Problem M. Math is Fun

Input file:	*standard input*
Output file:	*standard output*
Time limit:	4 seconds
Memory limit:	256 mebibytes

Boy XYZ introduced a simple math function called *GLL* for an array of integers $S = \{a_1, a_2, \ldots, a_n\}$:

$$GLL(S) = GCD(S) \cdot LCM(S) \cdot LCM(S).$$

Here, $GCD(S) = GCD(a_1, a_2, \ldots, a_n)$ is the greatest common divisor of integers $a_1, a_2, \ldots, a_n$, and $LCM(S) = LCM(a_1, a_2, \ldots, a_n)$ is the least common multiple of integers $a_1, a_2, \ldots, a_n$.

For an array consisting of one element, *GCD* and *LCM* are equal to that element. For example, *GCD* of $S = \{x\}$ is x. Consider the *LCM* and *GCD* of an empty array as 0.

Now, XYZ is interested in finding the sum of *GLL* values of all subarrays for a given array A, but he finds the problem very hard. Help him calculate the following:

$$Answer = \sum_{S \subseteq A} GLL(S).$$

Here, $S \subseteq A$ means that S is a subarray of A, that is, the array A with some (possibly zero, possibly all) elements removed.

As the answer can be very large, print it modulo $10^9 + 7$.

Input

The first line of input contains T, the number of test cases ($1 \le T \le 50$). T test cases follow.

The first line of each test case contains N, the number of elements in A ($1 \le N \le 100$). The next line contains N space-separated positive integers: the elements of A. The numbers in the array are in the range $[1, 1000]$.

Output

For each test case, print the answer on a separate line.

Example

standard input	standard output
2 2 2 3 3 2 4 10	71 2904