Icarus

The Hellenic Space Agency (HSA) has recently signed an agreement with NASA and Greece has become one of the few countries in the world to send their own robotic vehicle to the moon. Conceding to the agreement, Greek scientists have developed Icarus, a robotic vehicle programmed to collect valuable material from the moon. Icarus has to collect N rock samples, each of which becomes available for harvesting at a different time. Icarus cannot collect a sample i at any time before its harvest time X_i. Moreover, the samples are very sensitive and need to be stored in special storage conditions at the HSA station, as soon as possible. The **waiting time** for sample i is defined as the time interval between X_i and the time when Icarus departs from the moon after having collected it.

Icarus begins its journey from the moon, where it collects some samples. Then, it travels to the HSA station to deliver the collected samples and returns back to the moon to re-load. The duration of a journey from the moon to the HSA station and back takes M hours. Icarus can make unlimited journeys and can carry unlimited samples on each of these journeys.

You are asked to write a program to help Icarus minimize the maximum waiting time for any of the samples.

Input

Your program must read from the standard input.

The first line will contain two space-separated integers N and M: the number of samples Icarus has to collect and the time it takes to make a full journey from the moon to the HSA station and back.

The second line will contain N space-separated integers X_i: the times when the samples will become ready for harvesting from the moon. These times (in hours) will be provided in arbitrary order.

All data samples are guaranteed to have different harvest times.

Output

Your program must print a single line to the standard output, consisting of a single integer: the least possible value of the maximum waiting time for any of the samples.

Constraints

- $1 \leq N \leq 10^5$
- $1 \leq M \leq 10^9$
- $0 \leq X_i \leq 10^9$
- Time and memory limit: See the CMS.

Subtasks

- Subtask 1 (7 points): $1 \leq N \leq 10, \quad 1 \leq M \leq 10, \quad 0 \leq X_i \leq 50$
- Subtask 2 (16 points): $1 \leq N \leq 10^5, \quad 1 \leq M \leq 50, \quad 0 \leq X_i \leq 10^5$
- Subtask 3 (25 points): $1 \leq N \leq 10^3$

- Subtask 4 (52 points): No further constraints.

Example 1

Input

```
5 3
0 1 7 2 5
```

Output

```
2
```

Explanation

There are many different scenarios that give 2 as the output. In one of them, Icarus leaves the moon at time 2 taking the first three samples available with harvest times 0, 1 and 2. Since the total time of its journey is 3 hours, it will return to the moon at time 5. Icarus can then depart again at time 7, taking the last two samples with harvest times 5 and 7. Thus, the maximum waiting time for a sample is 2 hours, for samples with harvest times 0 and 5.

In a different scenario, Icarus leaves the moon at times 0, 3, 6 and 9.

Example 2

Input

```
4 3
0 8 2 6
```

Output

```
1
```

Explanation

Icarus can depart as soon as the first sample becomes available at time 0. Then, it can leave at time 3 with the sample with harvest time 2 and at time 6 with the sample with harvest time 6. Lastly, it can leave at time 9 with the sample with harvest time 8. In this way, the maximum waiting time for every sample is 1 hour.