

Computational Experiments on Hanoi Graphs

Ciril Petr

Institute of Mathematics, Physics and Mechanics
Ljubljana, Slovenia

and

Faculty of Natural Sciences and Mathematics
University of Maribor, Slovenia

ciril.petr@gmail.com

Abstract

Generalizing the classical *Tower of Hanoi*, invented by É. Lucas in 1883, to more than three pegs gives us a highly nontrivial mathematical object worth to explore not only analytically but also experimentally. The first significant computing experiment was published in 1999 by J.-P. Bode and A. M. Hinz who confirmed the Frame-Stewart conjecture in the case of four pegs for up to and including 17 discs. In 2004 R. Korf extended these results and also found a surprising phenomenon for $n = 15$ discs in the corresponding *Hanoi graph* H_4^{15} . Even more surprising was that this *Korf phenomenon* did not occur for $n = 16$ to 19, but reappeared for $n = 20$ to 24. In 2014 we got access to supercomputing facilities where we managed to extend numerical results of several phenomena.