

## 1. Problem of Problems

You're the in-charge of a **Code-A-Thon** that your department is about to conduct in your college. You prepared **N** problems, where problem  $i$  has the difficulty rating of  $A_i$ . You will do the following process.

- remove some (possibly zero) problems from the list;
- rearrange the remaining problems in any order you wish.

A round in **Code-A-Thon** is considered **balanced** if and only if the absolute difference between the difficulty of any two consecutive problems is *at most* **K**.

What is the **minimum** number of problems you have to remove so that the arrangement of problems is **balanced**?

### Input Format:

First line of input contains two integers **N** and **K**.

Second line of input contains **N** space separated integers denoting difficulty level of each problem.

### Output Format:

Print the minimum number of problems you need to remove from the problems list to make round balanced.

### Constraints:

$$1 \leq N \leq 10^3, 1 \leq K \leq 5 \times 10^3, 1 \leq A[i] \leq 10^6$$

### Sample I/O:

#### Input 1:

5 1  
1 2 4 5 6

#### Output 1:

2

#### Input 2:

1 2  
10

#### Output 2:

0

#### Input 3:

8 3  
17 3 1 20 12 5 17 12

#### Output 3:

5

#### Input 4:

3 4  
1 10 5

#### Output 4:

1

### Explanation:

For input1,

You have to remove first 2 elements to make the round balanced.

For input4,

You have to remove second element to make the round balanced.

## 2. Minimum Room Requirement

Aditya Junior College wants to take the students to **Aditya University** to explore the campus in a 3-day visit.

During the visit students will stay in the college hostel rooms.

Among the students there are,

**a** introverts

**b** extroverts

**c** ambiverts

1. Each introvert wants to live in a room alone. Thus, a room with an introvert must contain only one person - the introvert himself/herself
2. Each extrovert wants to live in a room with two others. Thus, the room with an extrovert must contain **exactly three people**
3. Each ambivert is fine any option (living alone, with one other person, or with two others)

The management want to fulfil the requirement of each student.

Help the management to find out the **minimum** number of rooms needed, so that all the students can be accomodated according to their preferences.

If it is impossible to accommodate the students according to their preference print **-1**.

### Input Format:

Only line of input contains **a**, **b** and **c** denoting number introverts, extroverts and ambiverts respectively.

### Output Format:

Print the **minimum number of rooms required** or **-1** according to the description.

### Constraints:

$$0 \leq a, b, c \leq 10^9$$

### Sample I/O:

#### Input 1:

1 2 3

#### Output 1:

3

#### Input 2:

1 4 1

#### Output 2:

-1

#### Input 3:

1 1 1

#### Output 3:

-1

#### Input 4:

1 4 2

#### Output 4:

3

#### Input 5:

0 24 0

#### Output 5:

8

**Input 6:**

19 7 18

**Output 6:**

28

**Explanation:**

In the input 1,

1 room will be given to the introverts,

1 room will be shared by two extroverts and one ambivert,

and the last room will be shared by two ambiverts.

In total, 3 rooms are needed.

In the input 2,

three extroverts will take 1 room,

and 1 room will be taken by an introvert.

Then, one extrovert and one ambivert will be left. This extrovert will not be able to live with two others.