Analysis of Philadelphia 76ers Shot Data

## Philadelphia 76ers Shot Data

#Takes an NBA court image from the internet and assigns it to court. The image is a JPEG, so use the the readJPEG function.   
courtImg.jpg = "https://thedatagame.files.wordpress.com/2016/03/nba\_court.jpg"  
court <- rasterGrob(readJPEG("nba\_court.jpg"),   
 width=unit(1,"npc"), height=unit(1, "npc"))  
  
#Created four dataframes with Philadelphia 76ers shot data for 2005, 2010, 2015, and 2019 seasons using teams\_shots function.  
philly\_shots\_2005 = teams\_shots(teams = "Philadelphia 76ers", seasons = 2005)

## Philadelphia 76ers 2004-05 shot data

philly\_shots\_2010 = teams\_shots(teams = "Philadelphia 76ers", seasons = 2010)

## Philadelphia 76ers 2009-10 shot data

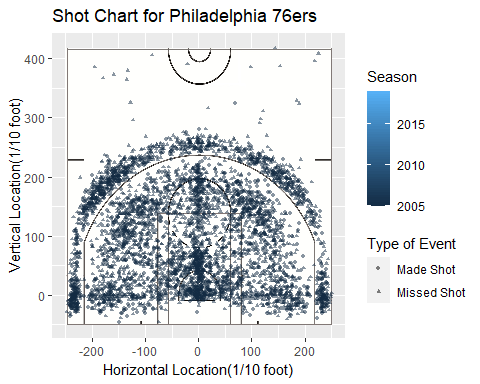
philly\_shots\_2015 = teams\_shots(teams = "Philadelphia 76ers", seasons = 2015)

## Philadelphia 76ers 2014-15 shot data

philly\_shots\_2019 = teams\_shots(teams = "Philadelphia 76ers", seasons = 2019)

## Philadelphia 76ers 2018-19 shot data

#Combined all of the rows from these four dataframes using the bind\_rows function. I can do this because all four dataframes have the same columns in the same order.   
philly\_shots\_all = bind\_rows(philly\_shots\_2005, philly\_shots\_2010, philly\_shots\_2015, philly\_shots\_2019)  
  
#Philadelphia shot data using ggplot and geom\_point functions. Assigned the graph to philly\_shot\_court. The color changes by the season, and the shape is determined by type of event. Alpha is the opacity level, which is set at 0.5.  
philly\_shot\_court = ggplot(philly\_shots\_all, aes(x=locationX, y=locationY), group = "yearSeason") +   
 annotation\_custom(court, -250, 250, -50, 420) +  
 geom\_point(aes(color = yearSeason, shape = typeEvent), size = 1, alpha = 0.50) +  
 xlim(-250, 250) +  
 ylim(-50, 420) +  
 ggtitle("Shot Chart for Philadelphia 76ers") +  
 xlab("Horizontal Location(1/10 foot)") +  
 ylab("Vertical Location(1/10 foot)") +  
 labs(shape = "Type of Event", color = "Season")  
  
#Using the same philly\_shot\_court variable and adding animation that transitions over seasons  
philly\_shot\_court +   
 transition\_states(yearSeason) +   
 enter\_fade() +  
 exit\_shrink()



## Philadelphia 76ers Findings

In the earlier seasons, specifically in 2005 and 2010, the shots are more evenly distributed throughout the half court without a distinct area on the court where a lot of shots occur. This transitions in seasons 2015 and 2019 where it is clearly shown that more shots are taken near the basket and right outside the three point line. Specifically with three point shots, the majority of those shots are taken from the edges of the three point line, or the corners of the court for all seasons. Similar to the three point shots, a large proportion of the two point shots are layup shots, which are shots taken near the basket. Also, as the year increases, a larger proportion of the shots are layup shots. From this graph, it shows that in the earlier seasons, the shots were more spread out without common shot areas on the court, and in the later seasons, a few common shot areas developed including layup shots near the basket, and three point shots just outside of the three point line. This could suggest that there was a change in strategy between 2010 and 2015 for where the shots should be taken.

## NBA Teams 2018 Data

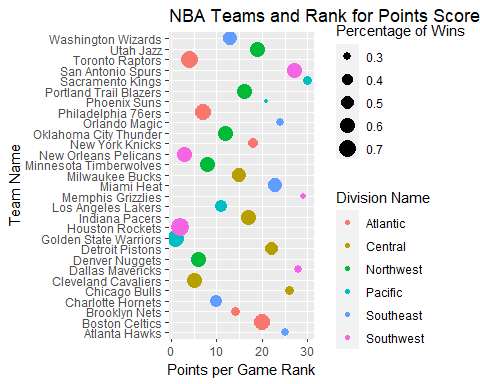
#Creates a dataframe called season\_standing\_2018 with standings data for all NBA teams during the 2018 regular season  
season\_standing\_2018 = standings(seasons = 2018, season\_types = c("Regular Season"), resolve\_records = TRUE, nest\_data = F, return\_message = TRUE)

## Getting 2017-18 Regular Season NBA standings data  
## Missing TeamSlug in dictionary  
## Missing ClinchedPlayIn in dictionary  
## Missing Score\_80\_Plus in dictionary  
## Missing Opp\_Score\_80\_Plus in dictionary  
## Missing Score\_Below\_80 in dictionary  
## Missing Opp\_Score\_Below\_80 in dictionary

#Creates a dataframe called team\_ranking\_2018 with rank data for all NBA teams in the 2018 season  
team\_ranking\_2018 = teams\_rankings(seasons = 2018, nest\_data = F, return\_message = T)

## Getting 2017-18 team rankings

#variables\_keep has the names of the columns from the two dataframes that are kept in the new dataframe called percent\_win\_rank. percent\_win\_rank is a dataframe that was created using left\_join by the nameTeam variable.  
variables\_keep = c("nameTeam", "pctWinTeam", "ptsPerGameRank", "nameDivison")  
standing\_rank\_comb = left\_join(season\_standing\_2018, team\_ranking\_2018, by = "nameTeam")  
percent\_win\_rank = standing\_rank\_comb[variables\_keep]  
  
#Took out the LA Clippers because data was not recorded for that team in 2018.   
percent\_win\_rank = percent\_win\_rank[-13,]  
  
#win\_minutes\_plot is the name of my scatterplot that graphs the percent of wins each team had and then the rank of the average number of points each team scored.   
win\_minutes\_plot = ggplot(percent\_win\_rank, aes(y = nameTeam), group = "nameDivison") +  
 geom\_point(aes(x = ptsPerGameRank, size = pctWinTeam, color = nameDivison), stat = "identity") +  
 ggtitle("NBA Teams and Rank for Points Scored") +  
 xlab("Points per Game Rank") +  
 ylab("Team Name") +  
 labs(size = "Percentage of Wins", color = "Division Name")  
win\_minutes\_plot



## NBA Teams Findings

This scatterplot shows every NBA team on the y-axis and their rank of the average number of points scored in a game. The points on the graph vary in size, by the percentage of games each team won in the 2018 season, and the color of the points are determined by the division that the team plays in. It makes sense to see that the larger sized points are at a lower rank for average number of points scored. That means that teams that have a lower rank generally win more games. There is also a trend in the green points, which represents the Northwest region, where most of those points are larger, so they win more games in the season, and they have a lower to middle rank. The San Antonio Spurs are an interesting team because they have a large percentage of wins, around 50%, but their rank for average points scored is about 27 out of 30, showing that they could be an outlier in this dataset.