# Problem D. Data Generation

Time limit: 1 seconds
Memory limit: 64 Megabytes

Yoshinow2001 is making data for his problem. He wants to generate a random permutation of $\{0, \ldots, n-1\}$ , so he used the following algorithm:

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**Input:** $n, m$
1: $ans = 0$
2: **for** $i = 0$ **to** $n - 1$ **do**
3: $\quad a[i] = i$
4: **end for**
5: **for** $i = 1$ **to** $m$ **do**
6: $\quad$ **swap**($a$[**rand()** mod$n$],$a$[**rand()** mod$n$])
7: **end for**
8: **for** $i = 0$ **to** $n - 1$ **do**
9: $\quad$ **if** $a[i] \neq i$ **then**
10: $\quad\quad ans = ans + 1$
11: $\quad$ **end if**
12: **end for**
**Output:** $ans$

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Here, we can assume that the function **rand()** mod$n$ is able to generate integer randomly in the set $\{0, \ldots, n-1\}$ with equal probability.
Now Yoshinow2001 is concerned that this algorithm is not random enough —— after all, if you want to randomize a permutation, the expected number of elements for $a_i \neq i$ should be $n-1$. So he wants to ask what the mathematical expectation of the final $ans$ is.

## Input

The first line of input is a positive integer $T(1 \leq T \leq 10^5)$ representing the number of data cases.
For each cases consists of a single line of two integers $n, m$, separated by a space. Where $1 \leq n \leq 10^{18}$,$0 \leq m \leq 10^{18}$, ensure that $n$ is not a multiple of 998 244 353.

## Output

For each cases, output a line with a positive integer representing the answer mod 998 244 353.

## Example

| standard input | standard output |
|---|---|
| 3<br>1 0<br>1 1<br>2 1 | 0<br>0<br>1 |