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<b>Started</b>	Wednesday, 12 November 2025, 12:07 PM
<b>Completed</b>	Wednesday, 12 November 2025, 12:36 PM
<b>Duration</b>	28 mins 47 secs

## Question 1

Correct

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 int main(){
3     int T;
4     scanf("%d", &T);
5     while(T--){
6         int N;
7         scanf("%d", &N);
8         int diff;
```

```

9      for (int i=0; i<N;i++)
10     scanf("%d", &A[i]);
11     int k;
12     scanf("%d", &k);
13     int i=0,j=1,found=0;
14     while(i<N && j<N){
15       int diff = A[j] - A[i];
16       if(i!=j && diff==k){
17         found=1;
18         break;
19       }
20       else if(diff<k)
21         j++;
22       else
23         i++;
24     }
25     printf("%d\n",found);
26   }
27   return 0;
28 }
29
30

```

	<b>Input</b>	<b>Expected</b>	<b>Got</b>	
✓	1 3 1 3 5 4	1	1	✓
✓	1 3 1 3 5 99	0	0	✓

Passed all tests! ✓

**Question 2**

Correct

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.

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 void calculate(int arr[], int T){
3     for(int i=0; i<T; i++){
4         long long N = arr[i];
5         long long k = (N+1)/2;
6         printf("%lld\n",k*k);
7     }
8 }
9
10 int main(){
11     int T;
12     scanf("%d", &T);
13     int arr[T];
14     for (int i=0; i<T;i++){
15         scanf("%d",&arr[i]);
16     }
17     calculate(arr, T);
18     return 0;
19 }
20 }
```



	Input	Expected	Got	
✓	3	1	1	✓
	1	1	1	
	2	4	4	
	3			

	Input	Expected	Got	
10	1296	1296	1296	✓
71	2500	2500	2500	
100	1849	1849	1849	
86	729	729	729	
54	400	400	400	
40	25	25	25	
9	1521	1521	1521	
77	25	25	25	
9	49	49	49	
13	2401	2401	2401	
98				

Passed all tests! ✓

**Question 3**

Correct

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  $\text{nums}[j]$  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 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  
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 #include<stdlib.h>
3 int compare(const void*a,const void *b){
4     return(*(int*)a-*(int *)b);
5 }
6 int upper_bound(int arr[],int n,int key){
7     int low=0,high = n;
8     while(low<high){
9         int mid=(low+high)/2;
10        if(arr[mid]<=key)
11            low=mid+1;
12        else
13            high=mid;
14    }
15    return low;
16 }
17 int main(){
18     int n,m;
19     scanf("%d",&n);
20     int nums[n];
21     for(int i=0;i<n;i++)
22         scanf("%d", &nums[i]);
23         scanf("%d", &m);
24     int maxes[m];
25     for (int i=0;i<m;i++)
26         scanf("%d",&maxes[i]);
27     qsort(nums,n,sizeof(int),compare);
28     for (int i=0;i<m;i++){
29         int count=upper_bound(nums,n,maxes[i]);
30         printf("%d\n",count);
31     }
32     return 0;
33 }
34 
```

	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! ✓