CS 0368-4246: Combinatorial Methods in Algorithms (Spring 2025)   May 19, 2025

Lecture 8: Introduction to Expander Graphs

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Homework Questions

1. Prove or disprove if the following properties we showed in class are equivalent to being a φ-expander (with respect to the conductance-based definition):

    (a) For every subset $D \subseteq E$ of edges, denote by $C_1, C_2, \ldots, C_r$ all connected components of $G - D$ with $vol(C_i) \leq vol(V)/2$. Then, $\sum_i vol(C_i) \leq O(|D|/\varphi)$.

    (b) The diameter of G is $O(\log n/\varphi)$.