

Week-06-One-Dimensional Arrays

Week-06-01-Practice Session-Coding

Question **1**
Correct
Marked out of
3.00
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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
```

Source code

Answer: (penalty regime: 0 %)

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

Result

	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
Flag question

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.

Source code

Answer: (penalty regime: 0 %)

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

Result

	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

Flag question

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 $\text{nums}[j] \leq \text{maxes}[i]$ where $0 \leq j < n$ and $0 \leq i < m$, in the given order.

It has the following:

nums[nums[0],...nums[n-1]]: first array of positive integers

maxes[maxes[0],...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 $0 \leq i < m$.

Source code

Answer: (penalty regime: 0 %)

```
1  #include<stdio.h>
2
3  v int main(){
4      int n,m;
5
6      scanf("%d",&n);
7      int nums[n];
8  v  for(int i=0;i<n;i++){
9      |     scanf("%d",&nums[i]);
10     }
11
12     scanf("%d",&m);
13     int max[m],result[m];
14  v  for(int i=0;i<m;i++){
15     |     scanf("%d",&max[i]);
16     }
17
18  v  for(int i=0;i<m;i++){
19     |     int c=0;
20  v  |     for(int j=0;j<n;j++){
21  v  |         if(nums[j]<=max[i]){
22     |         |     c++;
23     |         }
24     |     }
25     |     result[i]=c;
26     }
27
28  v  for(int i=0;i<m;i++){
29     |     printf("%d\n",result[i]);
30     }
31     return 0;
32 }
```

Result

	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! ✓