RAJALAKSHMI ENGINEERING COLLEGE

RAJALAKSHMI NAGAR, THANDALAM - 602 105



CS23331 DESIGN AND ANALYSIS OF ALGORITHM LAB

Laboratory Observation Note Book

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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
11234	

CODE:

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

```
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]);
    }
}</pre>
```

OUTPUT:



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

6123456

216

Output:

For example:

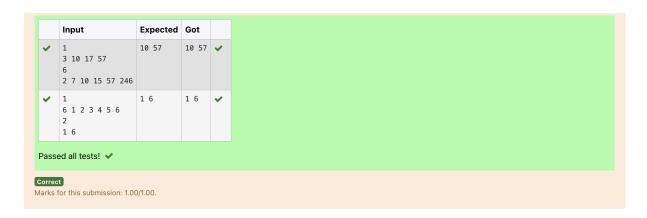
Input	Result
1	10 57
3 10 17 57	
6	
2 7 10 15 57 246	

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];</pre>
```

```
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:



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
135	
4	

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	~