

Assignment 5, CS 6382

due at the beginning of Lecture on 4/25

no late homework would be accepted

- 1 Show that the following is an APX-complete problems: Given a graph G with nonnegative edge weight and a subset P of vertices, compute a minimum edge-weight subtree T interconnecting vertices in P .
- 2 Show that the following problem is APX-complete: Given a collection \mathcal{C} of subsets of at most three elements in a finite set E , find a minimum set cover $\mathcal{C}' \subseteq \mathcal{C}$.
- 3 Construct a polynomial-time L -reduction from the following problem to KNAPSACK to show that the following is not an APX-complete problem unless $\text{NP}=\text{P}$: Given a finite set S of positive integers, find a subset S' to minimize $|\sum_{s \in S'} s - \sum_{s \in S-S'} s|$.
- 4 Exercise 11.23(a).
- 5 Exercise 11.23(b)
- 6 Show that the following problem has no polynomial-time approximation with performance ratio $o(\log n)$ unless $\text{NP}=\text{P}$: Given a graph $G = (V, E)$ with positive node weight, find a node subset C with minimum total weight such that every edge has an endpoint in C and the subgraph induced by C is connected.