Artificial Intelligence : Optimal “First Batting" Strategy

chandru@iitpkd.ac.in

We want to find the optimal strategy employed by a team batting first.

- At any point of time only 2 batsmen are playing. Let us consider them to be a single entity. Thus there are 10 batsmen in our model, i.e., $(1,2),(2,3),...(10,11)$
- 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 (remember this is the players $(1,2)$ put together) has the following probabilities of getting out $pw_{\min} = \{0.01, 0.02, 0.03, 0.1, 0.3\}$, where the i^th entry is for the i^th action. The last batsman (i.e., $(10,11)$ pair) has the following probabilities of getting out $pw_{\max} = \{0.1, 0.2, 0.3, 0.5, 0.7\}$. If there are x wickets in hand, then use the formula $pw = pw_{\max} + (pw_{\min} - pw_{\max}) \times ((x-1)/9)$
- When the batsman is not getting out, the probability of successfully obtaining the runs for that shot is given by $pr = pr_{\min} + (pr_{\max} - pr_{\min}) \times ((x-1)/9)$. Take $pr_{\min} = 0.5$, and $pr_{\max} = 0.8$.