

Homework #9

You should try to solve these problems by yourself. I recommend that you start early and get help in office hours if needed. If you find it helpful to discuss problems with other students, go for it. **The goal is to be ready for the in class quiz that will cover the same or similar problems.**

Problem 1: Summing Integers

Suppose you are given a collection $A = \{a_1, a_2, \dots, a_n\}$ of n positive integers that add up to $2Z$. Design an $O(nZ)$ time algorithm to decide if the set can be partitioned into two groups B and $A - B$ such that:

$$\sum_{a_i \in B} a_j = \sum_{a_i \in (A-B)} a_i = Z$$

Problem 2: Constrained Moving on a Grid

Write the dynamic programming recursive definition and base case to calculate the number of different paths on a coordinate grid from $(0,0)$ to (n,m) if you are only allowed to go right or upwards on the grid. Then, write down the runtime of implementing the dynamic programming algorithm in terms of n and m .