**Title:** Exploring Baseball Adages Through the Lens of Modern Baseball Statistics and Statcast Data

**Project Overview:**

I've been a die-hard Mets fan since the day I was born. Or at the very least from the time I could speak. My parents like to remind me that one of my first sentences as a child was “Et go Met” (Let's Go Mets).

While their on-field performance has had its ups and downs, Mets fans have been spoiled for decades with one of the top broadcast booths in the league. When they play in a nationally televised game, I find myself missing the comforting voices and interesting analysis of Gary, Keith, and Ron. I also find myself shaking my head in disbelief at some of the things I hear from the national broadcast booths.

During one game, the national booth was lamenting about the importance of having clutch hitters on your team. The entire time, I was thinking back to the analysis I've read on Fangraphs and Baseball-Reference over the years about the fact that previous clutch performance isn't predictive of future clutch performance.

**The Problem:**

I started wondering if I could use modern baseball statistics and Statcast data to test the validity of this and other baseball adages. Specifically, I wanted to look at the following:

* Does clutch performance result in more team wins over the course of a season?
* Do teams that perform well in clutch opportunities during the regular season go deeper in the playoffs?
* Do players really hit peak performance in their late twenties?
* Do the “three true outcomes” hold up when viewed through the lens of modern data?

I set out to answer these questions and build a dashboard to visualize the results.

**The Data:**

My research quickly led me to **pybaseball**, a powerful Python module designed to scrape data directly from Baseball Savant and other key sources.

I dove into the documentation for the module to learn its functionality, then wrote a script to extract the specific data I needed. I pulled both individual player statistics and aggregated team statistics to conduct a comprehensive mixed-level analysis. For individual players, I limited the results to those with over 50 innings pitched (for pitchers) or 200 plate appearances (for batters) to ensure a statistically significant sample size for performance evaluations. I utilized the **Pandas** library to export the processed data to CSV files.

Once extracted, the data needed extensive cleaning before I could utilize it in my analysis and dashboard. This process included:

1. **Removing unnecessary columns.** The dataset included way more columns than I would need for my current analysis. I systematically reviewed each column to determine whether there was a chance I could use it. If I wasn’t going to use it, I removed it from the dataset to reduce the overall size of the dataset and increase efficiency.
2. **Addressing null values.** Of the remaining columns, I examined whether there were any null values that would impact my analysis. For each null value, I analyzed the potential impact and then either deleted the row or imputed a value.

For this project, I focused exclusively on data from the most recently completed season (2024). This approach provides the most current snapshot of how these adages hold up against contemporary statistics and tracking technology. While multi-season analysis offers longitudinal insights, not every piece of Statcast data or modern statistics are available for previous seasons. Additionally, a single recent season provided a robust sample for this exploratory analysis.

After exploring various methodologies to test my questions, I settled on the following approaches:

1. **Clutch:** Comparing Fangraph’s “Clutch” stat with team wins. Fangraph’s Clutch stat “measures how much better or worse a player does in high leverage situations than he would have done in a context neutral environment”.
2. **Prime Age:** Since we are looking at a single season, we can’t compare individual player’s performance over time. Instead, I’ve broken hitters into six age buckets (early 20s, mid 20s, late 20s, early 30s, mid 30s, and late 30s). To avoid skewing results due to varying player counts across the age groups,I looked exclusively at the top 10% of players within each group (based on xWOBA).
3. **Three true outcomes:** The “three true outcomes” in baseball are strikeouts, walks, and homeruns. This is because none of these outcomes involve the defense other than pitcher and catcher. However, there are other factors outside the control of the pitcher or batter (e.g. umpire errors, stadium dimensions, and weather conditions). To test how “true” these outcomes are, I used the advanced statistics of Stuff+, Location+, and Barrel% compared them with traditional statistics of K%, BB%, and HR/AB respectively.

**Key Insights:**

* **Clutch**: Having clutch batters on your team has no impact on your ability to win games during the regular season or playoff success. Notably, the two teams that made it to the World Series (Dodgers and Yankees) had a negative average clutch among their batters.
* **Prime age**: Players in their early 30s performed the best! There was very little difference in results among the three “20s” age groups and even the mid-30s group showed a minimal drop-off. A significant drop-off wasn’t observed until the late-30s.
* **Three true outcomes**: These tend to hold up as mostly true! There is a high correlation between the advanced statistics and the actual results. However, it is still worth examining the outliers in the data. There were several players that had well above average Stuff+ or Location+, but performed poorly in terms of K% or BB%.

**Recommendations:**

As is often the case with adages, the wisdom of these baseball adages appears to be lost in modern context. Based on my analysis of the 2024 data, I would recommend that baseball teams consider the following:

* **Prioritize Consistent Performance over "Clutch"**: I would place very little weight on a player's "clutch" performance when evaluating potential free agents or trade targets. Instead, focus on consistent success across all game situations.
* **Re-evaluate Long-Term Deals for Players in Their 30s**: Teams should be more willing to sign players who have reached their 30s to long-term deals. Current hesitancy to sign anyone but superstars well into their 30s likely causes teams to miss out on significant value.
* **Hunt for "Three True Outcome" Outliers**: Be willing to delve deeper when evaluating players based solely on their traditional "three true outcome" results. Players like Tim Hill, who had one of the worst K% in the league but was well above average in Stuff+, represent potential undervalued assets if other teams are focusing solely on results.

I also recommend that teams explore future analysis projects to analyze these and other adages in more depth. In particular, I would suggest an in-depth multi-season analysis, and a willingness to always question conventional wisdom with data.