

DAA MOODLE PROGRAMS

COMPETITIVE PROGRAMS

230701014

Adithyaa Suresh

CSE-A

1.

AIM-

Find Duplicate in Array.

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

CODE-

```
1 #include<stdio.h>
2 int main()
3 {
4     int n;
5     scanf("%d",&n);
6     int a[n];
7     for(int i=0;i<n;i++)
8     {
9         scanf("%d",&a[i]);
10    }
11    for(int i=0;i<n;i++)
12    {
13        for(int j=i+1;j<n;j++)
14        {
15            if(a[i]==a[j])
16            {
17                printf("%d",a[i]);
18            }
19        }
20    }
21 }
22
23
24
```

INPUT-

First Line - Number of elements

n Lines - n Elements

OUTPUT-

Element x - That is repeated

	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.

AIM-

Find Duplicate in Array.

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

CODE-

```
1 #include<stdio.h>
2
3 int main() {
4     int n;
5     scanf("%d",&n);
6     int a[n];
7     for(int i=0;i<n;i++) {
8         scanf("%d",&a[i]);
9     }
10    int index=0;
11    for(int i=0;i<n;i++) {
12        index = a[i] % n;
13        a[index] += n;
14    }
15    for(int i=0;i<n;i++) {
16        if(a[i]/n >= 2) {
17            printf("%d\n", i);
18        }
19    }
20    return 0;
21 }
22 }
```

INPUT-

First Line - Number of elements

n Lines - n Elements

OUTPUT-

Element x - That is repeated

	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.

3.

AIM-

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.

CODE-

```
1 #include<stdio.h>
2
3 int intersection(int arr1[],int n1,int arr2[],int n2)
4 {
5     int i=0,j=0;
6     while(i<n1&& j<n2)
7     {
8         if(arr1[i]==arr2[j])
9         {
10             printf("%d ",arr1[i]);
11             i++;
12             j++;
13         }
14         else if(arr1[i]<arr2[j])
15         {
16             i++;
17         }
18         else
19         {
20             j++;
21         }
22     }
23     return 0;
24 }
25
26 int main()
27 {
28     int t;
29     scanf("%d",&t);
30     while(t-->0)
31     {
32         int n1;
33         scanf("%d",&n1);
34         int arr1[n1];
35         for(int i=0;i<n1;i++)
36         {
37             scanf("%d",&arr1[i]);
38         }
39         int n2;
40         scanf("%d",&n2);
41         int arr2[n2];
42         for(int i=0;i<n2;i++)
43         {
44             scanf("%d",&arr2[i]);
45         }
46         intersection(arr1,n1,arr2,n2);
47     }
48     return 0;
49 }
50
51
52 }
```

INPUT-

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-

The intersection of the arrays in a single line

	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.

4.

AIM-

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.

CODE-

```
1 #include <stdio.h>
2
3 void findintersection(int arr1[], int n1, int arr2[], int n2)
4 {
5     int i = 0, j = 0;
6     while (i < n1 && j < n2)
7     {
8         if (arr1[i] == arr2[j])
9         {
10             printf("%d ", arr1[i]);
11             i++;
12             j++;
13         }
14         else if (arr1[i] < arr2[j])
15         {
16             i++;
17         }
18         else
19         {
20             j++;
21         }
22     }
23     printf("\n");
24 }
25
26 int main()
27 {
28     int t;
29     scanf("%d", &t);
30     while (t-- > 0) {
31         int n1, n2;
32         scanf("%d", &n1);
33         int arr1[n1];
34         for (int i = 0; i < n1; i++)
35         {
36             scanf("%d", &arr1[i]);
37         }
38         scanf("%d", &n2);
39         int arr2[n2];
40         for (int i = 0; i < n2; i++)
41         {
42             scanf("%d", &arr2[i]);
43         }
44         findintersection(arr1, n1, arr2, n2);
45     }
46 }
47
48
49
```

INPUT-

· 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-

The intersection of the arrays in a single line

	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.

5.

AIM-

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

CODE-

```
1 #include<stdio.h>
2 int main()
3 {
4     int n;
5     scanf("%d",&n);
6     int arr[n];
7     for(int i=0;i<n;i++)
8     {
9         scanf("%d",&arr[i]);
10    }
11    int k;
12    scanf("%d",&k);
13    for(int i=0;i<n;i++)
14    {
15        for(int j=i+1;j<n;j++)
16        {
17            if(arr[j]-arr[i]==k)
18            {
19                printf("1\n");
20                return 0;
21            }
22        }
23    }
24    printf("0\n");
25 }
```

INPUT-

First Line n - Number of elements in an array

Next n Lines - N elements in the array

k - Non - Negative Integer

OUTPUT-

1 - If pair exists

0 - If no pair exists

	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.

6.

AIM-

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

CODE-

```
1 #include <stdio.h>
2 int main()
3 {
4     int n;
5     scanf("%d", &n);
6
7     int arr[n];
8     for (int i = 0; i < n; i++)
9     {
10         scanf("%d", &arr[i]);
11     }
12
13     int k;
14     scanf("%d", &k);
15     int i = 0, j = 0;
16     while (j < n)
17     {
18         if (i != j && arr[j] - arr[i] == k)
19         {
20             printf("1\n");
21             return 0;
22         }
23         if (arr[j] - arr[i] < k)
24         {
25             j++;
26         }
27         else
28         {
29             i++;
30             if (i == j)
31             {
32                 j++;
33             }
34         }
35     }
36
37     printf("0\n");
38 }
39
40
41
```

INPUT-

First Line n - Number of elements in an array

Next n Lines - N elements in the array

k - Non - Negative Integer

OUTPUT-

1 - If pair exists

0 - If no pair exists

	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.