Maximum Subarray Sum ★

Problem Submissions Leaderboard Editorial Topics

We define the following:

- A subarray of array a of length n is a contiguous segment from $a[i]$ through $a[j]$ where $0 \leq i \leq j < n$.
- The sum of an array is the sum of its elements.

Given an n element array of integers, a, and an integer, m, determine the maximum value of the sum of any of its subarrays modulo m. For example, Assume $a = [1, 2, 3]$ and $m = 2$. The following table lists all subarrays and their moduli:

```
            sum    %2
[1]         1      1
[2]         2      0
[3]         3      1
[1,2]       3      1
[2,3]       5      1
[1,2,3]     6      0
```

The maximum modulus is 1.

Function Description

Complete the maximumSum function in the editor below. It should return a long integer that represents the maximum value of $subarray\ sum\ \%\ m$.

maximumSum has the following parameter(s):

- a: an array of long integers, the array to analyze
- m: a long integer, the modulo divisor

Input Format

The first line contains an integer q, the number of queries to perform.

The next q pairs of lines are as follows:

- The first line contains two space-separated integers n and (long)m, the length of a and the modulo divisor.
- The second line contains n space-separated long integers $a[i]$.

Constraints

- $2 \leq n \leq 10^5$
- $1 \leq m \leq 10^{14}$
- $1 \leq a[i] \leq 10^{18}$
- $2 \leq$ the sum of n over all test cases $\leq 5 \times 10^5$

Output Format

For each query, return the maximum value of $subarray\ sum\ \%\ m$ as a long integer.

Sample Input

```
1
5 7
3 3 9 9 5
```

Sample Output

```
6
```

Explanation

The subarrays of array $a = [3, 3, 9, 9, 5]$ and their respective sums modulo $m = 7$ are ranked in order of length and sum in the following list:

1. $[9] \Rightarrow 9 \% 7 = 2$ and $[9] \rightarrow 9 \% 7 = 2$
   $[3] \Rightarrow 3 \% 7 = 3$ and $[3] \rightarrow 3 \% 7 = 3$
   $[5] \Rightarrow 5 \% 7 = 5$
2. $[9, 5] \Rightarrow 14 \% 7 = 0$
   $[9, 9] \Rightarrow 18 \% 7 = 4$
   $[3, 9] \Rightarrow 12 \% 7 = 5$
   $[3, 3] \Rightarrow 6 \% 7 = 6$
3. $[3, 9, 9] \Rightarrow 21 \% 7 = 0$
   $[3, 3, 9] \Rightarrow 15 \% 7 = 1$
   $[9, 9, 5] \Rightarrow 23 \% 7 = 2$
4. $[3, 3, 9, 9] \Rightarrow 24 \% 7 = 3$
   $[3, 9, 9, 5] \Rightarrow 26 \% 7 = 5$
5. $[3, 3, 9, 9, 5] \Rightarrow 29 \% 7 = 1$

The maximum value for $subarray\ sum\ \%\ 7$ for any subarray is 6.

Change Theme JavaScript (Node.js)

```
26
27  // Complete the maximumSum function below.
28  function maximumSum(a, m) {
29  let max=0,t=0
30      let pa=a.map((c)=>{
31          t=(c+t)%m
32          max=(max>t)?max:t;
33          return t});
34      if (max==m-1) return max;
35      // console.log(max,pa);
36
37      class TNode {
38          constructor(val,left=null,right=null){
39              this.val = val;
40              this.left =left;
41              this.right=right;
42          }
43          insert(v, preV=null){
44              if (v > this.val){
45                  // prev = this.val
46                   if (this.right) {
47                       return this.right.insert(v, preV)
48                   } else {
49                       this.right = new TNode(v)
```

Line: 77 Col: 15

Upload Code as File Test against custom input Run Code Submit Code

Congratulations!

You have passed the sample test cases. Click the submit button to run your code against all the test cases.

Sample Test case 0

Sample Test case 1

Sample Test case 2

Input (stdin) Download

```
1
5 7
3 3 9 9 5
```

Your Output (stdout)

```
6
```

Expected Output Download

```
6
```