

CONCORDIA UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND SOFTWARE ENGINEERING
COMP 6651: Algorithm Design Techniques
Winter 2017
Quiz # 3

First Name	Last Name	ID#
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Question 1

Establish a recursive formula that relates the optimal solution of a large problem to optimal solutions of smaller subproblems. What is the complexity for computing an optimal solution?

Balance Partition. You have a set of n integers each in the range $0, 1, \dots, K$. Partition these integers into two subsets such that you minimize $|S_1 - S_2|$, where S_1 and S_2 denote the sums of the elements in each of the two subsets.

Recursive Formula

Complexity

Question 2

Design a greedy algorithm that solves exactly the following problem for matching skiers and skis.

A skier of height h with a pair de skis of length ℓ has a discrepancy of $|h - \ell|$.

Input: A set of n skiers of heights h_1, h_2, \dots, h_n and a set of skis of lengths $\ell_1, \ell_2, \dots, \ell_n$.

Output: A matching between the n pairs of skis and the n skiers that minimizes the maximum discrepancy.

Description of the Greedy Algorithm

Complexity of the Greedy Algorithm

Proof that the Greedy Algorithm outputs an optimal solution