

Competitive programming:

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

Question 1 | Correct Mark 1.00 out of 1.00 [Flag question](#)

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

```

1  #include <stdio.h>
2
3  int main() {
4      int n;
5      scanf("%d", &n);
6
7      int arr[n];
8
9      for (int i = 0; i < n; i++) {
10         scanf("%d", &arr[i]);
11     }
12
13     int duplicate = -1;
14
15     for (int i = 0; i < n; i++) {
16         for (int j = i + 1; j < n; j++) {
17             if (arr[i] == arr[j]) {
18                 duplicate = arr[i];
19             }
20         }
21         if (duplicate != -1)
22             break;
23     }
24
25     printf("%d", duplicate);
26
27     return 0;
28 }
29

```

	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! ✓

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

Question 1 | Correct | Mark 1.00 out of 1.00 | [Flag question](#)

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 %)

```
1 #include <stdio.h>
2
3 int main() {
4     int n;
5     scanf("%d", &n);
6
7     int arr[n];
8     for (int i = 0; i < n; i++) {
9         scanf("%d", &arr[i]);
10    }
11
12    int duplicate = -1;
13    for (int i = 0; i < n; i++) {
14        for (int j = i + 1; j < n; j++) {
15            if (arr[i] == arr[j]) {
16                duplicate = arr[i];
17                break;
18            }
19        }
20        if (duplicate != -1)
21            break;
22    }
23
24    if (duplicate != -1)
25        printf("%d", duplicate);
26    else
27        printf("No duplicate found");
28
29    return 0;
30 }
```

	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! ✓

3-Print Intersection of 2 sorted arrays- $O(m*n)$ Time Complexity, $O(1)$ Space Complexity:

Question 1 | Correct | Mark 1.00 out of 1.00 | [Flag question](#)

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

	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! ✓

4-Print Intersection of 2 sorted arrays- $O(m+n)$ Time Complexity, $O(1)$ Space Complexity:

Question 1 | Correct Mark 1.00 out of 1.00 [Flag question](#)

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

```
1  #include <stdio.h>
2
3  int main() {
4      int T;
5      scanf("%d", &T);
6      while (T--) {
7          int n1, n2;
8          scanf("%d", &n1);
9          int arr1[n1];
10         for (int i = 0; i < n1; i++)
11             scanf("%d", &arr1[i]);
12         scanf("%d", &n2);
13         int arr2[n2];
14         for (int i = 0; i < n2; i++)
15             scanf("%d", &arr2[i]);
16         int i = 0, j = 0;
17         int found = 0;
18         while (i < n1 && j < n2) {
19             if (arr1[i] == arr2[j]) {
20                 printf("%d ", arr1[i]);
21                 found = 1;
22                 i++;
23                 j++;
24             } else if (arr1[i] < arr2[j]) {
25                 i++;
26             } else {
27                 j++;
28             }
29         }
30
31         if (!found)
32             printf("No common elements");
33
34         printf("\n");
35     }
36     return 0;
37 }
38
```

	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! ✓

5-Pair with Difference- $O(n^2)$ Time Complexity, $O(1)$
Space Complexity:

Question 1 | Correct Mark 1.00 out of 1.00 [Flag question](#)

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
1 3 5	
4	

Answer: (penalty regime: 0 %)

```
1 #include <stdio.h>
2 int main() {
3     int n, k;
4     scanf("%d", &n);
5     int arr[n];
6     for (int i = 0; i < n; i++) {
7         scanf("%d", &arr[i]);
8     }
9     scanf("%d", &k);
10    int i = 0, j = 1;
11    int found = 0;
12    while (i < n && j < n) {
13        if (i != j && arr[j] - arr[i] == k) {
14            found = 1;
15            break;
16        }
17        else if (arr[j] - arr[i] < k) {
18            j++;
19        }
20        else {
21            i++;
22        }
23    }
24    printf("%d", found);
25    return 0;
26 }
27
```

	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! ✓

6-Pair with Difference -O(n) Time Complexity,O(1) Space Complexity:

Question 1 | Correct Mark 1.00 out of 1.00 [Flag question](#)

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
1 3 5	
4	

```

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

```

	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! ✓