

Optimalization of Blackjack Strategies with Reinforcement Learning

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Abstract

Blackjack is a widely recognized and immensely popular card game commonly played in casinos around the world. It does not only provide a source of entertainment but also a wide range of options for applying advanced computational techniques, especially in the field of machine learning. Among these, Reinforcement Learning stands out as a particularly compelling approach for tackling the challenges of the game.

In my thesis, I have explored the connection of Markov Decision Processes and Reinforcement Learning with blackjack. I have examined the mechanics of the game, including its rules, strategies and probabilistic elements, as well as the theoretical and practical foundations of Reinforcement Learning. By formulating blackjack as a Markov Decision Process, I have developed and analyzed algorithms that can effectively learn to play blackjack, potentially outperforming traditional rule-based or heuristic methods. Furthermore, I also implemented the game using a graphical interface to create a blackjack application to play with.

The task was implemented in Python.