

Week 6 -1

Roll no: 240801177

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|------------------|-------------------------------------|
| Status | Finished |
| Started | Monday, 23 December 2024, 5:33 PM |
| Completed | Saturday, 21 December 2024, 1:58 PM |
| Duration | 2 days 3 hours |

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         {
7             int n,i,j;
8             scanf("%d",&n);
9             int a[n];
10            for (i=0;i<n;i++)
11            {
12                scanf("%d",&a[i]);
13            }
14            int k;
15            scanf("%d",&k);
16            int flag=0;
17            for(i=0;i<n;i++){
18                for (j=i+1;j<n;j++){
19                    if ( a[i] - a[j] == k || a[j] - a[i]== k)
20                    {
21                        flag = 1;
22                        break;
23                    }
24                }
25                if(flag)
26                    break;
27            }
28            printf("%d\n",flag);
29        }
30    }
31 }
```

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

Passed all tests! ✓

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     int t;
4     scanf("%d",&t);
5     while(t--)
6     {
7         int n,c=0;
8         scanf("%d",&n);
9         for(int i=0;i<=n;i++)
10        {
11            if(i%2!=0) c = c+i;
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! ✓

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 $\text{maxes}[i]$ 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

$\text{maxes}[\text{maxes}[0], \dots, \text{maxes}[n-1]]$: 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 `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 `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 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 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, $n = 5$, $\text{nums} = [2, 10, 5, 4, 8]$, $m = 4$, and $\text{maxes} = [3, 1, 7, 8]$.

1. For $\text{maxes}[0] = 3$, we have 1 element in nums ($\text{nums}[0] = 2$) that is $\leq \text{maxes}[0]$.
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 {
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        {
18            if( tb[j] >= ta[i])
19                ans++;
20        }
21        printf("%d\n",ans);
22    }
23 }

```

| | 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 | | | |