Summation of sequence of integers is always a common problem in Computer Science. Rather than computing blindly, some intelligent techniques make the task simpler. Here you have to find the summation of a sequence of integers. The sequence is an interesting one and it is the all possible permutations of a given set of digits. For example, if the digits are <1 2 3>, then six possible permutations are <123>, <132>, <213>, <231>, <312>, <321> and the sum of them is 1332.

Input

Each input set will start with a positive integer N ($1 \leq N \leq 12$). The next line will contain N decimal digits. Input will be terminated by $N = 0$. There will be at most 20000 test set.

Output

For each test set, there should be a one line output containing the summation. The value will fit in 64-bit unsigned integer.

Sample Input

```
3
1 2 3
3
1 1 2
0
```

Sample Output

```
1332
444
```