IOI '14 Practice Task 2 - Station

Time limit: 1.0s **Memory limit:** 64M

IOI '14 - Taipei, Taiwan

Move from one station to another

Taiwan has a rail system that connects all train stations. The rail system has n stations indexed from 0 to $n-1$. Every two adjacent train stations are 1 kilometer apart, and some stations have lodge service. Also the first and the last stations do have lodge service.

Jian-Jia wants to travel through Taiwan along this railway system. Jian-Jia will start from the first station and stop at the last station. Since Jian-Jia bought a discount ticket, he can only travel at most k kilometers per day. In addition, Jian-Jia only wishes to stop at stations that have lodge service. Please determine the minimum number of days for Jian-Jia to travel from the first to the last station.

Example

We assume that there are 10 stations, and station 0, 1, 2, 3, 4, 6, 7, 9 have lodge service. Let k be 4, i.e., Jian-Jia can only travel 4 kilometers per day, then he needs at least 3 days to travel from station 0 to 9. For example, he can move from station 0 to station 3 in the first day, station 3 to 7 in the second day, and station 7 to 9 in the third day. If k is 1 then it is *impossible* to travel from the first station to the last station.

Statement

Given the locations of all stations with lodge service and the limit k, determine whether it is possible for Jian-Jia to travel from the first station to the last station, and if possible, the minimum number of days for Jian-Jia to do so.

Input Specification

- Line 1: two integers n and k, the number of stations and the limit;
- Line 2: `lodge[0]`, ..., `lodge[n-1]`
  `lodge` is the array indicating whether a station has lodge service. For example, if station i has lodge service, then `lodge[i]` will be 1, and 0 otherwise. We assume that both `lodge[0]` and `lodge[n-1]` are 1.

Output Specification

The output should contain one integer – the minimum number of days for Jian-Jia to travel from the first station to the last station if possible. If not possible, then output `-1`.

Sample Input 1

```
11 3
1 1 0 0 1 1 0 1 0 0 1
```

Sample Output 1

```
4
```

Sample Input 2

```
13 3
1 0 0 0 1 0 0 1 0 0 0 0 1
```

Sample Output 2

```
-1
```

Constraints

Subtask 1 [10%]

$2 \leq n \leq 200$

$1 \leq k \leq 20$

Subtask 2 [20%]

$2 \leq n \leq 50\,000$

$1 \leq k \leq 20$

Subtask 3 [70%]

$2 \leq n \leq 500\,000$

$1 \leq k \leq 3\,000$