Approximation Algorithms - Homework 2

Ilay Menahem, and Aaron Ross

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Problem 1: Weighted Max-Cut Local Search

(a) Polynomial Convergence

Overview

Proof of Validity

Complexity Analysis

(b) Improved Bound with Specific Initialization

Algorithm Modification

Complexity Analysis

Problem 2: Hitting Set

Algorithm: Recursive Local Ratio

Approximation Analysis

Problem 3: Multiple Choice Maximum Coverage

Problem 4: Generalized Steiner Forest (GSF)

(a) Minimal GSF is a 2-approximation for w'

(b) Local Ratio Algorithm

Problem 5: Knapsack with Partition Constraints

Overview

Dynamic Programming

FPTAS Construction

Complexity and Bound