

D - On AtCoder Conference

题解 (/contests/abc429/tasks/abc429_d/editorial)

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Time Limit: 2 sec / Memory Limit: 1024 MiB

Score : 425 points

Problem Statement

There is a pond with a circumference of M , and on its shore stand one hut and N people.

For a real number x ($0 \leq x < M$), define point x as the location that is x distance clockwise from the hut.

The i -th person is at point A_i . **Multiple people may be standing at the same location.**

Additionally, an integer C not greater than N is given. For $i = 0, 1, \dots, M - 1$, define X_i as follows:

1. Takahashi starts at point $(i + 0.5)$ and begins moving clockwise.
2. Takahashi continues moving (clockwise) as long as the total number of people he has met is less than C , and stops when it becomes C or more. Here, "meeting a person at point y " means that Takahashi reaches point y .
3. Let X_i be the number of people Takahashi met before stopping. Here, if there are multiple people at the point where Takahashi stopped, all the people there are counted as people he met, and particularly, X_i may be greater than C .

Find the sum of X_i over $i = 0, 1, \dots, M - 1$, that is, $\sum_{i=0}^{M-1} X_i$.

Constraints

- $1 \leq N \leq 5 \times 10^5$
- $1 \leq M \leq 10^{12}$
- $0 \leq A_i \leq M - 1$
- $1 \leq C \leq N$
- All input values are integers.

Input

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

```
N M C
A_1 A_2 ... A_N
```

Output

Print the sum of X_i over $i = 0, 1, \dots, M - 1$ on a single line.

Sample Input 1

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```
5 3 2
1 2 1 0 1
```

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Sample Output 1

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9

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When $i = 0$, Takahashi starts at point 0.5 and moves clockwise. Then, the following happens:

- At point 1, he meets the 1st, 3rd, and 5th people, a total of three people, and the total number of people met so far is 3. This is not less than $C = 2$, so Takahashi stops there. Therefore, $X_0 = 3$.

When $i = 1$, Takahashi starts at point 1.5 and moves clockwise. Then, the following happens:

- At point 2, he meets the 2nd person. The total number of people met so far is 1, so he continues moving.
- At point 0, he meets the 4th person, and the total number of people met so far is 2. This is not less than $C = 2$, so Takahashi stops there. Therefore, $X_1 = 2$.

When $i = 2$, Takahashi starts at point 2.5 and moves clockwise. Then, the following happens:

- At point 0, he meets the 4th person. The total number of people met so far is 1, so he continues moving.
- At point 1, he meets the 1st, 3rd, and 5th people, a total of three people, and the total number of people met so far is 4. This is not less than $C = 2$, so Takahashi stops there. Therefore, $X_2 = 4$.

Therefore, the answer is $X_0 + X_1 + X_2 = 3 + 2 + 4 = 9$.

Sample Input 2

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```
1 1000000000000 1
1
```

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Sample Output 2

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1000000000000

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Regardless of the starting position, Takahashi stops when he meets the only person standing around the pond, who is at point 1. Therefore, $X_i = 1$ regardless of i , and the answer is 10^{12} .

C++ 20 (gcc 12.2)

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