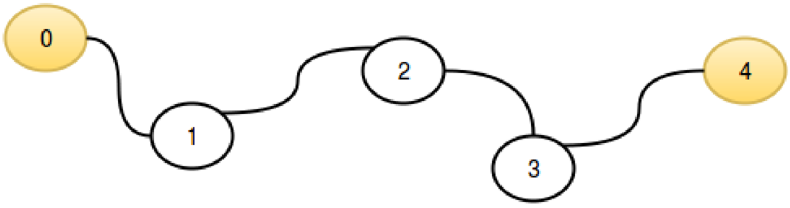
Flatland Space Stations

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 $0 \leq i \lt n$), 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 $c_0,c_1,...c_{m-1}$ denoting the index of each city having a space station. These values are *unordered* and unique.

Constraints
$1 \le n \le 10^5$
$1 \le m \le n$

Note: 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 1:

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5 2
0 4
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Input Output 1:

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2
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Sample Input 2:

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6 6
0 1 2 4 3 5
```

Input Output 2:

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0
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Explanation

Sample 1:

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_1 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 2:

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