

Derangements HARD

A derangement of n numbers is a permutation of those numbers in which none of the numbers appears in its original place. For example, the numbers $\{1, 2, 3\}$ can be deranged into $\{2, 3, 1\}$ and $\{3, 1, 2\}$. We can modify this slightly for n numbers that are not necessarily distinct by saying that no number in the derangement can be in the place that a number of the same value was in in the original ordering. So the numbers $\{1, 1, 2, 2, 3\}$ could be deranged into $\{2, 2, 1, 3, 1\}$, $\{2, 2, 3, 1, 1\}$, $\{2, 3, 1, 1, 2\}$, and $\{3, 2, 1, 1, 2\}$.

Input

First line contains T ($1 \leq T \leq 100$) the number of test cases. Each test case contains two lines. First line contains an integer N ($1 \leq N \leq 15$) denoting total number of elements in the array. Second line contains a space separated list of N integers A_i such that $0 \leq A_i < N$.

Output

For each test case output an integer, the total number of derangements of the array.

Example

Input:

```
2
5
1 1 2 2 3
6
0 0 0 1 1 1
```

Output:

```
4
1
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