GCD Determinant

English Vietnamese

We say that a set S = {x1, x2, …, xn} is factor closed if for any xi ∈ S and any divisor d of xi we have d ∈ S. Let's build a GCD matrix (S) = (sij), where sij = GCD(xi, xj) – the greatest common divisor of xi and xj. Given the factor closed set S, find the value of the determinant:

$$D_n = \begin{vmatrix} \gcd(x_1,x_1) & \gcd(x_1,x_2) & \gcd(x_1,x_3) & \dots & \gcd(x_1,x_n) \\ \gcd(x_2,x_1) & \gcd(x_2,x_2) & \gcd(x_2,x_3) & \dots & \gcd(x_2,x_n) \\ \gcd(x_3,x_1) & \gcd(x_3,x_2) & \gcd(x_3,x_3) & \dots & \gcd(x_3,x_n) \\ \dots & \dots & \dots & \dots & \dots \\ \gcd(x_n,x_1) & \gcd(x_n,x_2) & \gcd(x_n,x_3) & \dots & \gcd(x_n,x_n) \end{vmatrix}$$

Input

The input file contains several test cases. Each test case starts with an integer n (0 < n < 1000), that stands for the cardinality of S. The next line contains the numbers of S: x1, x2, …, xn. It is known that each xi is an integer, 0 < xi < 2*10^9. The input data set is correct and ends with an end of file.

Output

For each test case find and print the value Dn mod 1000000007.

Sample

Input :
2
1 2
3
1 3 9
4
1 2 3 6

Ouput:
1
12
4