



Problem F
Maximal Number of Divisors

Input File: F.IN

Output File: standard output

Program Source File: F.C, F.CPP, F.JAVA

Help Mr. Strange to solve the following problem: "Find the maximum number of positive divisors of all integers in the interval from 1 up to and including N ($1 \leq N \leq 42^{42}$)". Since it is Mr. Strange who solves the problem, the situation is complicated by the fact that he dislikes number P . Therefore, you should not find the actual maximum number of divisors of all possible numbers from 1 to N , but the maximum number of divisors only for numbers from 1 to N , which are not divisible by P .

The input file contains several data sets. Your program reads the number of data sets T ($2 \leq T \leq 100$), followed by the actual data sets. Each data set contains exactly three lines. The first line contains the number P (which is disliked by Mr. Strange; $2 \leq P \leq 1,000,000,007$). The second line contains the number K ($1 \leq K \leq 100$) of intervals $[1, N]$ for which the solution is to be found. The third line contains K space-separated integers, N_i , each in the range $1 \leq N_i \leq 42^{42}$ representing the upper limit of each interval

The result for each of the T data sets should be written on separate lines. The results for the intervals $[1, N_i]$ should be space-separated.

Sample input	Sample output
2	4 9
13	4 8
2	
8 42	
6	
2	
8 42	

Explanation. In each data set you are asked to find the maximal number of divisors for numbers in intervals $[1, 8]$ and $[1, 42]$. If Mr. Strange dislikes $P=13$, the maximum number of divisors is 4 and is reached for the numbers 6 (divisors 1, 2, 3 and 6) and 8 (divisors 1, 2, 4 and 8); the maximum number of divisors 9 is reached for the number 36. If Mr. Strange dislikes $P=6$, numbers 6, 12, 18, 24, 30, 36, 42 are prohibited. So, the same maximum 4 is reached only for the number 8; no number in the interval $[1, 42]$ has 9 divisors, but the maximum number 8 is reached for the number 40.