

Comparative Test Report
Rock-Paper-Scissors Algorithms 3 and 4
30.11.2024

Background:

Based on peer feedback, I set out to create a secondary version (v4) of my complete algorithm (v3), to test out if the time and space complexity could be improved upon.

In v3, I prioritised time over space, and created an algorithm with minimal recursion, yet it uses five separate dictionaries to store the past moves. In v4 I prioritise space complexity over time, which results in code with less repetition, but a larger time complexity.

Tests done:

The algorithms were tested against human-players, as well as against a random number generator (see bottest.py) and the results show that the algorithms perform the exact same against human-opponents, as their logic is the exact same. See test.pdf for the results from human trials.

Against a random number generator with n number of rounds (n=1000, 10 000, 100 000):

v3 performed exceptionally well with average times of 0.0565 s, 0.322 s and 2.92 s.

v4 failed to replicate this performance with averages of 0.188 s, 1.89 s and 18.2 s.

What is notable however, is that v4 showcases linear increase, which went against my own assumption of it performing far worse with larger repeats.

Conclusions:

The v3 algorithm performed better on smaller datasets, however v4 appears to have a more stable increase. I will carry out further tests to evaluate whether or not this is true and what the limits of this are to find out which is the superior algorithm.

Note:

Since no-one is going to be playing 100 000 rounds of Rock-Paper-Scissors back to back, the v3 algorithm suffices as far as I am concerned.