Aalekh and Chutki

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	256 megabytes

We all know Aalekh secretly admires Chutki. As Valentines day is approaching, Aalekh had mustered all his courage and asked Chutki for a date. She agreed to go out with him but on the condition that he will help her in solving DS assignment. Assignment has one very tough question and He needs your help in solving that After all the hardwork, Aalekh reduced the problem to this: You will be given a number **r** and a stream **'A'** of numbers. You have to maintain a sorted list of all the numbers added so far in the list (say, P numbers were added.) and output the sum of values at the indexes 1, r, r^2, ..., r^x such that $r^{x+1} > \mathrm{P}$.

Input

The first line contains an integer **T**, which is the number of Testcases.
Followed by **2*T** lines describing the testcases. Every testcase is described in 2 lines as follows:
First line contains an integer **N** describing length of the stream A followed by an integer **r**.
Nextline contains N integers describing the stream A.

$1 \leq \mathrm{T} \leq 5$
$1 \leq \mathrm{N} \leq 10^5$
$2 \leq \mathrm{R} \leq N$
$0 \leq A_i \leq 10^9$

All A_i are distinct.

Output

Output N integers in the line (followed by a space) , $i-th$ integer is the desired answer after $i-th$ number is added to the list.

Example

standard input	standard output
2 9 2 9 4 5 6 3 12 16 19 1 6 3 4 8 9 1 3 6	9 13 9 18 13 13 13 32 25 4 4 13 9 5 5

Note

Problem uses 1-based indexing