

Longest Consecutive Sequence 2

Given an **unsorted** array of integers nums, return the length of the longest consecutive elements sequence.

You must write an algorithm that runs in $O(n)$ time.

SC $\rightarrow O(n)$

TC $\rightarrow O(n)$

1. add all in hs.

2. Traverse array.

ans = 4

Sample Input 0

6
100 4 200 3 1 2

Sample Output 0

4

(
100 3 200 4 1 2 101 199 198 19
0 1 2 3 4 5 6 7 8 9
i

len = pre - ple - 1

A[i] = 19

ple = 18

pre = 20

18 ○ 20

20 - 18 - 1

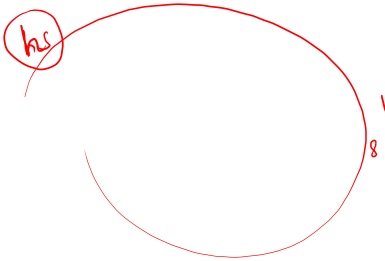
= 2 - 1
= 1

198 199 200 }₃

100 101 }₂

1 2 3 4 }₄

19 }₁



check if (A[i]) is present

present

↳ remove

Not

(already processed) → continue

```

4 public class Solution {
5     public static void main(String[] args) {
6         Scanner scn = new Scanner(System.in);
7         int n = scn.nextInt();
8         int [] A = new int[n];
9         for(int i = 0; i < n; i++){
10             A[i] = scn.nextInt();
11         }
12         HashSet<Integer> hs = new HashSet<>();
13         for(int ele : A){
14             hs.add(ele);
15         }
16         int ans = 0;
17         for(int i = 0; i < n; i++){
18             if(hs.contains(A[i])){
19                 hs.remove(A[i]);
20                 int ple = A[i] - 1;
21                 int pre = A[i] + 1;
22
23                 while(hs.contains(ple)){
24                     hs.remove(ple);
25                     ple--;
26                 }
27                 while(hs.contains(pre)){
28                     hs.remove(pre);
29                     pre++;
30                 }
31                 ans = Math.max(ans, pre-ple-1);
32
33             }else{//already processed
34                 continue;
35             }
36         }
37         System.out.println(ans);
38     }
39 }

```

hs



ans = ~~0~~ 24

ple = ~~199~~ 198 197

pre = 201

A → 100 3 1 101 19 200 199 2 198 4

 6 1 2 3 4 5 6 7 8 9

Check if array pair are divisible by K

Given an array of integers arr of even length n and an integer k .

We want to divide the array into exactly $n / 2$ pairs such that the sum of each pair is divisible by k .

Return true if you can find a way to do that or false otherwise.

Sample Input 0

10

1

2

3

4

5

6

7

8

9

10

5

Sample Output 0

true

$n=10$

$k=5$

✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
1	-3	8	4	5	6	7	8	9	10
0	1	2	3	4	5	6	7	8	9

-3

8

|-----|

% 5

= 0

4

6

|-----|

% 5

= 0

1

9

|-----|

% 5

= 0

10

5

|-----|

% 5

= 0

7

8

|-----|

% 5

= 0

$$n=10$$

$$k=5$$

1	2	3	4	5	6	7	8	9	10
0	1	2	3	4	5	6	7	8	9

$$1 + 4 \% 5 = 0$$

$$\textcircled{1} \rightarrow k-1$$

$$k-2 = \textcircled{3}$$

$$m_1 + m_2 = k$$

$$1 \rightarrow \begin{cases} 4 \% k = 4 \\ 9 \% k = 4 \end{cases}$$

$$2 \% 5 = \textcircled{2} \rightarrow \begin{cases} 3 \% k = \textcircled{3} \\ 8 \% k = \textcircled{3} \end{cases}$$

$$3 \rightarrow \begin{cases} 2 \% k = 2 \\ 7 \% k = 2 \end{cases}$$

$$4 \rightarrow \begin{cases} 6 \\ 1 \end{cases}$$

$$5 \rightarrow 10$$

$$6 \rightarrow \begin{cases} 4 \\ 9 \end{cases}$$

$$7 \rightarrow \begin{cases} 3 \\ 8 \end{cases}$$

$$8 \rightarrow \begin{cases} 2 \\ 7 \end{cases}$$

$$9 \rightarrow \begin{cases} 1 \\ 6 \end{cases}$$

$$10 \rightarrow 5$$

$$\frac{7}{5n+2}$$

8

$5m + 3$

$$S_n + S_m + \boxed{\boxed{5}}$$

$$7\%.5 + 8\%.5$$

= 5

7 + 8 %

A horizontal line represents a number line. On the left, there is a checkmark and the number 0. On the right, there is the number 10^9 . A bracket is drawn below the line, starting from 0 and ending at a point labeled $k-1$.

$$18 \frac{1}{3}$$

$$as \geq 3$$

γ 1 2 3

$$k=5$$

$$\left. \begin{array}{l} x = 13 \\ y = 12 \end{array} \right\}$$

$$\begin{array}{l} (5 \times 2) + 3 \\ (5 \times 2) + 2 \end{array} \Rightarrow$$

$$0 + \text{---} \rightarrow k-1$$

$$57 / .2 = (01)$$

$$(2)$$

$$(13+12) \% k = 0$$

$$(3+2) \% 5 = 0$$

$$\begin{array}{l} x = 57 \quad \% (5) = 2 \\ y = 59 \quad \% 8 = 4 \end{array}$$

1

b_0

$$\begin{bmatrix} 1 \\ 2 \\ 3 \\ 4 \end{bmatrix}$$

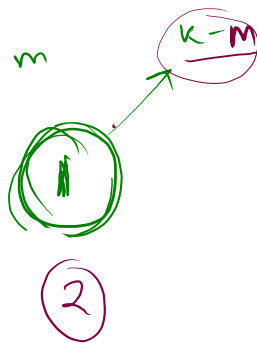
$$k=5$$

1₁ 2₁² 3₂³ 4₃⁴ 5₄ 6₅¹ 7₆² 8₇³ 9₈⁴ 10₉

mod freq(mod)

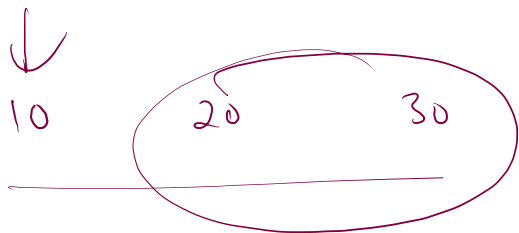
✓ 1	+ 2
✓ 2	+ 2
✓ 3	+ 2
✓ 4	+ 2
0	+ 2

$$k=5$$



$k=5$

$k \cdot 1.5$
 $\swarrow \searrow \swarrow \searrow \swarrow \searrow$
 $0 \quad 1 \quad 2 \quad 3 \quad 4$



$m=1$

2

4

0

\rightsquigarrow even
freq

$k-m$

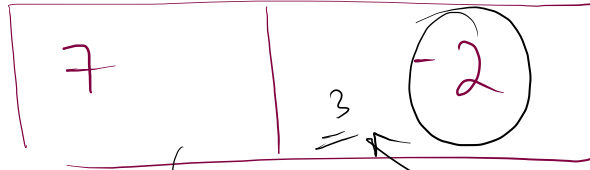
(4)

3

1



$k=5$



-2

(3)

0

$k-1$

12

$\cdot / (2)$

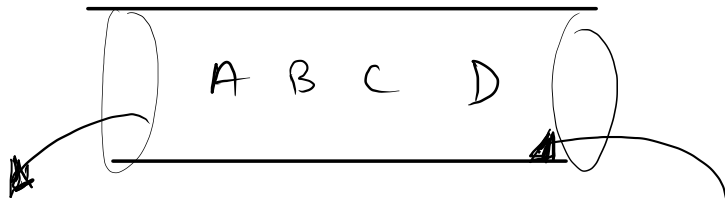
$$-2 \cdot / \cdot 5 = -2 + k = 3$$

$$-2 \cdot / \cdot 5 = -2 \xrightarrow{k} k = 3$$

0

$k-1$

Queue.

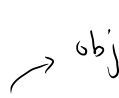


FIFO

First in First out

Stack
ArrayList }

classes.



obj creation

possible

(new)

Queue }

Interface.



obj creation

not possible.

