

# RAJALAKSHMI ENGINEERING COLLEGE

RAJALAKSHMI NAGAR, THANDALAM – 602 105



**RAJALAKSHMI**  
**ENGINEERING COLLEGE**

**CS23331**

**DESIGN AND ANALYSIS OF ALGORITHM LAB**

**Laboratory Observation Note Book**

Name : B.Nithish.Balaji .....

Year / Branch / Section : 2<sup>nd</sup> Year / AIML / B .....

Register No. : 231501115 .....

Semester : 3<sup>rd</sup> 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 1 2 3 4	

### 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

Marks for this submission: 1.00/1.00.

**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	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];
        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.

**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  $A[j] - A[i] = k$ ,  $i \neq j$ .**

**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.