12384   Span

Given an array of n integers $X_{1 \le i \le n}$, 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 $X_j \le X_i$. In mathematical notation, elements of S are thus defined,

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

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 $X_{1 \le i \le n} = (P_i \bmod m)$ 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

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0
5
6
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