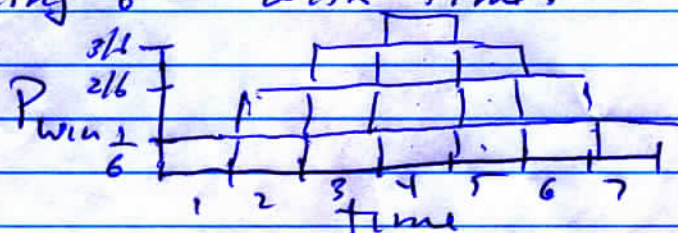A gaming table is unfair. A magnet changes the probability of a die rolling a "winning 6" with time.

A person rolls a win. What is the best estimate of the time the dice was rolled. Obviously at the time of maximum probability, $t = 4$.

This is an application of the principle of max. Likelihood.

But what is certainty of the estimate? Suppose I were to have had 6 rolls per time interval. The wins would be $1 - 2 - 3 - 4 - 3 - 2 - 1$, 16 wins, but only 4, or 25% are in the $t=4$ interval. $\frac{10}{16} = 62.5\%$ are in intervals 3-5.

Note that I am using here $P_{win}(t)$ as if it were a distribution for t (whereas it is actually a distribution for wins)

By this argument I can use the max likelihood fcn for a parameter as the dist for that parameter