

Contest Duration: 2025-06-07(Sat) 22:00 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20250607T2100&p1=248>) - 2025-06-07(Sat) 23:40 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20250607T2240&p1=248>) (local time) (100 minutes)

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G - Accumulation of Wealth

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Time Limit: 2 sec / Memory Limit: 1024 MiB

Score : 625 points

Problem Statement

You are given an integer $N \geq 2$ and an integer P between 0 and 100, inclusive. Let $p = P/100$.

There is a sequence A . Initially, the length of A is 1, and its only element is 1.

The following operation is repeated $N - 1$ times on sequence A :

- Let m be the smallest positive integer that does not appear in A . With probability p , perform operation 1; with probability $1 - p$, perform operation 2:
 - Operation 1: Append m to the end of A .
 - Operation 2: Let c_1, c_2, \dots, c_{m-1} be the number of times $1, 2, \dots, m - 1$ appear in A , respectively. Choose an integer k between 1 and $m - 1$, inclusive, with probability proportional to c_k . That is, choose k with probability $c_k / \sum_{j=1}^{m-1} c_j$. Then, append k to the end of A .

For each $k = 1, 2, \dots, N$, find the expected number of occurrences of k in A after $N - 1$ operations, modulo 998244353.

► Definition of expected value modulo 998244353

2026-01-02 (Fri)
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Constraints

- $2 \leq N \leq 10^5$
- $0 \leq P \leq 100$
- All input values are integers.

Input

The input is given from Standard Input in the following format:

```
N P
```

Output

Output N lines. The k -th ($1 \leq k \leq N$) line should contain the expected number of occurrences of k in A after the operations, modulo 998244353.

Sample Input 1

Copy

```
3 50
```

Copy

Sample Output 1

Copy

```
124780546  
124780545  
748683265
```

Copy

The operations proceed as follows:

- Initially, $A = (1)$.
- 1st operation: It becomes $A = (1, 2)$ with probability $1/2$, and $A = (1, 1)$ with probability $1/2$.
- 2nd operation:
 - If $A = (1, 2)$, it becomes $A = (1, 2, 3)$ with probability $1/2$, $A = (1, 2, 1)$ with probability $1/4$, and $A = (1, 2, 2)$ with probability $1/4$.
 - If $A = (1, 1)$, it becomes $A = (1, 1, 2)$ with probability $1/2$, and $A = (1, 1, 1)$ with probability $1/2$.

The expected numbers of occurrences of 1, 2, 3 in the final A are $\frac{15}{8}$, $\frac{7}{8}$, $\frac{1}{4}$, respectively.

Sample Input 2

Copy

```
2 0
```

Copy

Sample Output 2

Copy

```
2
```

```
0
```

Copy

Sample Input 3

Copy

```
5 24
```

Copy

Sample Output 3

Copy

```
297734288  
442981554  
937492320  
798158491  
518366411
```

Copy

```
'#telegram)
```

```
url=https%3A%2F%2Fatcoder.jp%2Fcontests%2Fabc409%2Ftasks%2Fabc409_g%3Flang%3Den&title=G%20-h)
```

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