

In this Thesis we deal with the log-optimal betting approach. The goal is to maximize the gambler's wealth in the long term. In the course of the Thesis, we will work our way from the basic cases to a completely general problem, while the task is always to obtain a log-optimal betting strategy. For the simplest cases, we use the connection to information theory, and for others we will formulate and prove a version of the Karush-Kuhn-Tucker conditions suitable precisely for the log-optimal betting approach. In this work, we focus primarily on the tree betting scheme and we will derive the algorithm for obtaining the log-optimal strategy of any betting opportunity from the tree betting scheme, which covers a large variety of betting opportunities. We will then use this algorithm to program an application in Python, which will print out the log-optimal strategy of a given betting opportunity to the user. Finally, we will verify that the obtained results correspond to the Kelly criterion and we will show several examples of the use of the Thesis.