Baseball Project

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For this project we cleaned the dataset Teams by filtering it through dplyr. We filtered the new dataset, "data", to show from year 2000 to 2016 and the five teams, which are Boston Red Socks, Cleveland Indians, Atlanta Braves, New York Yankees, and Chicago Cubs. We then added columns to the dataset to calculate the On-Base plus Slugging, OPS, and Batting Average on Balls in Play, BABIP, values for each team for each year.

```
if (!require('Lahman'))
{
  install.packages('Lahman');
  library(Lahman);
}
```

```
## Loading required package: Lahman
```

```
# install.packages(Lahman)
# library(Lahman)
library(dplyr)
```

```
##
## Attaching package: 'dplyr'
```

```
## The following objects are masked from 'package:stats':
##
##     filter, lag
```

```
## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```
library(gapminder)
library(ggplot2)
data <- Teams %>% filter (yearID > 1999, franchID %in% c("BOS", "CLE", "ATL", "NYY", "CHC"))

# View(data)
attach(data)

TB <- (H + X2B + (2*X3B) + (3*HR))
data$OPS <-  ((TB/AB) + ((H + BB + HBP) / (AB + BB + SF + HBP)))
data$BABIP <- ((H- HR) / (AB - SO - HR + SF))

ggplot(data, aes(x = yearID, y = OPS, color = franchID)) + geom_line()
```

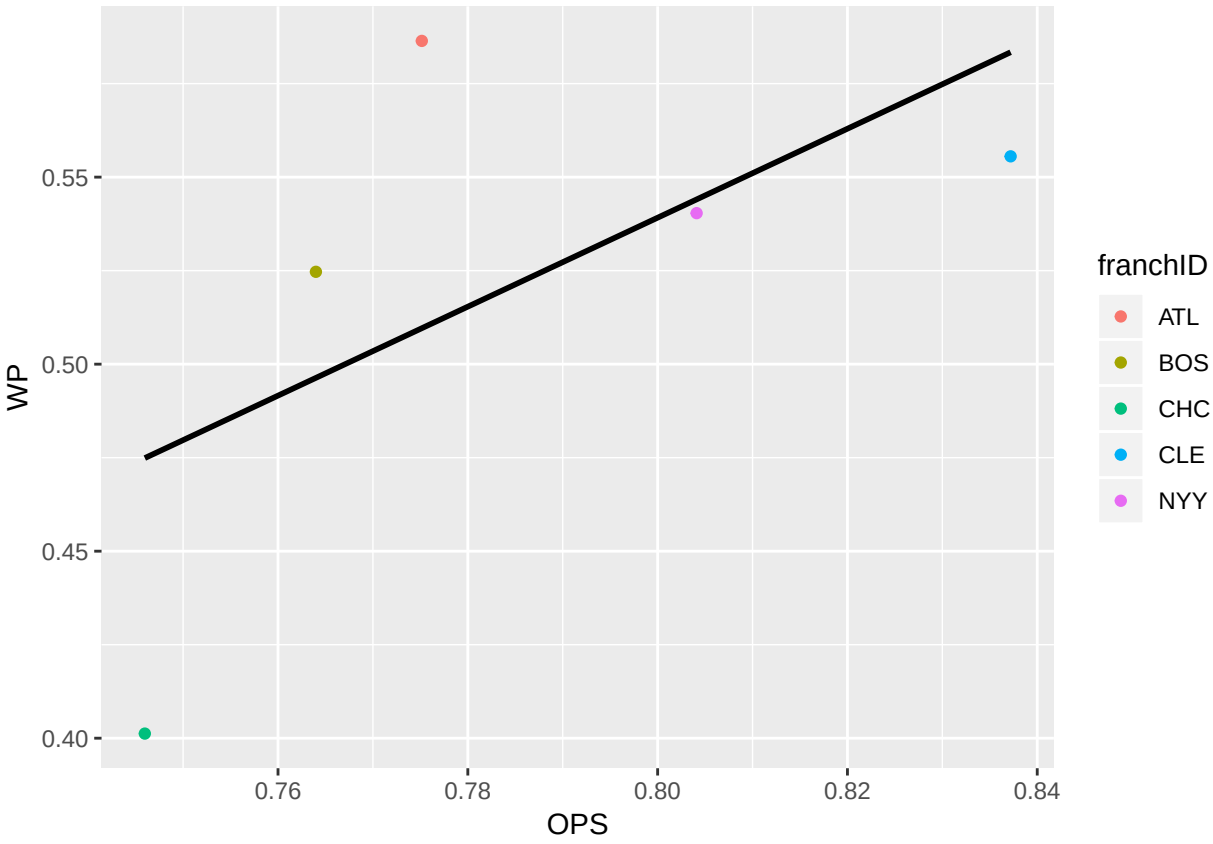
The time series graph above is showing the OPS of each of the teams from 2000 through 2016. During this time frame all these teams are inconsistent since their time series oscillate. The biggest thing we noticed is that around 2013 all of the teams dropped.

```
ggplot(data, aes(x = yearID, y = BABIP, color = franchID)) + geom_line()
```

The time series graph above is showing the BABIP of each of the teams from 2000 through 2016. This is showing that the Boston Red Socks have the most consistent BABIP of the teams, as well as the highest peak. The Cleveland Indians have an inconsistent and oscilating time series.

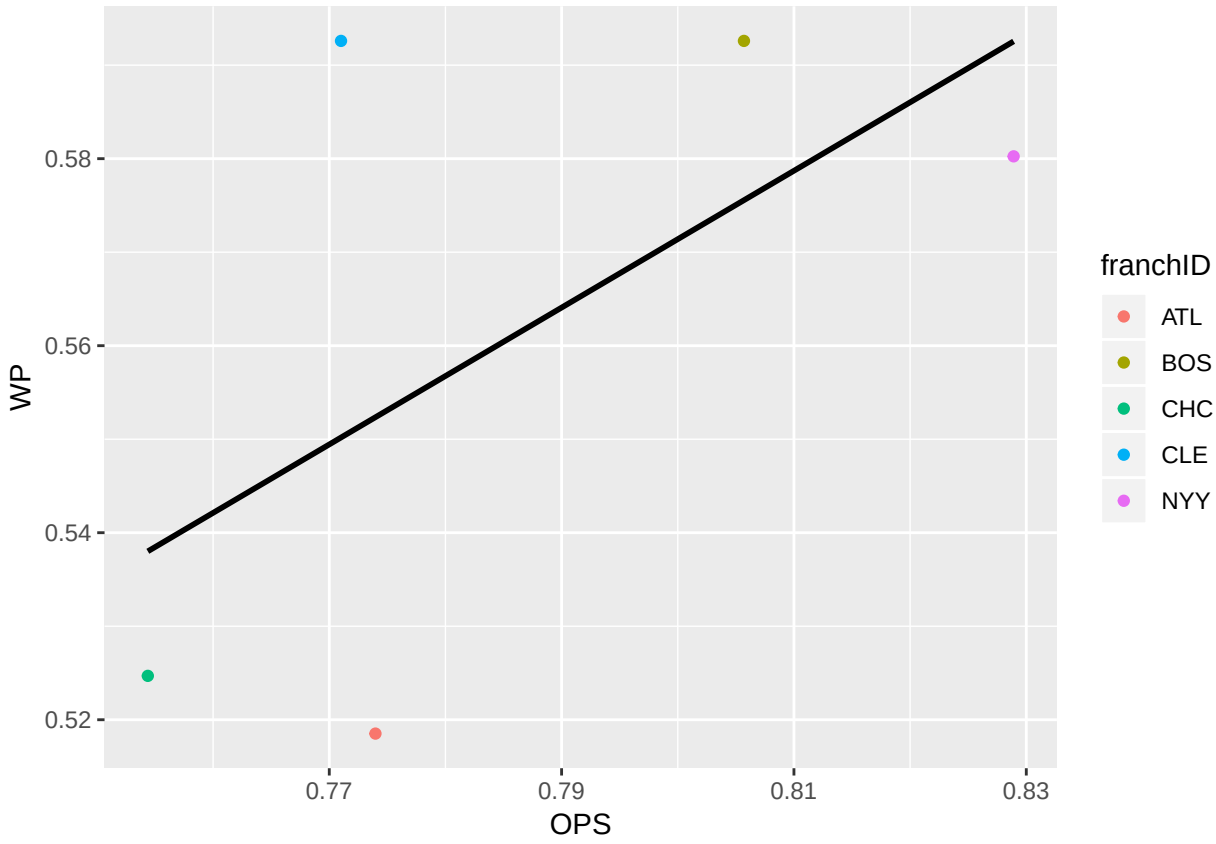
The scatter plots below compare OPS and BABIP to Winning Percentage (WP) for different years in order to determine how important hitting is.

```
data$WP <- (W / G)
new <- data %>% filter(yearID == 2000)
ggplot(new, aes(x = OPS, y = WP, color = franchID)) + geom_point() + geom_smooth(method = "lm", colour =
```



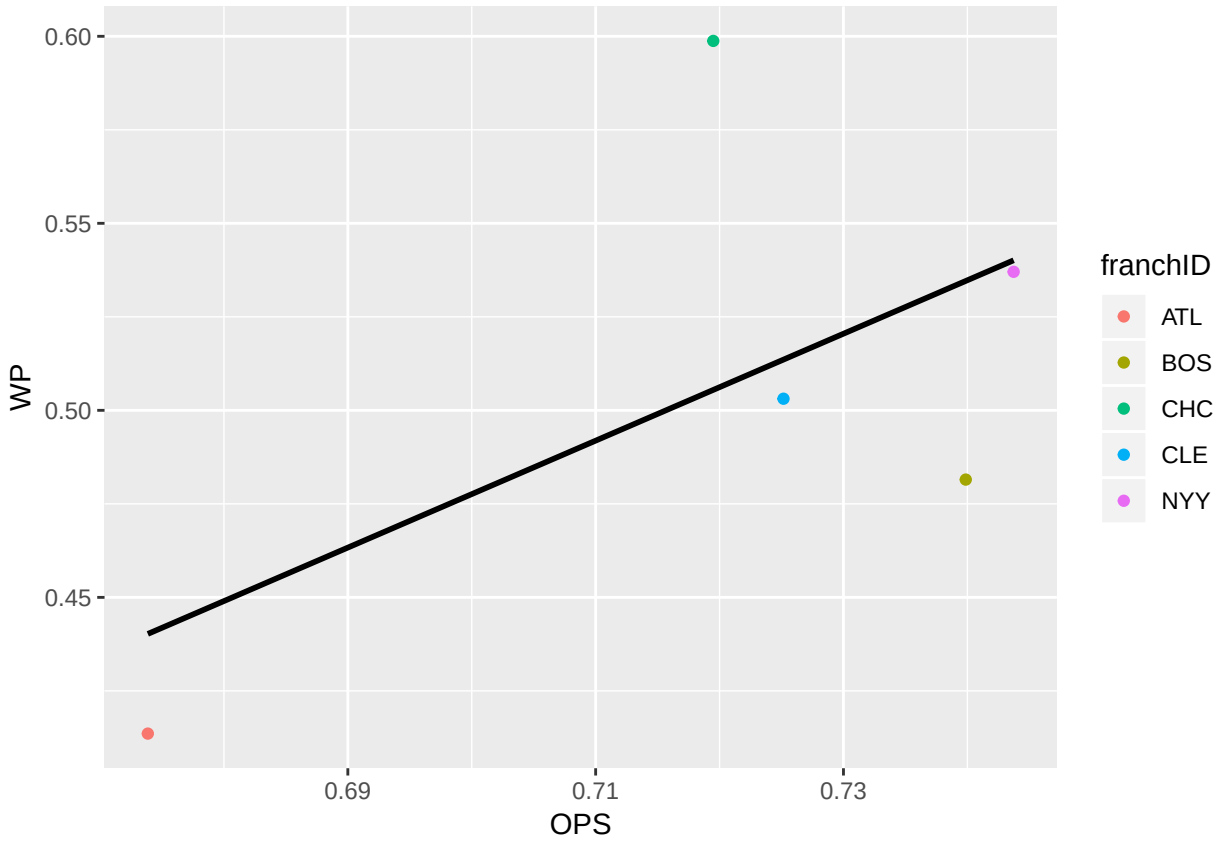
The scatter plots above is showing the OPS and WP for every team in year 2000. The teams OPS and WP plots are all relatively consistent with one another. The linear regression seems to fit well with the plotted teams.

```
new2 <- data %>% filter(yearID == 2007)
ggplot(new2, aes(x = OPS, y = WP, color = franchID)) + geom_point() + geom_smooth(method = "lm", colour
```



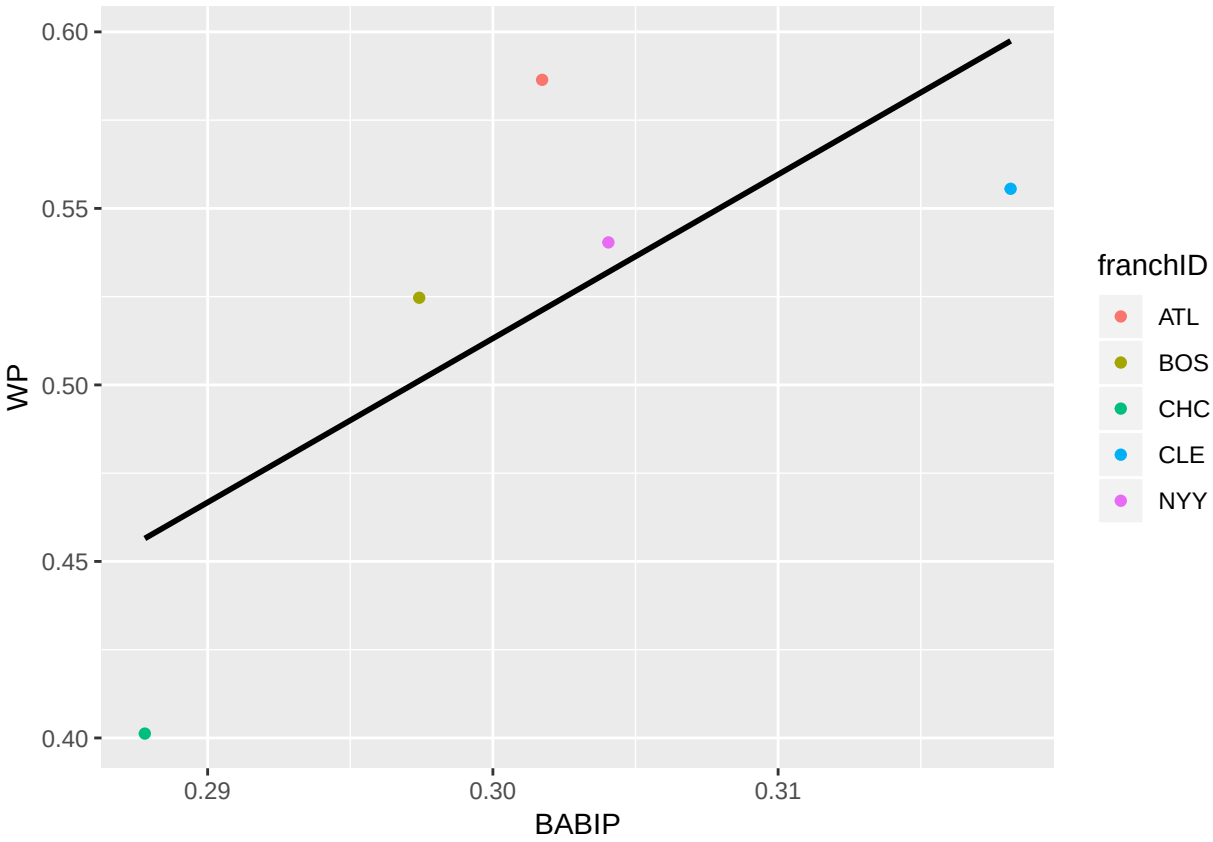
The scatter plots above is showing the OPS and WP for every team in year 2007. Eventhough the teams plots do not appear to be very consistent this gave us the highest linear regression. This most likely yeilds that 2007 was the best year for hitting on average for all the teams combined.

```
new3 <- data %>% filter(yearID == 2015)
ggplot(new3, aes(x = OPS, y = WP, color = franchID)) + geom_point() + geom_smooth(method = "lm", colour
```



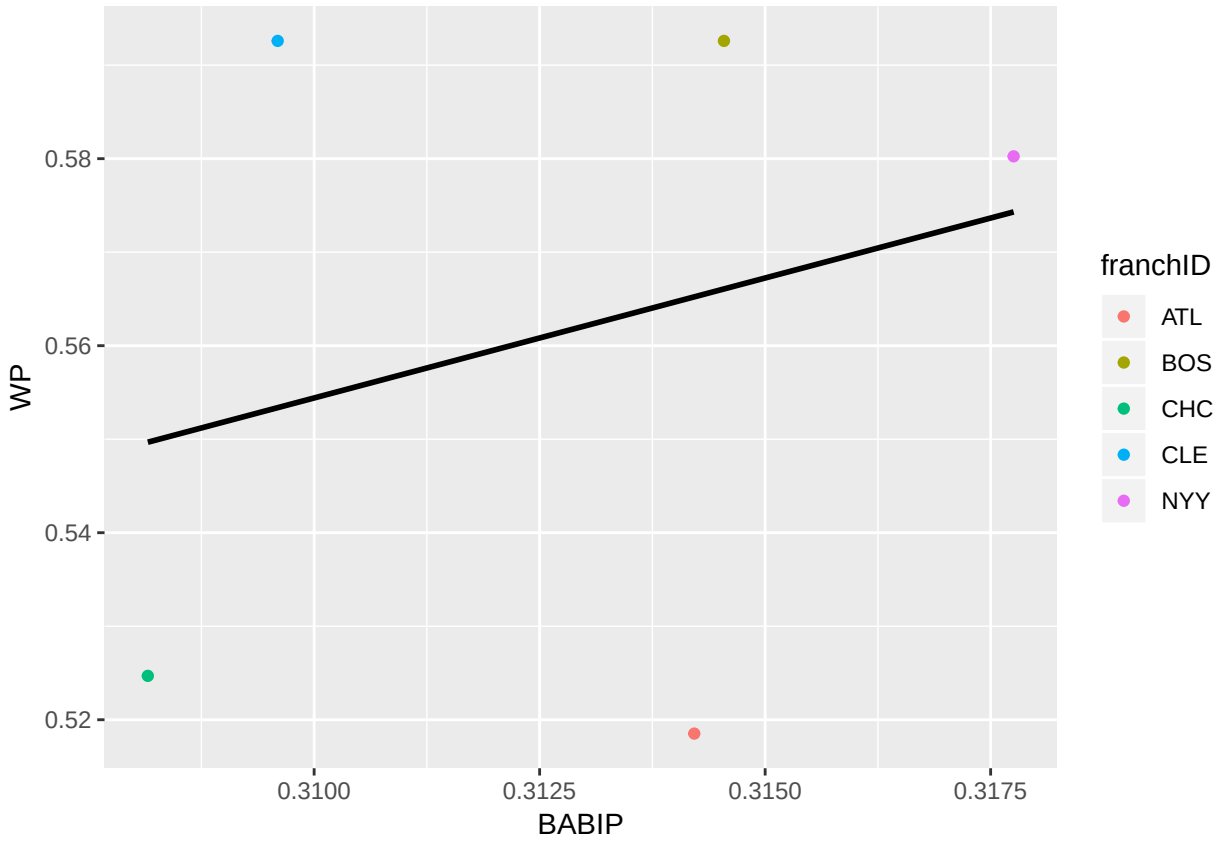
The scatter plots above is showing the OPS and WP for every team in year 2015. This graph shows the teams plots are scattered, therefore the linear regression line was probably hard to fit.

```
new4 <- data %>% filter(yearID == 2000)
ggplot(new4, aes(x = BABIP, y = WP, color = franchID)) + geom_point() + geom_smooth(method = "lm", colou
```



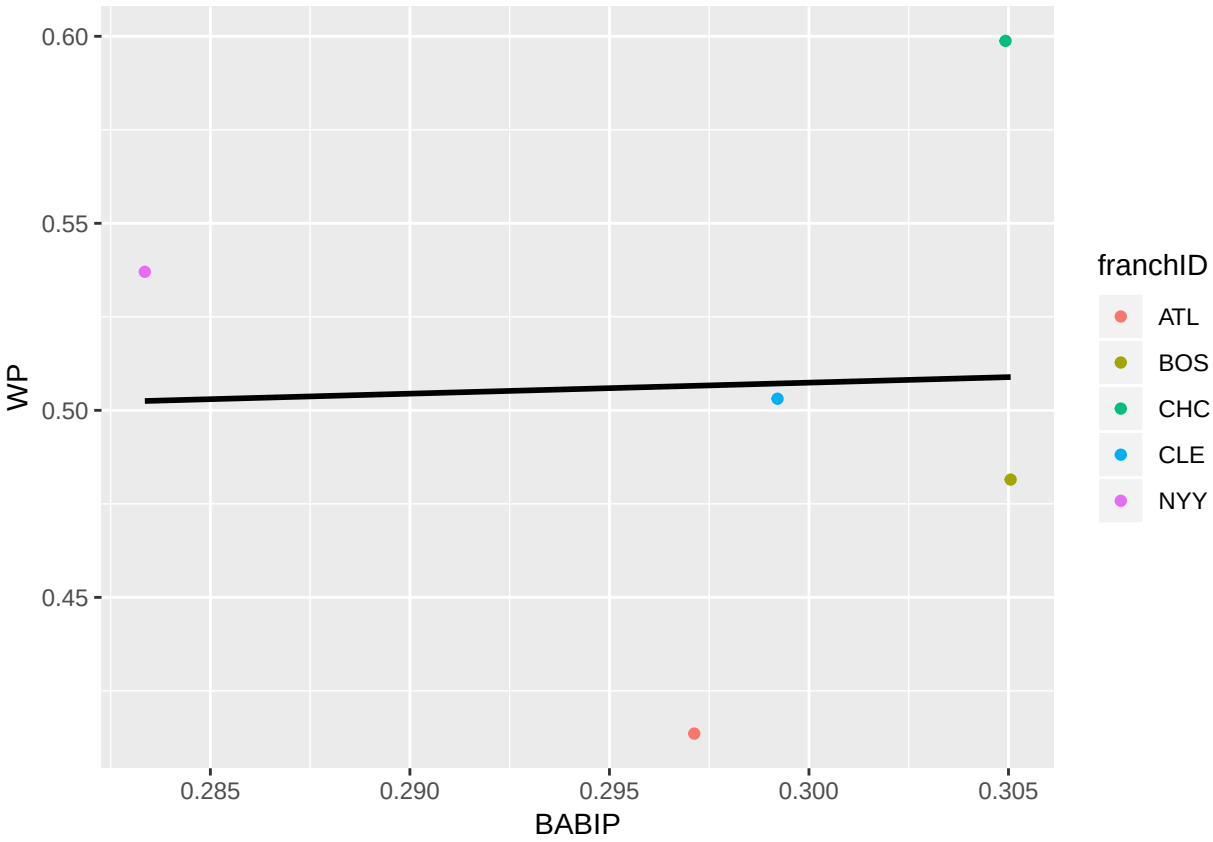
The scatter plots above is showing the BABIP and WP for every team in year 2000. The teams plots are relatively consistent, therefore yields a meaningful linear regression.

```
new5 <- data %>% filter(yearID == 2007)
ggplot(new5, aes(x = BABIP, y = WP, color = franchID)) + geom_point() + geom_smooth(method = "lm", colou
```



The scatter plots above is showing the BABIP and WP for every team in year 2007. The teams plare scattered and extremely inconsistent, therefore the linear regression does not correlate well with the teams.

```
new6 <- data %>% filter(yearID == 2015)
ggplot(new6, aes(x = BABIP, y = WP, color = franchID)) + geom_point() + geom_smooth(method = "lm", colou
```



The scatter plots above is showing the BABIP and WP for every team in year 2015. Although the teams are very scattered the linear regression is extremely linear.

Overall, OPS is a better indicator than BABIP of WP. OPS is a good indicator of WP since teams with higher WP typically have higher OPS. However, there are some teams who had higher OPS values that gave lower WP values. BABIP is also a good indicator of WP except it has more inconsistencies. Therefore these scatter plots are showing that hitting is important, but is not the only factor in WP.