

Contest Duration: 2025-07-26(Sat) 22:00 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20250726T2100&p1=248>) - 2025-07-26(Sat) 23:40 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20250726T2240&p1=248>) (local time) (100 minutes)

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D - Match, Mod, Minimize 2

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Time Limit: 2 sec / Memory Limit: 1024 MiB

Score : 400 points

Problem Statement

You are given length- N sequences $A = (A_1, A_2, \dots, A_N)$ and $B = (B_1, B_2, \dots, B_N)$ 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

$$\sum_{i=1}^N ((A_i + B_i) \bmod M).$$

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.

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Input

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

```
T
case1
case2
⋮
caseT
```

Each test case case_{*i*} is given in the following format:

```
N  M
A1 A2 ... AN
B1 B2 ... BN
```

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](#)

```
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
```

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Sample Output 1

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```
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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