# A. Competition Venue Design

**Time Limit:** `1s`
**Memory Limit:** `512MB`

Volt is designing the road network for the marathon to ensure orderly transport of supplies and smooth spectator flow.

He has selected $n$ stations and can build several **one-way** roads between them, without duplicating any road.

Volt does not want the fleas to get lost: the built roads must **not** form any cycles.

Volt also wants the road network to have good connectivity: there must **not** exist three stations $(a, b, c)$ such that $a$ cannot reach $b$, $b$ cannot reach $c$, and $c$ cannot reach $a$.

A road network that satisfies **both** conditions above is called a **good graph**. Volt wants to know how many good graphs there are. Since this number could be large, you need to compute the answer **modulo** prime number $P$.

## Input Format

One line containing two integers, $n$ and $P$.

## Output Format

One line containing a single integer: the number of good graphs modulo $P$.

## Sample 1

### Input

```
3 835199921
```

### Output

```
18
```

### Explanation

Let $(x, y)$ denote a one-way road from $x$ to $y$.

- Choosing edges $(1, 2), (1, 3)$ forms a good graph. There are 3 such graphs by permuting labels.
- Choosing edges $(1, 2), (2, 3)$ forms a good graph. There are 6 such graphs by permuting labels.
- Choosing edges $(1, 2), (1, 3), (2, 3)$ forms a good graph. There are 6 such graphs by permuting labels.
- Choosing edges $(1, 3), (2, 3)$ forms a good graph. There are 3 such graphs by permuting labels.

Some examples of **invalid** configurations:

- Edges $(1, 2)$ only is **not** a good graph : $1$ can't reach $3$, $3$ can't reach $2$, and $2$ can't reach $1$.
- Edges $(1, 2), (2, 1)$ form a cycle and thus violate the DAG requirement.

Altogether, there are $3 + 6 + 6 + 3 = 18$ good graphs for $n = 3$.

## Sample 2

### Input

```
16 828234769
```

### Output

```
372590002
```

## Samples 3–9

See the attached files.

## Constraints

For all test cases:

- $1 \leq n \leq 10^6$
- $10^8 \leq P \leq 10^9$, and $P$ is a prime number.

| Subtask | Points | Max $n$ | Special Properties |
|---|---|---|---|
| 1 | 8 | 5 | — |

| Subtask | Points | Max $n$ | Special Properties |
|---|---|---|---|
| 2 | 8 | 18 | — |
| 3 | 16 | 200 | — |
| 4 | 10 | 5000 | $P = 998244353$ |
| 5 | 10 | 5000 | — |
| 6 | 12 | $2 \times 10^5$ | $P = 998244353$ |
| 7 | 12 | $2 \times 10^5$ | — |
| 8 | 12 | $10^6$ | $P = 998244353$ |
| 9 | 12 | $10^6$ | — |