

Given an array of  $n$  integers  $X_{1 \leq i \leq n}$ , the span  $S$  of  $X$  is an array of  $n$  integers with  $S_i$  being the maximum number of consecutive elements  $X_j$  immediately preceding  $X_i$  such that  $X_j \leq X_i$ . In mathematical notation, elements of  $S$  are thus defined,

$$S_i = |A_i|,$$
$$A_i = \{j \leq i \mid \forall k (j \leq k \leq i) (X_k \leq X_i)\}.$$

As an example, the span of the array  $X = [40, 2, 10, 50, 30, 15]$ , is the array  $S = [1, 1, 2, 4, 1, 1]$ .

Now suppose, for given values of integers  $m$  and  $n$ , that  $X_{1 \leq i \leq n} = (P_i \bmod m)$  where  $P_i$  is the  $i$ -th prime number. We need to compute the sum-modulus- $m$  of the elements of array  $S$ , span of  $X$ . If  $m = 10$  and  $n = 7$ , we have  $X = [2, 3, 5, 7, 1, 3, 7]$  and  $S = [1, 2, 3, 4, 1, 2, 7]$ . The desired value is then,  $((1 + 2 + 3 + 4 + 1 + 2 + 7) \bmod 10) = 0$ .

## Input

The input file provides an integer  $T$ , on the first line, as the number of test-cases. For the next  $T$  lines, each line represents a test-case with two integers  $n$  and  $m$  both in the interval  $[1, 100000]$ .

## Output

For each test-case print the sum of the elements of  $S \bmod m$ , as described above.

## Sample Input

```
3
7 10
10 16
10 7
```

## Sample Output

```
0
5
6
```