

## Lab 12

### **Problem Description:**

Given a specified total  $t$  and a list of  $n$  integers, find number of distinct sums, using numbers from the list of  $n$  integers, that add up to the total  $t$ . For example, if  $t = 4$ ,  $n = 6$ , and the list is  $[4, 3, 2, 2, 1, 1]$ , then there are four different sums that equal 4: 4,  $3+1$ ,  $2+2$ , and  $2+1+1$ . (A number can be used within a sum as many times as it appears in the list, and a single number counts as a sum.) Your job is to solve this problem in general.

**Input:** The input contains three lines. The first line contains  $t$ , the total. The second line contains  $n$ , the number of integers in the list. The third line contains the list of  $n$  integers  $x_1, \dots, x_n$ .  $t$  will be a positive integer less than 1000,  $n$  will be an integer between 1 and 12 (inclusive), and  $x_1, \dots, x_n$  will be positive integers less than 100. The numbers  $x_1, \dots, x_n$  will be separated by exactly one space. Numbers in each list appear in non-increasing order, and there may be repetitions.

**Output:** The output will contain number of sums for each test case. A number may be repeated in the sum as many times as it was repeated in the original list. Within each test case, all sums must be distinct; the same sum cannot appear more than once.

Test Case	Input	Output
1	4 6 4 3 2 2 1 1	4
2	6 4 2 1 1 1	0
3	300 10 50 50 50 50 25 25 25 25 25 25	2