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Week 6: One-Dimensional Arrays

1. Check pair with difference k

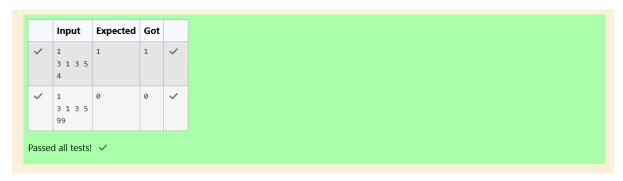
Problem statement:

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!= j.
Input Format
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
3135
4
Output:
1

Program:

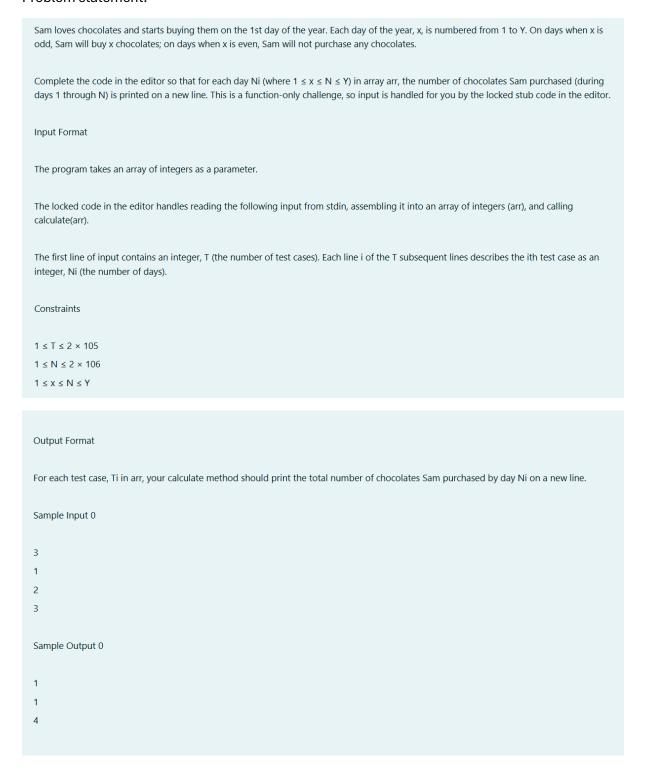
```
1 #include<stdio.h>
      int main()
          int t;
scanf("%d",&t);
  4
  5
          while(t--)
  6
               int n;
scanf("%d",&n);
  8
  9
               int arr[n];
for(int i=0;i<n;i++)
 10
 11
 12
                   scanf("%d",&arr[i]);
 13
14
15
               int k;
scanf("%d",&k);
int flag=0;
for(int i=0;i<n;i++)</pre>
16
 17
18
 19
                    for(int j=0;j<n;j++)</pre>
 20
 21
 22
                         if(arr[i]-arr[j]==k||arr[j]-arr[i]==k)
 23
                        {
 24
                             flag=1;
 25
                             break;
 26
 27
                    if(flag)
 28
 29
 30
                        break;
 31
 32
               printf("%d\n",flag);
 33
 34
 35
          return 0;
 36 }
```

Test cases:



2. Chocolates

Problem statement:



Program:

```
#include<stdio.h>
int main()
2 in {
          int t;
scanf("%d",&t);
while(t--)
4
 5
6
7 🔻
                int n,c=0;
scanf("%d",&n);
for(int i=0;i<=n;i++)</pre>
 8
 9
10
11 •
                    if(i%2!=0)
12
                   {
c=c+i;
13 1
14
15
16
17
                printf("%d\n",c);
18
19 }
```

Test cases:



3. Footballs scores

Problem statement:

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 nums[j] \leq 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[n-1]]: second array of positive integers

Constraints

- 2 ≤ n, m ≤ 105
- $1 \le \text{nums}[j] \le 109$, where $0 \le j < n$.
- 1 ≤ maxes[i] ≤ 109, where 0 ≤ i < m.

Sample Input 0		
4		
1		
4		
2		
4		
2		
3		
5		
Sample Output 0		
2		
4		

Program:

```
#include<stdio.h>
int main()
2 in {
          int s1,s2,a;
scanf("%d",&s1);
int ta[s1];
for(int i=0;i<s1;i++)</pre>
4
5
 6
8
9
                scanf("%d",&ta[i]);
10
           scanf("%d",&s2);
11
           int tb[s2];
for(int i=0;i<s2;i++)</pre>
12
13
14 •
                scanf("%d",&tb[i]);
15
16
           }
for(int j=0;j<s2;j++)</pre>
17
18 1
19
                a=0;
20
                for(int i=0;i<s1;i++)</pre>
21 1
22
                     if(tb[j]>=ta[i])
    a++;
23
24
25
                printf("%d\n",a);
26
27
28 }
```

Test cases:

