Algorithms and automata for the Tower of Hanoi

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Mathematical solitaire games like the Chinese Rings and the Tower of Hanoi can be modelled by state graphs, leading to the two-parameter classes of Sierpiński graphs $S^n_p$ and Hanoi graphs $H^n_p$. Shortest path algorithms can be based on automata in the Sierpiński case, so that the metric properties of $S^n_p$ (and $H^3_3 \cong S^n_3$) are now completely understood. For Hanoi graphs with $p > 3$, however, the notorious Frame-Stewart Conjecture (1941) is still undecided and unexpected behavior of eccentricities like Korf’s Phenomenon (2004) remains unexplained. Whereas $\text{diam}(S^n_p) = 2^n - 1$ for all $p \geq 2$, the diameter of $H^n_p$ is known only for small values of the parameters by computer experiments.

References.


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