DWITE Online Computer Programming Contest
December 2005

Problem 5

HOW MANY SUMS

Given a specified total *t* and a list of *n* integers, find the 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.

The input file (**DATA51.txt** for the first submission and **DATA52.txt** for the second submission) will contain five sets of data. Each set will contain 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 $x_1,...,x_n$. *t* will be a positive integer less than 1000, *n* will be an integer between 1 and 12 (inclusive), and $x_1,...,x_n$ will be positive integers less than 100. The numbers $x_1,...,x_n$ will be separated by exactly one space. The numbers in each list appear in non-increasing order, and there may be repetitions.

The output file (**OUT51.txt** for the first submission and **OUT52.txt** for the second submission) , will contain, for each test case, the number of sums.

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 twice.

Sample Input (Only three cases given)

```
4
6
4 3 2 2 1 1
6
4
2 1 1 1
300
10
50 50 50 50 25 25 25 25 25 25
```

Sample Output

```
4
0
2
```