For each of the functions below, give an algorithm for computing the function and analyze its running time. Any correct and correctly-analyzed algorithm will get substantial credit, but each of these problems have multiple possible solutions. The faster your algorithm, the more credit you will get for the problem.

1. SUM2(A, t) is a function that takes as input an array A of numbers and a target number t. The output should be a boolean equal to “true” if there are two (distinct) numbers in A whose sum is t and “false” otherwise.

2. BETWEEN(A, x, y) is a function that takes as input a sorted array of numbers A and two numbers x and y. The output should be equal to the number of numbers in A that are greater than x and less than y.

3. SORT(A) takes as input an array and sorts it. In this problem, you are allowed to assume that the elements of A are all integers, and that they are all between 1 and n^4, where n is the length of A.