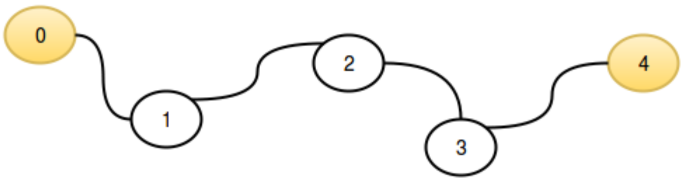
Flatland Space Stations

Flatland is a country with n cities, m of which have space stations. Its cities (c) are numbered from 0 to $n-1$, where i^{th} city is referred to as c_i.

Between each c_i and c_{i+1} (where $0 \leq i < n$), there exists a bidirectional road $1\ km$ long.

For example, if $n = 5$ and cities c_0 and c_4 have space stations, Flatland would look like this:



For each city, determine its distance to the *nearest* space station and *print the maximum* of these distances.

Input Format

The first line consists of two space-separated integers, n and m .
The second line contains m space-separated integers $c_0, c_1, \ldots c_{m-1}$ denoting the index of each city having a space station. These values are *unordered* and unique.

Constraints

- $1 \leq n \leq 10^5$
- $1 \leq m \leq n$
- It is guaranteed that there will be at least 1 city with a space station, and no city has more than one.

Output Format

Print an integer denoting the maximum distance that an astronaut in a Flatland city would need to travel to reach the nearest space station.

Sample Input 0

```
5 2
0 4
```

Sample Output 0

```
2
```

Explanation 0

This sample corresponds to the example given in the problem statement above. The distance to the nearest space station for each city is listed below:

- c_0 has distance $0\ km$, as it contains a space station.
- c_1 has distance $1\ km$ to the space station in c_0.
- c_2 has distance $2\ km$ to the space stations in c_0 and c_4.
- c_3 has distance $1\ km$ to the space station in c_4.

- c_4 has distance $0\ km$, as it contains a space station.

We then take $max(0, 1, 2, 1, 0) = 2$, and print 2 as our answer.

Sample Input 1

```
6 6
0 1 2 4 3 5
```

Sample Output 1

```
0
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Explanation 1

In this sample, $n = m$ so every city has space station and we print 0 as our answer.