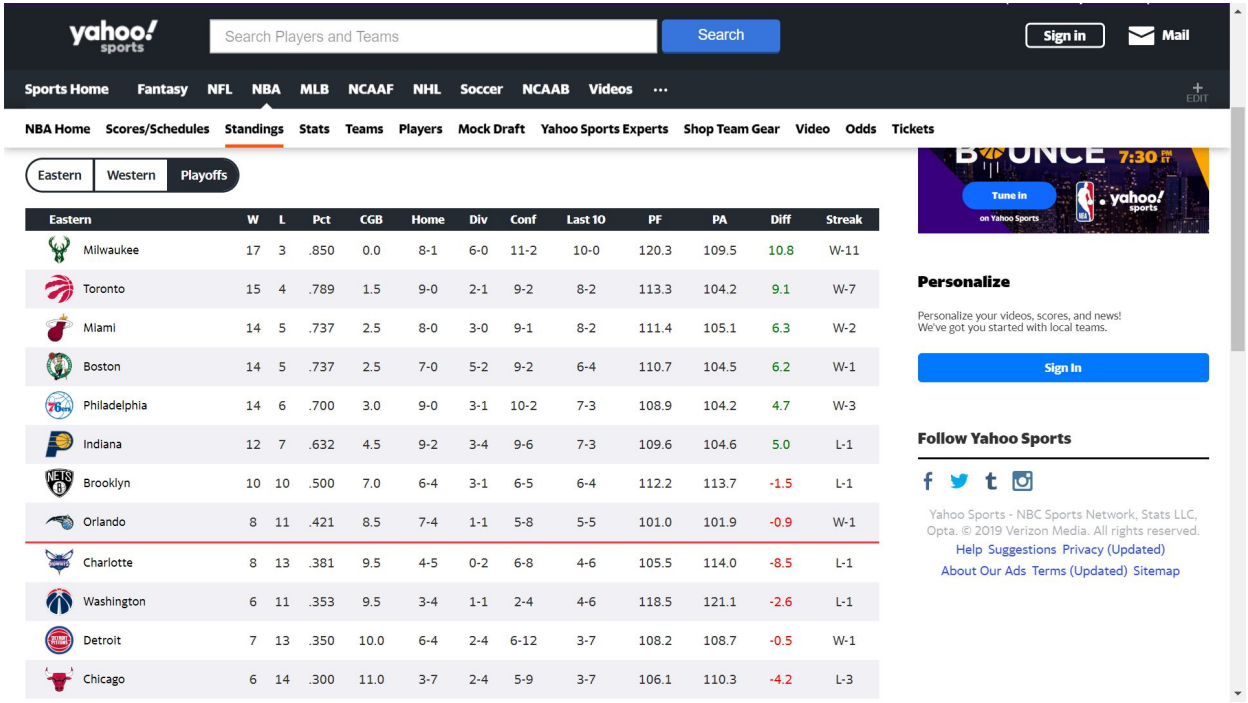
- We use node js as the backend

Express

- We use the express to provide the webservice with EJS as the template engine .

Data sources

Yahoo! sports NBA



Eastern	W	L	Pct	CGB	Home	Div	Conf	Last 10	PF	PA	Diff	Streak
Milwaukee	17	3	.850	0.0	8-1	6-0	11-2	10-0	120.3	109.5	10.8	W-11
Toronto	15	4	.789	1.5	9-0	2-1	9-2	8-2	113.3	104.2	9.1	W-7
Miami	14	5	.737	2.5	8-0	3-0	9-1	8-2	111.4	105.1	6.3	W-2
Boston	14	5	.737	2.5	7-0	5-2	9-2	6-4	110.7	104.5	6.2	W-1
Philadelphia	14	6	.700	3.0	9-0	3-1	10-2	7-3	108.9	104.2	4.7	W-3
Indiana	12	7	.632	4.5	9-2	3-4	9-6	7-3	109.6	104.6	5.0	L-1
Brooklyn	10	10	.500	7.0	6-4	3-1	6-5	6-4	112.2	113.7	-1.5	L-1
Orlando	8	11	.421	8.5	7-4	1-1	5-8	5-5	101.0	101.9	-0.9	W-1
Charlotte	8	13	.381	9.5	4-5	0-2	6-8	4-6	105.5	114.0	-8.5	L-1
Washington	6	11	.353	9.5	3-4	1-1	2-4	4-6	118.5	121.1	-2.6	L-1
Detroit	7	13	.350	10.0	6-4	2-4	6-12	3-7	108.2	108.7	-0.5	W-1
Chicago	6	14	.300	11.0	3-7	2-4	5-9	3-7	106.1	110.3	-4.2	L-3

Collection mechanisms

We use web scraper method to scrap the data from the Yahoo! sports

Web scraper with Yahoo! sports NBA

```
var eastHead;
var westHead;
var list_east_name = [];
var list_west_name = [];

const response = await axios(url)

const html = response.data;
const $ = cheerio.load(html);
const eastTable = $('table:nth-of-type(1) span:nth-of-type(2)');
const westTable = $('table:nth-of-type(2) span:nth-of-type(2)');

for (var i = 0; i < eastTable.length; i++) {
    list_east_name.push(eastTable[i].children[1].data);
    if (i == eastTable.length - 1) {
        eastHead = eastTable[i].children[1].data
    }
}

for (var i = 0; i < westTable.length; i++) {
    list_west_name.push(westTable[i].children[1].data);
    if (i == westTable.length - 1) {
        westHead = westTable[i].children[1].data
    }
}
```

We use the web scraper to obtain all NBA team name

Web scraper with Yahoo! sports NBA

```
const tableData = await scraper.get(url)

for (var i = 0; i < tableData[1].length; i++) {

    var east_data = {
        Team_name: list_east_name[i],
        Conference: 'Eastern',
        Rank: i + 1,
        W: tableData[1][i][eastHead],
        L: tableData[1][i]['W'],
        Pct: tableData[1][i]['L'],
        CGB: tableData[1][i]['GB'],
        Home: tableData[1][i]['CGB'],
        Div: tableData[1][i]['Home'],
        Conf: tableData[1][i]['Div'],
        Last10: tableData[1][i]['Conf'],
        PF: tableData[1][i]['Last 10'],
        PA: tableData[1][i]['PF'],
        Diff: tableData[1][i]['PA'],
        Streak: tableData[1][i]['Diff'],
        Year: year
    }
    eastData.push(east_data);
```

We use the **table-scraper** simple utility for scraping data from html tables on a given website into a list of value in standing board and then return to javascript objects

Database

Postgres

- The postgres is the sql database. It provides a ORDBMS structure and we decide to store the database in the local server for quick and convenient to use.

Database Schema

```
CREATE TABLE IF NOT EXISTS standing (
    id SERIAL PRIMARY KEY,
    rank INT,
    team_name VARCHAR(255),
    conference VARCHAR(255),
    year VARCHAR(255),
    w_score INT,
    l_score INT,
    pct_score FLOAT,
    cgb_score FLOAT,
    home_score VARCHAR(255),
    div_score VARCHAR(255),
    conf_score VARCHAR(255),
    l10_score VARCHAR(255),
    pf_score FLOAT,
    pa_score FLOAT,
    diff_score FLOAT,
    strk_score VARCHAR(255)
);
```

The standing table

- id is the primary key.
- rank : Rank of team in each conference each season.
- team_name : The official team name.
- conference : Divide the team is come from western or eastern side.
- year : the year of the competition.
- w_score : The number of win game in the season.

Database Schema

```
CREATE TABLE IF NOT EXISTS standing (
    id SERIAL PRIMARY KEY,
    rank INT,
    team_name VARCHAR(255),
    conference VARCHAR(255),
    year VARCHAR(255),
    w_score INT,
    l_score INT,
    pct_score FLOAT,
    cgb_score FLOAT,
    home_score VARCHAR(255),
    div_score VARCHAR(255),
    conf_score VARCHAR(255),
    l10_score VARCHAR(255),
    pf_score FLOAT,
    pa_score FLOAT,
    diff_score FLOAT,
    strk_score VARCHAR(255)
);
```

The standing table

- l_score : The number of lose game in the season.
- pct_score : The percentage to win.
- cgb_socre : The game behind score.
- home_score : The win/lose score in home.
- div_score : The win/lose in division.
- conf_score : The win/lose in the conference (East or West).

Database Schema

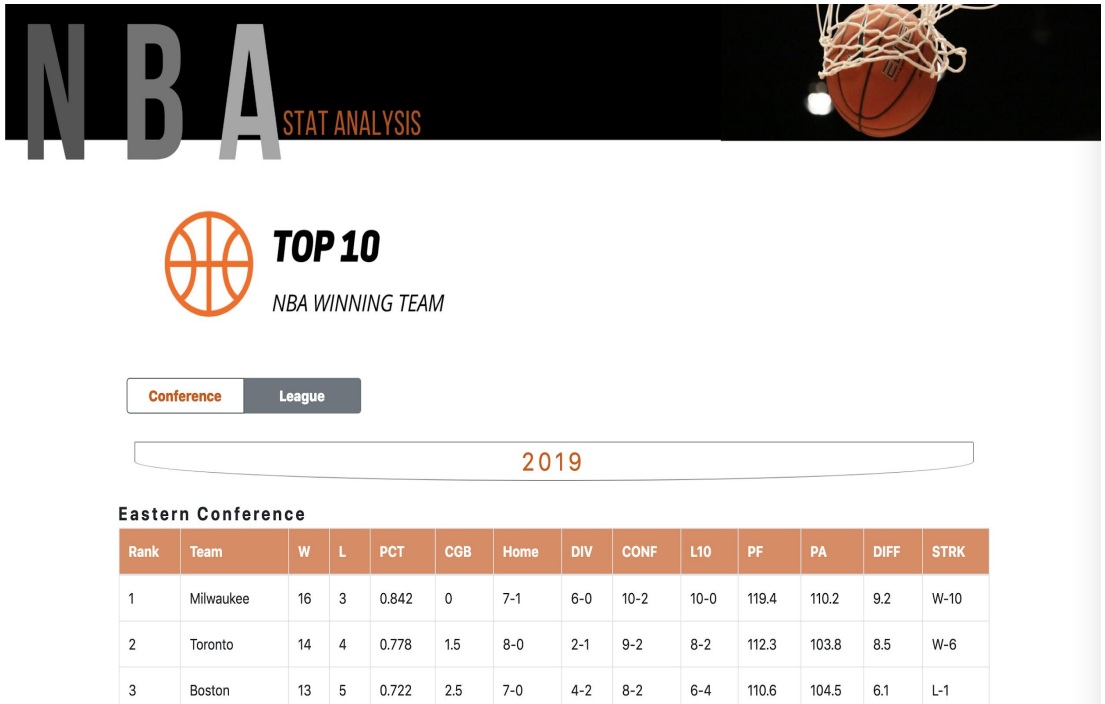
```
CREATE TABLE IF NOT EXISTS standing (
    id SERIAL PRIMARY KEY,
    rank INT,
    team_name VARCHAR(255),
    conference VARCHAR(255),
    year VARCHAR(255),
    w_score INT,
    l_score INT,
    pct_score FLOAT,
    cgb_score FLOAT,
    home_score VARCHAR(255),
    div_score VARCHAR(255),
    conf_score VARCHAR(255),
    l10_score VARCHAR(255),
    pf_score FLOAT,
    pa_score FLOAT,
    diff_score FLOAT,
    strk_score VARCHAR(255)
);
```

The standing table

- l10_score : The win/lose score in last ten games.
- pf_score : Personal fouls.
- pa_score : How many points a team is averaging.
- diff_score : The difference between the points scored and points against.
- strk_score : Current Streak, losing or winning in succession.

Data visualization

Table



Rank	Team	W	L	PCT	CGB	Home	DIV	CONF	L10	PF	PA	DIFF	STRK
1	Milwaukee	16	3	0.842	0	7-1	6-0	10-2	10-0	119.4	110.2	9.2	W-10
2	Toronto	14	4	0.778	1.5	8-0	2-1	9-2	8-2	112.3	103.8	8.5	W-6
3	Boston	13	5	0.722	2.5	7-0	4-2	8-2	6-4	110.6	104.5	6.1	L-1

On the first page of our website, the data that we scraped is visualized as tables. Each table shows the top 10 teams in standings table for the past 5 years, divided by the conference and the league.

Table

2018

Eastern Conference

Rank	Team	W	L	PCT	CGB	Home	DIV	CONF	L10	PF	PA	DIFF	STRK
1	Milwaukee	60	22	0.732	0	33-8	14-2	40-12	7-3	118.1	109.3	8.8	L-1
2	Toronto	58	24	0.707	2	32-9	12-4	36-16	7-3	114.4	108.4	6	W-2
3	Philadelphia	51	31	0.622	9	31-10	8-8	31-21	4-6	115.2	112.5	2.7	W-1
4	Boston	49	33	0.598	11	28-13	10-6	35-17	6-4	112.4	108	4.4	W-1
5	Indiana	48	34	0.585	12	29-12	11-5	33-19	4-6	108	104.7	3.3	W-1
6	Brooklyn	42	40	0.512	18	23-18	8-8	29-23	6-4	112.2	112.3	-0.1	W-3
7	Orlando	42	40	0.512	18	25-16	10-6	30-22	8-2	107.3	106.6	0.7	W-4
8	Detroit	41	41	0.5	19	26-15	8-8	27-25	4-6	107	107.3	-0.3	W-2
9	Charlotte	39	43	0.476	21	25-16	10-6	29-23	6-4	110.7	111.8	-1.1	L-1
10	Miami	39	43	0.476	21	19-22	7-9	23-29	4-6	105.7	105.9	-0.2	L-1
11	Washington	32	50	0.39	28	22-19	7-9	19-33	2-8	114	116.9	-2.9	L-4

Table

TOP 10

NBA WINNING TEAM

Conference | League

2019

League 2019

Rank	Team	W	L	PCT	CGB	Home	DIV	CONF	L10	PF	PA	DIFF	STRK
1	LA Lakers	17	2	0.895	0	9-1	3-1	12-1	10-0	112.8	103.5	9.3	W-10
2	Milwaukee	16	3	0.842	0	7-1	6-0	10-2	10-0	119.4	110.2	9.2	W-10
3	Denver	13	3	0.813	2.5	8-2	2-0	7-2	9-1	107.3	101.9	5.4	W-6
4	Toronto	14	4	0.778	1.5	8-0	2-1	9-2	8-2	112.3	103.8	8.5	W-6
5	Boston	13	5	0.722	2.5	7-0	4-2	8-2	6-4	110.6	104.5	6.1	L-1
6	Miami	13	5	0.722	2.5	8-0	3-0	8-1	7-3	111.5	105.1	6.4	W-1
7	LA Clippers	14	6	0.7	3.5	11-1	2-1	10-5	7-3	113.7	107.5	6.2	L-1

Chart

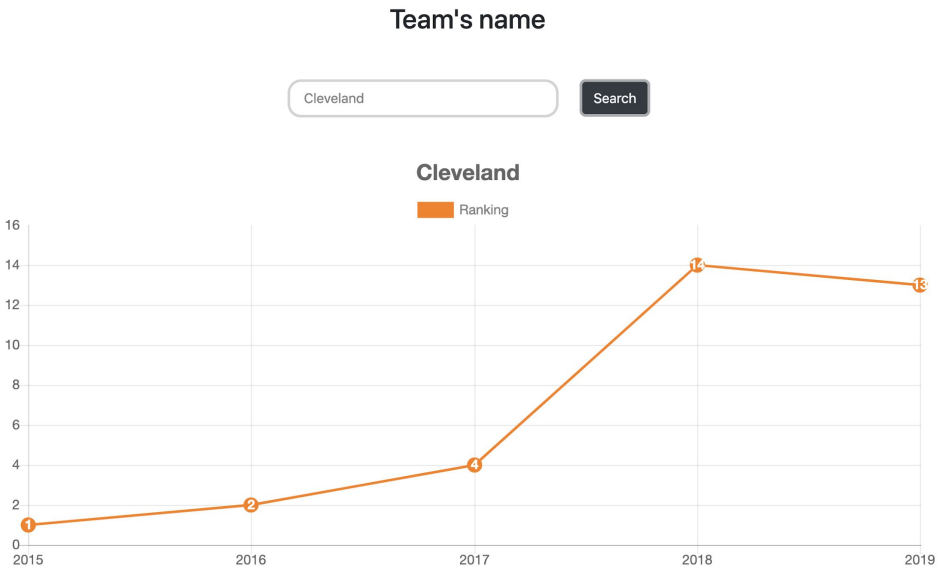
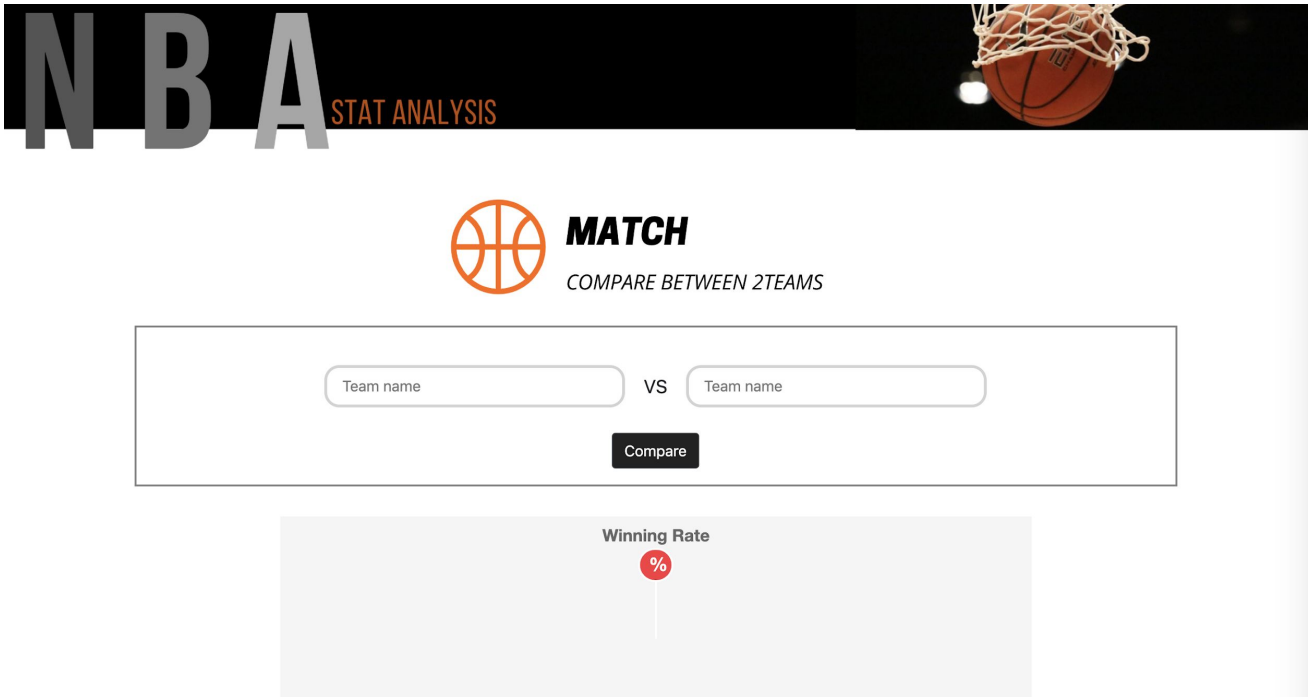


Chart.js

We use **Chartjs** to represent the winning rate and the rank for the past 5 years of each team. The rank of each team is represented in the form of a line chart.

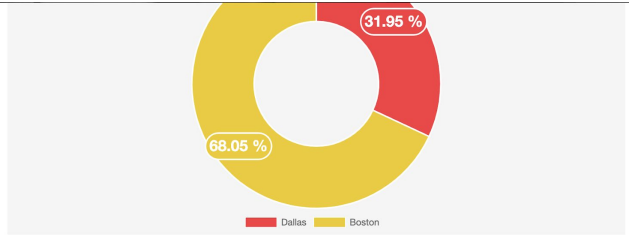
Moreover, the winning rate for 2 teams are represented in the form of a doughnut chart and also the ranking comparison of 2 teams is represented on a line chart.

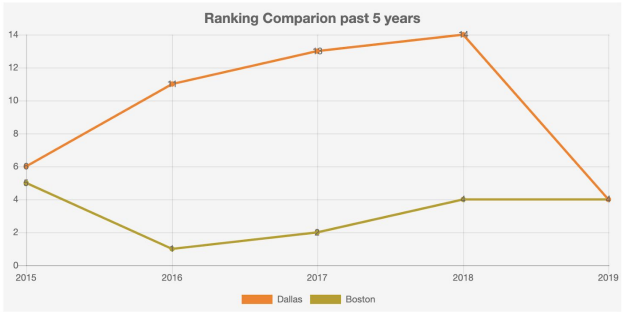
Chart


NBA
STAT ANALYSIS
MATCH
COMPARE BETWEEN 2TEAMS
Team name
VS
Team name
Compare
Winning Rate
%

Chart

We compute the winning rate by calculating the winning score of each team from the past 5 years and compute the percentage in the past 5 years they won. Then, compare it by using the difference of percentage.





DEMO

PROJECT URL

Github

http://bit.ly/2Y7nuqx