

Activity Sheet 11

Manager name:

Recorder name:

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Section 6.1

1. Suppose we have two integer arrays A and B of size n and m respectively.
 - a. Design a presorting-based algorithm to find out if the two sets have an integer in common.
 - b. Compute the running time of the algorithm in terms of the problem size $n+m$ (or you can use as a measure of size the largest of the two).

2. We will now use the previous algorithm to solve the following problem: Given an array A of distinct numbers and a target number s , determine if s is the sum of two numbers from A . The idea for the solution is that if x is one of the numbers, then $s - x$ is the other.
- Write an algorithm that solves the problem as follows: We first create an array B that contains all the values $s - x$ for each value x in A . We then use problem 1 to find a number that belongs to both A and B . This number is the solution to our problem.
 - Demonstrate the operation of this algorithm for the array with entries 23, 4, 16, 7, 12, 32, and target value $s = 39$ as well as target value $s = 8$ (You should notice an important detail regarding your algorithm for this second value).
 - What is the running time for this algorithm? How does it compare to the brute-force approach of trying all possible pairs?