What is BUP/PUP?

BUP/PUP - short for Batting/Pitching Under Pressure - is a statistic that attempts to capture a player's 'clutchness'. If such a thing exist, a player would no doubt raise his performance when the game's outcome is in question. We will define a batter's BUP_{BA} as the following.

$$BUP_{BA} = 100 * (BA_{clutch} - BA_{regular})$$

We can see that a player's BUP/PUP can be calculated for any baseball statistic that is currently available.

A Note About Scale

Because PUP can be calculated for any statistic, the original statistics scale should be considered when evaluating a player's PUP. For example, if player A's batting average drops from .330 to .300 during clutch situations, his corresponding BUP_{BA} will be -30. That is, his BA drops 30 percentage points in clutch situations. Knowing what we know about batting average, this is a dramatic change. However, a -30 change in OPS may not be as dramatic since the scale of OPS is much different. So remember, use common sense when using PUP.

What is a Clutch Situation?

For our purposes, we will consider a clutch situation to be any at-bat in the $7th$ inning or later in which the lead can change. Thus, a tie ball game with no runners on base will be considered a clutch situation in our calculations. A non-clutch situation is any at-bat

that is not in the set of clutch plays. One may recognize the set of clutch plays as at-bats with particularly high leverage scores.

Why Use BUP/PUP?

PUP is simple. Because PUP uses already known statistics, any reader who is sufficiently fluent in baseball statistics will be able to easily understand what a player's PUP means. Moreover, a reader may apply the PUP formula to any statistic they wish. With the current, varied and divisive opinions about current baseball statistics, the author feels this a net positive.

PUP makes intuitive sense. Clutch players are supposed to elevate their game when it matters most. PUP is designed to capture exactly this idea. Because the sample sizes in all datasets used are relatively large, PUP will be able to capture even minor fluctuations in a player's performance.

Because PUP can be calculated for every stat, PUP can also be used to measure the 'clutchness' of pitchers and batters. This is in contrast to 'Clutch' of fangraphs which is only used for batters. With this in mind, we can make complete evaluations about entire rosters using the PUP statistic.

A Comparison with Clutch(Fangraphs)

One comparable stat for measuring a player's performance is the Clutch stat from frangraphs. Clutch is defined in the following:

$$Clutch = \frac{WPA}{pLI} - \frac{WPA}{LI} : where\ WPA\ is\ the\ win\ prob.\ added\ and\ (p)LI\ is\ the\ leverage\ of\ the\ situation$$

Clutch is one of the most respected statistics around and is the standard that PUP wishes to attain. To see how it stacks up against Clutch, consider the undisputed best player in baseball Mike Trout. In 2018, Mike Trout attained the following statistics.

Statistic:	Clutch	BUP(BA)	BUP(wOBA)	BUP(SLG)
Mike Trout	-2.3	-20.8	-26.4	-42.9

Anything below -2.0 is considered 'awful' by clutch standards. Likewise, a drop of 20.8, 26.4 *and* 42.9 percentage points in batting average, wOBA and slugging is considered 'terrible' by BUP standards. The takeaway, Mike Trout may not be the greatest player to ever live and BUP works!

Go Forth and Multiply!(your PUP scores)

Now that you are familiar with PUP, feel free to use the corresponding JUPYTER notebook for all your baseball needs!