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A Mathematical Modelling Approach to One-Day Cricket Batting Orders

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ABSTRACT

While scoring strategies and player performance in cricket have been studied, there has been little published work about the influence of batting order with respect to One-Day cricket. We apply a mathematical modelling approach to compute efficiently the expected performance (runs distribution) of a cricket batting order in an innings. Among other applications, our method enables one to solve for the probability of one team beating another or to find the optimal batting order for a set of 11 players. The influence of defence and bowling ability can be taken into account in a straightforward manner. In this presentation, we outline how we develop our Markov Chain approach to studying the progress of runs for a batting order of non- identical players along the lines of work in baseball modelling by Bukiet et al., 1997. We describe the issues that arise in applying such methods to cricket, discuss ideas for addressing these difficulties and note limitations on modelling batting order for One-Day cricket. By performing our analysis on a selected subset of the possible batting orders, we apply the model to quantify the influence of batting order in a game of One Day cricket using available real-world data for current players.

Key words: One-day cricket, batting orders, mathematical modelling

Key Points

- Batting order does effect the expected runs distribution in one-day cricket.
- One-day cricket has fewer data points than baseball, thus extreme values have greater effect on estimated probabilities.
- Dismissals rare and probabilities very small by comparison to baseball.
- Probability distribution for lower order batsmen is potentially skewed due to increased risk taking.
- Full enumeration of all possible line-ups is impractical using a single average computer.

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