D - Match, Mod, Minimize 2

Editorial (/contests/abc416/tasks/abc416_d/editorial)

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Time Limit: 2 sec / Memory Limit: 1024 MiB

Score : 400 points

Problem Statement

You are given length-N sequences $A = (A_1, A_2, \ldots, A_N)$ and $B = (B_1, B_2, \ldots, B_N)$ consisting of non-negative integers, and a positive integer M.

When you can freely rearrange the elements of A, find the minimum possible value of $\displaystyle\sum_{i=1}^{N} ((A_i + B_i) \bmod M)$.

T test cases are given, so find the answer for each of them.

Constraints

- $1 \leq T \leq 10^5$
- $1 \leq N \leq 3 \times 10^5$
- $1 \leq M \leq 10^9$
- $0 \leq A_i, B_i < M$
- The sum of N over all test cases is at most 3×10^5.
- All input values are integers.

Input

The input is given from Standard Input in the following format:

$$
\begin{aligned}
&T \\
&\mathrm{case}_1 \\
&\mathrm{case}_2 \\
&\vdots \\
&\mathrm{case}_T
\end{aligned}
$$

Each test case case_i is given in the following format:

$$
\begin{aligned}
&N \quad M \\
&A_1 \quad A_2 \quad \dots \quad A_N \\
&B_1 \quad B_2 \quad \dots \quad B_N
\end{aligned}
$$

Output

Output T lines.

The j-th line should contain the minimum possible value of $\sum_{i=1}^{N} ((A_i + B_i) \bmod M)$ for the j-th test case.

Sample Input 1 Copy

Copy

```
3
3 6
3 1 4
2 0 1
1 1000000000
999999999
999999999
10 201
144 150 176 154 110 187 38 136 111 46
96 109 73 63 85 1 156 7 13 171
```

Sample Output 1 Copy

Copy

```
5
999999998
619
```

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For the first test case, if we rearrange A as $4, 3, 1$, then $(A_i + B_i) \bmod M$ becomes $0, 3, 2$, respectively, and their sum is 5.

#telegram)

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