CSC 225: Lab 7

PairSum225 algorithm

You are to design and implement an algorithm for the PairSum225 problem. The problem is defined as follows:

Input: An array A of n non-negative integers.

Output: A boolean value ($true$ or $false$). If there are two indices i and j such that $0 \leq i, j \leq n-1$ and $A[i] + A[j] = 225$, the output will be $true$. If no such indices exist, the output will be $false$.

There are three approaches to solving this problem:

1. The brute-force algorithm can be done in-place where you check every pair of values, $A[i] + A[j]$. This algorithm is $O(n^2)$.

2. You can choose to sort the array, then scan from left and right through the array at the same time looking for $A[i] + A[j] = 225$. This algorithm is $O(n \log n)$ provided the sort algorithm is $O(n \log n)$.

3. Finally, you can solve this problem in $O(n)$ time by using a second array of length 226, (i.e. index range $[0,225]$).

You have been provided with six input test files, three with a pair sum of 225 and three without. Use them to test the correctness of your code.