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Kate Lorenzen* (lorenkj@iastate.edu), **Jane Breen**, **Steve Butler**, **Nicklas Day**, **Colt DeArmond**, **Haoyang Qian** and **Jacob Riesen**. *Computing Kemeny's constant on barbell graphs.*

A graph is a set of nodes and edges connecting the nodes to one another. We can travel from one node to another by walking on the edges. The average time it takes to travel from one node to another for a particular graph is called Kemeny's constant. Kemeny's constant can be computed by representing the graph structure by a matrix and calculating the eigenvalues. For highly structured graphs such as the barbell graph, we find an explicit expression of Kemeny's constant and use it to prove the conjecture that the balanced barbell graph has highest order Kemeny's constant among barbell graphs. (Received August 28, 2019)