B. DZY Loves FFT

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

DZY loves Fast Fourier Transformation, and he enjoys using it.

Fast Fourier Transformation is an algorithm used to calculate convolution. Specifically, if a, b and c are sequences with length n, which are indexed from 0 to n - 1, and

We can calculate c fast using Fast Fourier Transformation.

DZY made a little change on this formula. Now

To make things easier, a is a permutation of integers from 1 to n, and b is a sequence only containing 0 and 1. Given a and b, DZY needs your help to calculate c.

Because he is naughty, DZY provides a special way to get a and b. What you need is only three integers n, d, x. After getting them, use the code below to generate a and b.

```
//x is 64-bit variable;
function getNextX() {
    x = (x * 37 + 10007) % 1000000007;
    return x;
}
function initAB() {
    for(i = 0; i < n; i = i + 1){
        a[i] = i + 1;
    }
    for(i = 0; i < n; i = i + 1){
        swap(a[i], a[getNextX() % (i + 1)]);
    }
    for(i = 0; i < n; i = i + 1){
        if (i < d)
            b[i] = 1;
        else
            b[i] = 0;
    }
    for(i = 0; i < n; i = i + 1){
        swap(b[i], b[getNextX() % (i + 1)]);
    }
}
```

Operation `x % y` denotes remainder after division x by y. Function `swap(x, y)` swaps two values x and y.

Input

The only line of input contains three space-separated integers n, d, x ($1 \le d \le n \le 100000$; $0 \le x \le 1000000006$). Because DZY is naughty, x can't be equal to 27777500.

Output

Output n lines, the i-th line should contain an integer c_{i-1}.

Examples

input
3 1 1

output
1 3 2

input
5 4 2

output
2 2 4 5 5

input
5 4 3

output
5 5 5 5 4

Note

In the first sample, a is $[1\ 3\ 2]$, b is $[1\ 0\ 0]$, so $c_0 = max(1 \cdot 1) = 1$, $c_1 = max(1 \cdot 0, 3 \cdot 1) = 3$, $c_2 = max(1 \cdot 0, 3 \cdot 0, 2 \cdot 1) = 2$.

In the second sample, a is $[2\ 1\ 4\ 5\ 3]$, b is $[1\ 1\ 1\ 0\ 1]$.

In the third sample, a is $[5\ 2\ 1\ 4\ 3]$, b is $[1\ 1\ 1\ 1\ 0]$.