



**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.