
Lab 10 : Optimal “First Batting” Strategy

We want to find the optimal strategy employed by a team batting first. The assumptions are stated as follows:

- At any point of time only 1 batsmen is playing.
- Let (b, w) denote the state, where b is the balls left, and w is the wickets left.
- There are 5 possible shots, i.e., trying to score $A = \{1, 2, 3, 4, 6\}$. These shots are associated with the risk of getting out, and it varies from batsmen to batsmen. The top batsman $w = 1$ has the following probabilities of getting out $p_{\min}^{\text{out}} = \{0.01, 0.02, 0.03, 0.1, 0.3\}$, where the i^{th} entry is for the i^{th} action. The last batsman (i.e., $w = 10$ pair) has the following probabilities of getting out $p_{\max}^{\text{out}} = \{0.1, 0.2, 0.3, 0.5, 0.7\}$. If there are w wickets in hand, then use the formula $p^{\text{out}}(w, a) = p_{\max}^{\text{out}}(a) + (p_{\min}^{\text{out}}(a) - p_{\max}^{\text{out}}(a)) \times ((w - 1)/9)$

Compute the `Best-Score(b, w)` and `Best-Shot(b, w)`, for all $b = 1, \dots, 300$ and $w = 0, 1, \dots, 10$.