

Rain Buckets

CITS3001 Advanced Algorithms — Time limit: 3s

Raindrops land on a gutter of length L millimetres. The gutter drains into k buckets of equal width: a drop landing at position x (measured in whole millimetres, $0 \leq x < L$) falls into bucket number $\lfloor x \cdot k / L \rfloor$ (buckets are numbered 0 to $k - 1$).

Report how many drops each bucket catches. This is exactly the distribution step of bucket sort — and a reminder that the bucket index should be computed with integer arithmetic.

Input

The first line contains three integers n , L and k ($1 \leq n \leq 2 \cdot 10^5$, $1 \leq k \leq \min(L, 10^5)$, $1 \leq L \leq 10^9$). The second line contains n integers $x_1, \dots, x_n$ ($0 \leq x_i < L$), the landing positions.

Output

Output k lines. Line i (for $i = 0, \dots, k - 1$) contains the number of drops in bucket i .

Sample Input 1

```
5 10 2
0 4 5 9 9
```

Sample Output 1

```
2
3
```

Sample Input 2

```
3 7 3
0 3 6
```

Sample Output 2

```
1
1
1
```