

### Finding Way

You are given a directed graph  $G$  consisting of  $N$  nodes, from 1 to  $N$ , and  $M$  edges. You have to check whether there exists a way from node 1 to node  $N$  and back such that each edge is used only once. If it exists, print “Yes”, else print “No”.

Note: There can be multiple edges joining the same two nodes.

Constraints:

$$1 \leq T \leq 15$$

$$1 \leq N \leq 10^5$$

$$0 \leq M \leq 2 \times 10^5$$

Input format:

The first line contains  $T$  : the number of test cases. Each test case contains  $N$  and  $M$  separated by space. Next  $M$  lines contains  $n1$  and  $n2$  separated by a space where  $n1$  and  $n2$  represents the nodes.

Output format:

Output  $T$  lines . For each test case, print either “Yes” or “No” (without quotes).

Sample Input:

```
2
4 4
1 2
2 3
3 4
4 1
4 3
1 2
2 3
3 1
```

Sample Output:

```
Yes
No
```

### Maximum Number

Given an array of N numbers, find the maximum number k such that there are k numbers in the array which are greater than or equal to k and the rest are no more than k.

Constraints:

$$1 < T \leq 20$$

$$1 < N \leq 10^5$$

$$0 < A_i \leq 10^9$$

( $A_i$  refers to the  $i$ th number in the array)

Input Format:

The first line contains T denoting the number of test cases. Each test case consists of two lines : first line contains N referring to the number of elements in the array. Second line contains the N elements separated by space.

Output Format:

For each test case, output single line containing k.

Sample Input :

```
2
5
3 0 6 1 5
1
10
```

Sample Output:

```
3
1
```

### Mischievous Tom

Tom is very mischievous. He always talks and disturbs everybody in the class. One day, in order to keep him busy, his teacher gave him an array of  $N$  non-negative numbers. She asked him to count the number of contiguous subarrays such that the sum of all elements in the subarray is divisible by  $k$ . As usual Tom is not interested in doing this and wants your help.

Constraints :

$1 \leq T \leq 20$

$1 \leq N \leq 10^5$

Sum of all numbers in array  $\leq 10^5$

$1 \leq k \leq 10^5$

Input format :

First line contains  $T$ , number of test cases.

Each test case consists of two lines. First line contains  $N$  (no. of elements) and  $K$ . Second line contains  $n$  numbers, separated by space.

Output format:

$T$  lines containing the answer.

Sample Input :

1

5 3

1 0 2 0 1

Sample Output:

6

### Three Strings

Given three strings, you have to find the minimum length of the string that contains all the three strings as substring.

Constraints:

Length of the given strings  $\leq 10^5$

Input Format:

Three lines containing the three given strings.

Output Format:

Length of the required string.

Example:

Input :

rsrfgrsr

sdtrsr

t

Output:

11

### **Towers**

There are N residential towers in a city standing side by side. Tom is standing on the first building and wants to reach the last one. But, he can jump only to either of the two buildings(if present) in either side of the building on which he is standing or to the building whose name start with the same letter as the building on which he is standing. Calculate the minimum number of jumps Tom needs to make in order to reach the last building.

Input:

First line contains N( $\leq 10^5$ ) followed by N lines containing the name of the buildings( Names can have spaces and length  $\leq 10^5$  and all are lower-case).

Output:

Single line containing the number of jumps required.

Example:

Input :

5  
skyline towers  
blue bells  
orchard house  
lakeshore  
shimmering heights

Output:

1