



## Week-6-One dimensional arrays

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

## Source code

```
1 #include<stdio.h>
2 int main(){
3     int n;
4     scanf("%d",&n);
5     for(int i=0;i<n;i++){
6         int n1,flag=0;
7         scanf("%d",&n1);
8         int a[n1];
9         for(int i=0;i<n1;i++){
10            scanf("%d",&a[i]);
11        }
12        int k;
13        scanf("%d",&k);
14        for(int i=0;i<n1;i++){
15            for(int j=i+1;j<=n1;j++){
16                if((a[i]-a[j]==k)|| (a[j]-a[i]==k)){
17                    flag=1;
18                    break;
19                }
20            }
21        }
22        printf("%d\n",flag);
23    }
24    return 0;
25 }
```

## Result

	Input	Expected	Got	
✓	1 3 1 3 5 4	1	1	✓
✓	1 3 1 3 5 99	0	0	✓

Passed all tests! ✓

**Question 2**

Correct

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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.

## Source code

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

## Result

	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

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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  $\text{nums}[j] \leq \text{maxes}[i]$  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[n-1]]`: second array of positive integers

#### Constraints

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

The next line contains an integer m, the number of elements in `maxes`.

The next m lines each contain an integer describing `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.

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

Sample Case 1

Sample Input 1

```
5  
2  
10  
5  
4  
8  
4  
3  
1  
7  
8
```

Sample Output 1

```
1  
0  
3
```

Sample Output 1

```
1  
0  
3  
4
```

Explanation 1

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

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

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

# Source code

ANSWER. (penalty regime: 0 / 0)

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

# Result

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

Passed all tests! ✓

