Binomial Coefficients Revenge

The binomial coefficient $C(N, K)$ is defined as $N! / K! / (N - K)!$ for $0 \le K \le N$.
Here $N! = 1 * 2 * ... * N$ for $N \ge 1$, and $0! = 1$.

You are given a prime number P and a positive integer N.

A_L is defined as the number of elements in the sequence $C(N, K)$, such that, P^L divides $C(N, K)$, but P^{L+1} does not divide $C(N, K)$. Here, $0 \le K \le N$.

Let M be an integer, such that, $A_M > 0$, but $A_L = 0$ for all $L > M$. Your task is to find numbers $A_0, A_1, ..., A_M$.

Input Format
The first line of the input contains an integer T, denoting the number of test cases. The description of T test cases follows. The only line of each test case contains two space-separated integers N and P.

Output Format
For each test case, display $M + 1$ space separated integers $A_0, A_1, ..., A_M$ on the separate line.

Constraints

1 ≤ T ≤ 100
1 ≤ N ≤ 10^{18}
2 ≤ P < 10^{18}
P is prime

Sample Input

```
3
4 5
6 3
10 2
```

Sample Output

```
5
3 4
4 4 1 2
```

Explanation

Example case 1. Values $C(4, K)$ are $\{1, 4, 6, 4, 1\}$. Each of them is not divisible by 5. Therefore, $A_0 = 5$, $A_1 = 0$, $A_2 = 0$, ..., hence the answer.

Example case 2. Values $C(6, K)$ are $\{1, 6, 15, 20, 15, 6, 1\}$. Among them $1, 20, 1$ are not divisible by 3, while remaining values $6, 15, 15, 6$ are divisible by 3, but not divisible by 9. Therefore, $A_0 = 3$, $A_1 = 4$, $A_2 = 0$, $A_3 = 0$, ..., hence the answer.

Example case 3. Values $C(10, K)$ are $\{1, 10, 45, 120, 210, 252, 210, 120, 45, 10, 1\}$. Among them $1, 45, 45, 1$ are not divisible by 2, values $10, 210, 210, 10$ are divisible by 2, but not divisible by 4, value 252 is divisible by 4, but not divisible by 8, finally, values $120, 120$ are divisible by 8, but not divisible by 16. Therefore, $A_0 = 4$, $A_1 = 4$, $A_2 = 1$, $A_3 = 2$, $A_4 = 0$, $A_5 = 0$, ..., hence the answer.