

# GE23131-Programming Using C-2024

Quiz navigation

1

2

3

Show one page at a time

Finish review

Status	Finished
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Completed	Tuesday, 24 December 2024, 7:08 PM
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Question 1

Correct

Marked out of 3.00

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

Input Format

1. First line is number of test cases T. Following T lines contain:

2. N, followed by N integers of the array

3. The non-negative integer k

Output format

Print 1 if such a pair exists and 0 if it doesn't.

Example

Input:

1

3 1 3 5

4

Output:

1

Input:

1

3 1 3 5

99

Output:

0

Answer: (penalty regime: 0 %)

```

1  #include<stdio.h>
2  #include<math.h>
3  #include<stdlib.h>
4
5  int main()
6  {
7      int t,n,k,arr[1000],i,j,flag;
8      scanf("%d",&t);
9      while(t--)
10     {
11         scanf("%d",&n);
12         for(i=0;i<n;i++)
13             scanf("%d",&arr[i]);
14         scanf("%d",&k);
15         i=0;
16         j=1;
17         flag=0;
18         while(i<n&& j<n)
19         {
20             if(abs(arr[i]-arr[j])<k)
21                 j++;
22             else if(abs(arr[i]-arr[j])>k)
23                 i++;
24             else if(abs(arr[i]-arr[j])==k)
25             {
26                 flag =1;
27                 break;
28             }
29         }
30         if(flag==1)
31             printf("1\n");
32         else
33             printf("0\n");
34     }
35     return 0;
36 }
37
38

```

	Input	Expected	Got	
✓	1 3 1 3 5 4	1	1	✓
✓	1 3 1 3 5	0	0	✓

Passed all tests! ✓

## Question 2

Correct

Marked out of  
5.00

Flag question

Sam loves chocolates and starts buying them on the 1st day of the year. Each day of the year,  $x$ , is numbered from 1 to  $Y$ . On days when  $x$  is odd, Sam will buy  $x$  chocolates; on days when  $x$  is even, Sam will not purchase any chocolates.

Complete the code in the editor so that for each day  $N_i$  (where  $1 \leq x \leq N \leq Y$ ) in array  $arr$ , the number of chocolates Sam purchased (during days 1 through  $N$ ) is printed on a new line. This is a function-only challenge, so input is handled for you by the locked stub code in the editor.

## Input Format

The program takes an array of integers as a parameter.

The locked code in the editor handles reading the following input from `stdin`, assembling it into an array of integers (`arr`), and calling `calculate(arr)`.

The first line of input contains an integer,  $T$  (the number of test cases). Each line  $i$  of the  $T$  subsequent lines describes the  $i$ th test case as an integer,  $N_i$  (the number of days).

## Constraints

$$1 \leq T \leq 2 \times 10^5$$

$$1 \leq N \leq 2 \times 10^6$$

$$1 \leq x \leq N \leq Y$$

## Output Format

For each test case,  $T_i$  in `arr`, your `calculate` method should print the total number of chocolates Sam purchased by day  $N_i$  on a new line.

## Sample Input 0

3

1

2

3

## Sample Output 0

1

1  
4

Explanation

Test Case 0: N = 1

Sam buys 1 chocolate on day 1, giving us a total of 1 chocolate. Thus, we print 1 on a new line.

Test Case 1: N = 2

Sam buys 1 chocolate on day 1 and 0 on day 2. This gives us a total of 1 chocolate. Thus, we print 1 on a new line.

Test Case 2: N = 3

Sam buys 1 chocolate on day 1, 0 on day 2, and 3 on day 3. This gives us a total of 4 chocolates. Thus, we print 4 on a new line.

**Answer:** (penalty regime: 0 %)

```
1 #include<stdio.h>
2 int main()
3 {
4     int testcase =0,N[250],i=0,j=0,count;
5     scanf("%d",&testcase);
6     for(i=0;i<testcase;i++)
7         scanf("%d",&N[i]);
8     for(i=0;i<testcase;i++)
9     {
10         count = 0;
11         for(j=1;j<=N[i];j++)
12         {
13             if(j%2==1)
14                 count+=j;
15             else
16                 continue;
17         }
18         printf("%d\n",count);
19     }
20     return 0;
21 }
```

	Input	Expected	Got	
✓	3	1	1	✓
	1	1	1	
	2	4	4	
	3			
✓	10	1296	1296	✓
	71	2500	2500	
	100	1849	1849	

86	729	729
54	400	400
40	25	25
9	1521	1521
77	25	25
9	49	49
13	2401	2401
98		

Passed all tests! ✓

### Question 3

Correct

Marked out of 7.00

Flag question

The number of goals achieved by two football teams in matches in a league is given in the form of two lists. Consider:

- Football team A, has played three matches, and has scored { 1 , 2 , 3 } goals in each match respectively.
- Football team B, has played two matches, and has scored { 2, 4 } goals in each match respectively.
- Your task is to compute, for each match of team B, the total number of matches of team A, where team A has scored less than or equal to the number of goals scored by team B in that match.
- In the above case:
  - For 2 goals scored by team B in its first match, team A has 2 matches with scores 1 and 2.
  - For 4 goals scored by team B in its second match, team A has 3 matches with scores 1, 2 and 3.

Hence, the answer: {2, 3}.

Complete the code in the editor below. The program must return an array of  $m$  positive integers, one for each  $maxes[i]$  representing the total number of elements  $nums[j]$  satisfying  $nums[j] \leq maxes[i]$  where  $0 \leq j < n$  and  $0 \leq i < m$ , in the given order.

It has the following:

`nums[nums[0],...,nums[n-1]]`: first array of positive integers

`maxes[maxes[0],...,maxes[m-1]]`: second array of positive integers

Constraints

- $2 \leq n, m \leq 105$
- $1 \leq nums[j] \leq 109$ , where  $0 \leq j < n$ .
- $1 \leq maxes[i] \leq 109$ , where  $0 \leq i < m$ .

Input Format For Custom Testing

Input from stdin will be processed as follows and passed to the function.

The first line contains an integer  $n$ , the number of elements in `nums`.

The next  $n$  lines each contain an integer describing  $\text{nums}[j]$  where  $0 \leq j < n$ .

The next line contains an integer  $m$ , the number of elements in  $\text{maxes}$ .

The next  $m$  lines each contain an integer describing  $\text{maxes}[i]$  where  $0 \leq i < m$ .

Sample Case 0

Sample Input 0

```
4
1
4
2
4
2
3
5
```

Sample Output 0

```
2
4
```

Explanation 0

We are given  $n = 4$ ,  $\text{nums} = [1, 4, 2, 4]$ ,  $m = 2$ , and  $\text{maxes} = [3, 5]$ .

1. For  $\text{maxes}[0] = 3$ , we have 2 elements in  $\text{nums}$  ( $\text{nums}[0] = 1$  and  $\text{nums}[2] = 2$ ) that are  $\leq \text{maxes}[0]$ .
2. For  $\text{maxes}[1] = 5$ , we have 4 elements in  $\text{nums}$  ( $\text{nums}[0] = 1$ ,  $\text{nums}[1] = 4$ ,  $\text{nums}[2] = 2$ , and  $\text{nums}[3] = 4$ ) that are  $\leq \text{maxes}[1]$ .

Thus, the function returns the array  $[2, 4]$  as the answer.

Sample Case 1

Sample Input 1

```
5
2
10
5
```

5  
4  
8  
4  
3  
1  
7  
8

Sample Output 1

1  
0  
3  
4

Explanation 1

We are given,  $n = 5$ ,  $nums = [2, 10, 5, 4, 8]$ ,  $m = 4$ , and  $maxes = [3, 1, 7, 8]$ .

1. For  $maxes[0] = 3$ , we have 1 element in  $nums$  ( $nums[0] = 2$ ) that is  $\leq maxes[0]$ .
2. For  $maxes[1] = 1$ , there are 0 elements in  $nums$  that are  $\leq maxes[1]$ .
3. For  $maxes[2] = 7$ , we have 3 elements in  $nums$  ( $nums[0] = 2$ ,  $nums[2] = 5$ , and  $nums[3] = 4$ ) that are  $\leq maxes[2]$ .
4. For  $maxes[3] = 8$ , we have 4 elements in  $nums$  ( $nums[0] = 2$ ,  $nums[2] = 5$ ,  $nums[3] = 4$ , and  $nums[4] = 8$ ) that are  $\leq maxes[3]$ .

Thus, the function returns the array  $[1, 0, 3, 4]$  as the answer.

**Answer:** (penalty regime: 0 %)

```
1 #include<stdio.h>
2 int main()
3 {
4     long maxes[100000], nums[100000], n, m, sum[100000], j, i, count=0;
5     scanf("%ld", &n);
6     for(i=0; i<n; i++)
7         scanf("%ld", &nums[i]);
8     scanf("%ld", &m);
9     for(j=0; j<m; j++)
10         scanf("%ld", &maxes[j]);
11     for(i=0; i<m; i++)
12     {
13         for(j=0; j<n; j++)
14         {
15             if(nums[j] <= maxes[i])
16                 count = count+1;
17         }
18         sum[i]=count;
19         count=0;
20     }
```

```

21     for(i=0;i<m;i++)
22         printf("%ld\n",sum[i]);
23     return 0;
24 }

```

	Input	Expected	Got	
✓	4	2	2	✓
	1	4	4	
	4			
	2			
	4			
	2			
	3			
	5			
✓	5	1	1	✓
	2	0	0	
	10	3	3	
	5	4	4	
	4			
	8			
	4			
	3			
	1			
	7			
	8			

Passed all tests! ✓

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