

Practice Problems: Primal-Dual Method for Approximation Algorithm

February 7, 2024

1. Show that two vertices s and t are connected in a graph \mathcal{G} if and only if $\delta(S)$ is non-empty for every subset $S \subset V[\mathcal{G}]$ such that $|S \cap \{s, t\}| = 1$.
2. Show that the standard primal-dual method based algorithm for minimum cost set cover problem has an approximation factor of f where f is the maximum frequency of any item.
3. Design a primal-dual method based approximation algorithm for the minimum weight vertex cover problem.