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Kemeny's constant and random walks on graphs

Kemeny's constant is an interesting and useful quantifier of how well-connected the states of a Markov chain are, and is calculated using the eigenvalues of the transition matrix. By considering the random walk on a simple, undirected graph, and the eigenvalues of the normalized Laplacian matrix of the graph, we can compute Kemeny's constant and regard this value as a graph parameter with a concrete interpretation in terms of the expected length of a random trip in the graph. Kemeny's constant has also been used to inform strategies for stochastic surveillance in a graph. In this talk we give a survey of known results, consider extremal graphs where Kemeny's constant is largest possible, and present new techniques in spectral graph theory which facilitate the computation of Kemeny's constant for these graphs.