

Problem G Combination Lock

Time limit: 3 seconds

Memory limit: 256 megabytes

Problem Description

Jack is bad at remembering numbers, but he is good at computing. He cannot remember a 4-digit code to unlock his bicycle. However he can compute the product of 10^4 integers in one second, and he can remove all trailing zeros of an integer in one second. Therefore, he puts a slip to help himself to unlock his bicycle. He writes n non-negative integers s_1, \dots, s_n on the slip, and he can perform the following scheme to obtain the 4-digit code.

1. Compute $p = s_1 \times \dots \times s_n$.
2. If $p \geq 10^4$, then Jack removes all trailing zeros of p .
3. If p has at least 4 digits, then the code is the lowest 4 digits. Otherwise, Jack pads zeros to the left to obtain a 4-digit code.

For examples, the codes corresponding to $p = 10000$, $p = 12$, and $p = 3628800$ are 0001, 0012, and 6288 respectively. Try to write a program to find out the code to unlock Jack's bicycle.

Input Format

The first line of the input contains an integer t ($t \leq 25$). Each test case consists of two lines. On the first line, there is an integer n ($0 < n \leq 10^4$). On the second line, there are n integers s_1, \dots, s_n where $0 \leq s_i < 2^{31}$ for $i \in \{1, \dots, n\}$.

Output Format

For each test case, output the code unlocks Jack's bicycle.

Sample Input

```
3
4
10 10 10 10
4
1 2 3 2
10
1 2 3 4 5 6 7 8 9 10
```

Sample Output

```
0001
0012
6288
```