

# Programming using C

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## WEEK – 6

Status	Finished
Started	Monday, 23 December 2024, 5:33 PM
Completed	Monday, 9 December 2024, 8:17 PM
Duration	13 days 21 hours

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

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 flag=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              flag=1;
25              break;
26          }
27      }
28      if(flag)
29          break;
30      printf("%d\n",flag);
31  }
32  }
33

```

	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  
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 int main()
3 {
4     int t;
5     scanf("%d",&t);
6     while(t-->0)
7     {
8         int n,c=0;
9         scanf("%d",&n);
10        for(int i=0;i<=n;i++)
11        {
12            if(i%2!=0)
13                c=c+i;
14        }
15        printf("%d\n",c);
16    }
17 }
18 }
```

	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

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[n-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  $n$  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 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 int main()
3 {
4     int s1,s2,ans;
5     scanf("%d",&s1);
6     int ta[s1];
7     for(int i=0;i<s1;i++)
```

```
8         scanf("%d",&ta[i]);
9     scanf("%d",&s2);
10    int tb[s2];
11    for(int i=0;i<s2;i++)
12        scanf("%d",&tb[i]);
13    for(int j=0;j<s2;j++)
14    {
15        ans=0;
16        for(int i=0;i<s1;i++){
17            if(tb[j]>=ta[i])
18                ans++;
19        }printf("%d\n",ans);
20    }
21 }
```

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

4				
3				
1				
7				
8				

Passed all tests! ✓

Finish review