

GE23131-Programming Using C-2024

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Question 1

Correct

Marked out of 3.00

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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:

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 int FindPairWithDifference(int arr[],int n, int k){
3     int left = 0;
4     int right = 1;
5     while( right<n ){
6         int diff = arr[right] - arr[left];
7         if ( diff == k && left != right){
8             return 1;
9         }else if(diff<k){
10            right++;
11        }
```

```
14     if (left == right){
15         right ++;
16     }
17 }
18 return 0;
19 }
20 int main(){
21     int t;
22     scanf("%d",&t);
23     while (t--){
24         int N,k;
25         scanf("%d",&N);
26         int arr[N];
27         for ( int i = 0; i < N ; i++ ){
28             scanf("%d", &arr[i]);
29         }
30         scanf("%d",&k);
31         if(FindPairWithDifference(arr,N,k)){
32             printf("1\n");
33         }else{
34             printf("0\n");
35         }
36     }
37 }
38
39
```

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

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

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

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

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

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: $N = 2$

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     int t;
4     scanf("%d",&t);
5     for ( int i = 0; i<t ; i++){
6         int n;
7         scanf("%d",&n);
8         int m = (n+1)/2;
9         int chocolates = m*m;
10        printf("%d\n",chocolates);
11    }
12    return 0;
13 }
```

	Input	Expected	Got	
✓	3	1	1	✓
	1	1	1	

✓	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

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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.

Complete the code in the editor below. The program must return an array of m positive integers, one for each $\text{maxes}[i]$ representing the total number of elements $\text{nums}[j]$ 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:

$\text{nums}[\text{nums}[0], \dots, \text{nums}[n-1]]$: first array of positive integers

$\text{maxes}[\text{maxes}[0], \dots, \text{maxes}[m-1]]$: 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 $\text{nums}[j]$ 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 $\text{maxes}[i]$ where $0 \leq i < m$.

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 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 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 Input 1

5

2

10

5

4

8

4

3

1

7

8

Sample Output 1

1

0

3

4

Explanation 1

2. For $\text{maxes}[1] = 1$, there are 0 elements in nums that are $\leq \text{maxes}[1]$.
3. For $\text{maxes}[2] = 7$, we have 3 elements in 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 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.

Answer: (penalty regime: 0 %)

```

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

```

```
30 |         printf("%d\n",count);
31 |     }
32 |     return 0;
33 | }
```

	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! ✓

