

**Week 6 – 1:**

**ROLL NO.:240801153**

**Name: Kavinkumar S**

Status	Finished
Started	Sunday, 29 December 2024, 1:33 PM
Completed	Sunday, 29 December 2024, 2:24 PM
Duration	51 mins 25 secs

**Q1) 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

## Code:

```
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){flag=1;break;}
18             }
19         }
20         if(flag) break;}
21     printf("%d\n",flag);
22 }
23 }
```

## OUTPUT:

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

Passed all tests! ✓

**Q2)** 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

Code:

```
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) c=c+i;
10         }printf("%d\n",c);
11     }
12 }
```

**OUTPUT:**

	Input	Expected	Got	
✓	3 1 2 3	1 1 4	1 1 4	✓
✓	10 71 100 86 54 40 9 77 9 13 98	1296 2500 1849 729 400 25 1521 25 49 2401	1296 2500 1849 729 400 25 1521 25 49 2401	✓

Passed all tests! ✓

**Q3) 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  $\text{nums}[j]$

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

**Code:**

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

**OUTPUT:**

	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			

Passed all tests! ✓