

Week 6:

--Practice Session- Coding

ROLL NO.:240801175

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Status	Finished
Started	Monday, 23 December 2024, 5:33 PM
Completed	Thursday, 12 December 2024, 9:23 AM
Duration	11 days 8 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:

```
1 #include<stdio.h>
2
3 int main(){
4     int t;
5     scanf("%d",&t);
6     while(t--){
7
8         int n,i,j;
9         scanf("%d",&n);
10        int arr[n];
11        for( i=0;i<n;i++)
12            scanf("%d",&arr[i]);
13        int k;
14        scanf("%d",&k);
15        int flag=0;
16        for( i=0;i<n;i++){
17            for( j=i+1;j<n;j++){
18                if(arr[i]-arr[j]==k || arr[j]-arr[i]==k){
19                    flag=1;
20                    break;}
21            }
22            if(flag)
23                break;
24        }
25        printf("%d\n",flag);
26    }
27
28    return 0;
29
30 }
```

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
3 int main(){
4     int t;
5     scanf("%d",&t);
6     while(t--){
7         int n,c=0;
8         scanf("%d",&n);
9         for(int i=1;i<=n;i++){
10
11             if(i%2==1)
12                 c+=i;
13         }
14         printf("%d\n",c);
15     }
16     return 0;
17 }
```

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:

```
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! ✓