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Final Project Part I

Seasonal Batter Ratting (SBR)

It can be argued that hitting a baseball is one of the hardest things to do in sports. Swinging the bat at the ball is more than just a simple reflex; rather, it involves player's smart decision making, and great control of their body movement to produce enough momentum so as to create a powerful whip action to launch the ball into the stands for a home-run. You might know some of the legendary batters who have mastered the art of batting such as Barry Bonds, Willie Mays, or Babe Ruth, but how efficient were these batters compared to the rest of their career years they've had? In fact, you could go even further and ask how efficient were these players at batting per season compared their career as a whole? This is exactly the statistic that I aim to describe for my final project, which I've labeled as **Seasonal Batter Rating** (**SBR**), the ratio involving numerous batting statistics in one season for a player over their career averages for those specific statistics. I believe that this ratio measures a player's efficiency in a given year compared to their career as a whole, so it can be noted if a player is performing better than they usually do or worse. In addition, I believe SBR can be used to find trends for batters' contribution to their team and see if a pattern exists to predict players future success. The formula is as follows:

$$\frac{BA_{Season} + wOBA_{Season} + wRC+_{Season}}{BA_{Career} + wOBA_{Career} + wRC+_{Career}}$$

These are the three baseball statistics I've specifically focused on when determining this ratio because:

(1) *Batting Average* looks at a common, but important statistic for batters, which is a batter's average performance as a ratio of their hits to the number of times they were at bat. *BA* is involved in the calculation because it is so prominent in baseball as one of the most famous statistics in sports, but note that it **NOT** useful as a statistic of its own.
(2) *woBA* represents a players *weighted on-base average*, which is involved in my statistic because it determines how valuable each offensive outcome for a given state truly is. The downside is that it doesn't account for how baseball's play style evolves over the years, which is why *wRC+* is also involved in the calculation.
(3) *wRC+* is *weighted runs created plus*, a statistic that involves park factor and league adjustments in its calculation. This statistic is involved in *SBR*'s calculation because it solves the issue that *wOBA* doesn't highlight, which is the park and league adjustments.

The data I plan to use will involve multiple player's batting statistics over the years, but one thing I also will factor is that it will be more beneficial to review a players SBR when they have a large # of plate appearances (PA), opposed to measuring a players SBR when they only had a couple PAs. In addition, I intend on presenting the data in two formats:

(1) Pandas dataframe, which will show batters SBR over several years (at least 3)
(2) Graph displaying players SBR over the years, which will indicate whether a player is improving, declining, or inconclusive.