Problem G - Strange Permutations

Little Tomato loves permutations. One day he found an amazing property to the permutation $(1, 2, 3, \cdots, n)$: the neighboring two numbers are coprime to each other! (Of course k and $k + 1$ having their greatest common divisor equal to 1.)

Now, given a partial permutation of $1, 2, \cdots, n$, with blanked positions denoted by 0, can you help Little Tomato to find the number of ways to fill in this part of permutation and such that no two neighboring integers having greatest common divisor greater than 1?

Input

The first line contains an integer T ($1 \leq T \leq 20$) indicating the number of test cases.

For each test case, the first line contains an integer n ($1 \leq n \leq 20$). The second line contains n integers which is guaranteed to be a part of some permutation of 1 to n.

Output

For each test case please output the answer modulo 1000000007.

Sample Input

```
1
8
1 2 0 0 0 0 7 8
```

Sample Output

```
1
```