RAJALAKSHMI ENGINEERING COLLEGE

RAJALAKSHMI NAGAR, THANDALAM – 602 105

RAJALAKSHMI
ENGINEERING COLLEGE

CS23331

DESIGN AND ANALYSIS OF ALGORITHM LAB

Laboratory Observation Note Book

Name : . NAVITHA J V . . . . . .

Year / Branch / Section : . . 2nd Year/ AIML / B . . . . . .

Register No. : . . . 231501106 . . . . . .

Semester : . . . . 3rd Semester . . . . . .

Academic Year : . . 2024-2025 . . . . . .

WEEK 06

COMPETITIVE PROGRAMMING

1) 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

CODE:

```
#include<stdio.h>
int main()
{
   int n,i,j;
   scanf("%d",&n);
   int a[n];
   for(i=0;i<n;i++)
      scanf("%d",&a[i]);
```

```
    for(i=0;i<n;i++)
    {
        for(j=i+1;j<n;j++)
        {
            if(a[i]==a[j])
                printf("%d",a[i]);
        }
    }
}
```

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

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2) Find the intersection of two sorted arrays.

OR in other words,

Given 2 sorted arrays, find all the elements which occur in both the arrays.

Input Format

- **The first line contains T, the number of test cases. Following T lines contain:**

1. **Line 1 contains N1, followed by N1 integers of the first array**
2. **Line 2 contains N2, followed by N2 integers of the second array**

Output Format

The intersection of the arrays in a single line

Example

Input:

1

3 10 17 57

6 2 7 10 15 57 246

Output:

10 57

Input:

1

6 1 2 3 4 5 6

2 1 6

Output:

1 6

For example:

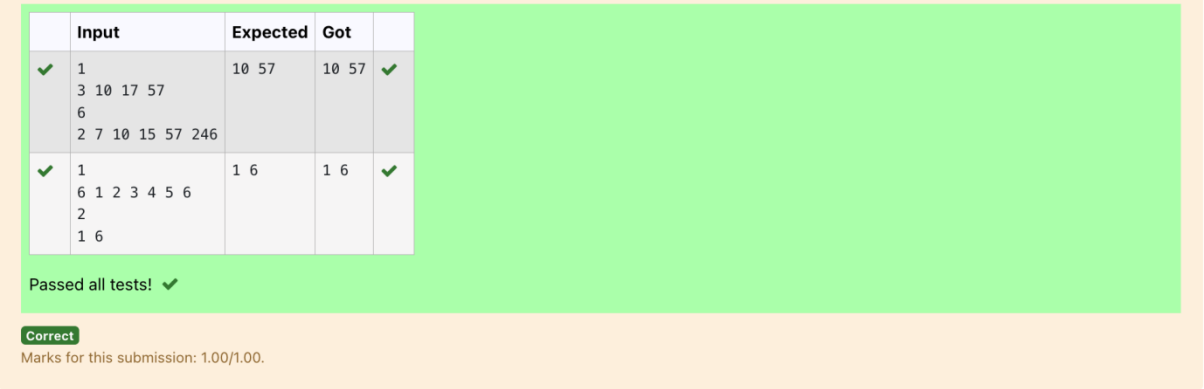
Input	Result
1 3 10 17 57 6 2 7 10 15 57 246	10 57

CODE:

```
#include <stdio.h>
int main() {
    int t, n1, n2, i, j;
    scanf("%d", &t);
    while (t--) {
        scanf("%d", &n1);
        int a[n1];
        for (i = 0; i < n1; i++)
            scanf("%d", &a[i]);
        scanf("%d", &n2);
        int b[n2];
        for (j = 0; j < n2; j++) {
```

```
        scanf("%d", &b[j]);
    }
    i=0;
    j=0;
    while(i<n1 &&j<n2)
    {
        if(a[i]==b[j])
        {
            printf("%d ",a[i]);
            i++;
            j++;
        }
        else if(a[i]<b[j])
            i++;
        else
            j++;
    } }
}
```

OUTPUT:



	Input	Expected	Got	
✔	1 3 10 17 57 6 2 7 10 15 57 246	10 57	10 57	✔
✔	1 6 1 2 3 4 5 6 2 1 6	1 6	1 6	✔

Passed all tests! ✔

Correct

Marks for this submission: 1.00/1.00.

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3) Given an array A of sorted integers and another non negative integer k, find if there exists 2 indices i and j such that A[j] - A[i] = k, i != j.

Input Format:

First Line n - Number of elements in an array

Next n Lines - N elements in the array

k - Non - Negative Integer

Output Format:

1 - If pair exists

0 - If no pair exists

Explanation for the given Sample Testcase:

YES as 5 - 1 = 4

So Return 1.

For example:

Input	Result
3 1 3 5 4	1

CODE:

```
#include <stdio.h>
int main() {
   int n, k, i, j;
   scanf("%d", &n);
   int a[n];
   for(i = 0; i < n; i++)
   {
      scanf("%d", &a[i]);
   }
   scanf("%d", &k);
   for(i = 0; i < n; i++) {
      for(j = i + 1; j < n; j++)
      {
         if(a[j] - a[i] == k)
         {
            printf("1\n");
            return 0;
         }
      }
   }
   printf("0\n");
}
```

OUTPUT:

	Input	Expected	Got	
✔	3 1 3 5 4	1	1	✔
✔	10 1 4 6 8 12 14 15 20 21 25 1	1	1	✔
✔	10 1 2 3 5 11 14 16 24 28 29 0	0	0	✔
✔	10 0 2 3 7 13 14 15 20 24 25 10	1	1	✔

Passed all tests! ✔

Correct

Marks for this submission: 1.00/1.00.