

E. Devu and Birthday Celebration

time limit per test: 5 seconds

memory limit per test: 256 megabytes

input: standard input

output: standard output

Today is Devu's birthday. For celebrating the occasion, he bought n sweets from the nearby market. He has invited his f friends. He would like to distribute the sweets among them. As he is a nice guy and the occasion is great, he doesn't want any friend to be sad, so he would ensure to give at least one sweet to each friend.

He wants to celebrate it in a unique style, so he would like to ensure following condition for the distribution of sweets. Assume that he has distributed n sweets to his friends such that i^{th} friend is given a_i sweets. He wants to make sure that there should not be any positive integer $x > 1$, which divides every a_i .

Please find the number of ways he can distribute sweets to his friends in the required way. Note that the order of distribution is important, for example $[1, 2]$ and $[2, 1]$ are distinct distributions. As the answer could be very large, output answer modulo 1000000007 ($10^9 + 7$).

To make the problem more interesting, you are given q **queries**. Each query contains an n, f pair. For each query please output the required number of ways modulo 1000000007 ($10^9 + 7$).

Input

The first line contains an integer q representing the number of queries ($1 \leq q \leq 10^5$). Each of the next q lines contains two space-separated integers n, f ($1 \leq f \leq n \leq 10^5$).

Output

For each query, output a single integer in a line corresponding to the answer of each query.

Examples

input
5 6 2 7 2 6 3 6 4 7 4
output
2 6 9 10 20

Note

For first query: $n = 6, f = 2$. Possible partitions are $[1, 5]$ and $[5, 1]$.

For second query: $n = 7, f = 2$. Possible partitions are $[1, 6]$ and $[2, 5]$ and $[3, 4]$ and $[4, 3]$ and $[5, 2]$ and $[6, 1]$. So in total there are 6 possible ways of partitioning.