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**Question 1: Check pair with difference k**

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.

Sample Input:

1  
3 1 3 5  
4

Sample Output:

1

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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 a[n];
9         for(int i=0;i<n;i++){
10             scanf("%d",&a[i]);
11         }
12         int k;
13         scanf("%d",&k);
14         int flag=0;
15         for(int i=0;i<n;i++){
16             for(int j=i+1;j<n;j++){
17                 if(a[i]-a[j]==k || a[j]-a[i]==k){
18                     flag=1; break;}
19             }
20         }
21         printf("%d\n",flag);
22     }
```

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

Passed all tests! ✓

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## Question 2: Chocolates

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

Answer: (penalty regime: 0 %)

```
1 #include <stdio.h>
2 int main(){
3     int t;
4     scanf("%d",&t);
5     while(t--){
6         int n,c=0;
7         scanf("%d",&n);
8         for(int i=0;i<=n;i++){
9             if(i%2!=0){
10                c+=i;
11            }
12        }
13        printf("%d\n",c);
14    }
15 }
16 }
```

	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! ✓

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**Question 3:****Football Scores**

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:  $\{2, 3\}$ .

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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  $\text{nums}$ . 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 Input

4

1

4

2

4

2

3

5

Sample Output

2

4

Answer: (penalty regime: 0 %)

```
1 #include <stdio.h>
2 int main(){
3     int s1,s2,ans;
4     scanf("%d",&s1);
5     int ta[s1];
6     for(int i=0;i<s1;i++){
7         scanf("%d",&ta[i]);
8     }
9     int tb[s2];
10
11     for(int i=0;i<s2;i++){
12         scanf("%d",&tb[i]);
13     }
14     for(int j=0;j<s2;j++){
15         ans=0;
16         for(int i=0;i<s1;i++){
17             if(tb[j]>=ta[i]){
18                 ans++;
19             }
20         }
21         printf("%d\n",ans);
22     }
23 }
```

	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! ✓

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