

Mad Mod

Moduling(%) is a famous operation in programming world.Sometimes kids love to mod(%) a number by another number.They also love to calculate factorial as factorial is a sequential multiplying process.But they noticed to calculate (70!) the scientific calculator returned "Math Error".And started to crying.Stop their crying by solve this problem.

Input

The first line contains t ($1 \leq t \leq 15$) the number of queries.The first line of each query contains two integers n and x (n is less than 8388700 and x is less than 10^{15}) where n is for getting factorial value and x is moduling value.

Output

Your task is to calculate $(n!) \% x$.

Example

Input:

```
3
5 7
10 231
1 1
```

Output:

```
1
21
0
```

Note:Here in first input $5! = 1 * 2 * 3 * 4 * 5$ or 120.Then $120 \% 7 = 1$.