

Week 6 – 1:

--One – Dimensional Array

ROLL NO.:241501225

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Duration	21 days 22 hours

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:

Answer: (penalty regime: 0 %)

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

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

3
1
2
3

Sample Output

1
1
4

Code

Answer: (penalty regime: 0 %)

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

OUTPUT:

	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! ✓

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 $\text{maxes}[i]$ 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 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 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:

Answer: (penalty regime: 0 %)

```
1 #include<stdio.h>
2 int main()
3 {
4     int n1,n2;
5     scanf("%d",&n1);
6     int arr1[n1];
7     for(int i=0;i<n1;i++){
8         scanf("%d",&arr1[i]);
9     }
10    scanf("%d",&n2);
11    int arr2[n2];
12    for(int i=0;i<n2;i++){
13        scanf("%d",&arr2[i]);
14    }
15    for(int i=0;i<n2;i++){
16        int count=0;
17        for(int j=0;j<n1;j++){
18            if(arr2[i]>=arr1[j])
19                count++;
20        }
21        printf("%d\n",count);
22    }
23 }
24 }
```

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! ✓