California Institute of Technology
Department of Electrical Engineering

EE 162
Random Processes for Communication and Signal Processing

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3. *The Underdog and the World Series*

The World Series is, as a first and crude approximation, a Bernoulli sequence of trials. Each trial is, of course, the playing of an individual game. Suppose the stronger team has probability p ($> 1/2$, of course) of winning any particular game. What is $P(p)$, the probability that the weaker team wins the series? (For those who don't follow baseball, the modern World Series is a best-of-seven competition; i.e, the first team to win four games wins the series.) In addition, find an expression for $D(p)$, the average duration (in games) of the World Series as a function of p, and use the following actual historical data to estimate p (this is very crude, as it assumes p has been constant for nearly a century, but this is for fun).

Duration of World Series	Number of Times
4 games	17
5 games	20
6 games	21
7 games	33

Table 1: Historical Data

Hint: The team that wins the Series wins the last game played.