

C PROGRAMMING LAB RECORD

WEEK - 6 PRACTICE SESSION CODING

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AIML - B

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:

```
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 {
4     int T;
5     scanf("%d",&T);
6     while(T-->0)
7     {
8         int N;
9         scanf("%d",&N);
10        int A[N];
11        for(int i=0;i<N;i++)
12        {
13            scanf("%d",&A[i]);
14        }
15        int K;
16        scanf("%d",&K);
17        int found=0;
18        for(int i=0;i<N;i++)
19        {
20            for(int j=i+1;j<N;j++)
21            {
22                if(A[i]-A[j]==K || A[j]-A[i]==K)
23                {
24                    found=1;
25                    break;
26                }
27            }
28            if(found)break;
29        }
30
31
32        printf("%d\n",found);
33    }
34 }
35 }
```

	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

Marked out of
5.00

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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

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 t,n,total_chocolate;
5     scanf("%d",&t);
6     for(int j=0;j<t;j++)
7     {
8         scanf("%d",&n);
9         total_chocolate=0;
10        for(int i=0;i<=n;i++)
11        {
12            if(i%2==1)
13            {
14                total_chocolate+=i;
15            }
16        }
17        printf("%d\n",total_chocolate);
18    }
19 }
```

	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			

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.

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 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 $n = 4$, `nums` = [1, 4, 2, 4], $m = 2$, and `maxes` = [3, 5].

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

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

Answer: (penalty regime: 0 %)

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

	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! ✓