2-Finding Duplicates-O(n) Time Complexity,O(1) Space Complexity

Aim:

Find Duplicate in Array.

Given a read only array of n integers between 1 and n, find one number that repeats.

Input Format:

First Line - Number of elements

n Lines - n Elements

Output Format:

Element x - That is repeated

**For example:**

| **Input** | **Result** |
| --- | --- |
| 5  1 1 2 3 4 | 1 |

Answer:(penalty regime: 0 %)

Algorithm:

 Read the integer n (size of the array) and initialize an array a of size n to 0.

 For each input d, calculate l = d % n.

 If a[l] is not 0 and a[l] == d, print d and exit.

 Otherwise, store d in a[l].

 End the program when the first duplicate is found.

Code:

#include <stdio.h>

int main()

{

int n,d,l;

scanf("%d",&n);

int a[n];

for(int i=0;i<n;i++)

{

scanf("%d",&d);

l=d%n;

if(a[l]!=0 && a[l]==d)

{

printf("%d",d);

break;

}

a[l]=d;

}

}

Output:

|  | **Input** | **Expected** | **Got** |  |
| --- | --- | --- | --- | --- |
|  | 11  10 9 7 6 5 1 2 3 8 4 7 | 7 | 7 |  |
|  | 5  1 2 3 4 4 | 4 | 4 |  |
|  | 5  1 1 2 3 4 | 1 | 1 |  |

Passed all tests!

**Correct**

Marks for this submission: 1.00/1.00.

Result:

The expected output was obtained