UNIQUE AVERAGES

PROBLEM STATEMENT

You are given an Integer Array of even length.

- Find the minimum element of the array and remove it.
- Find the maximum element of the array and remove it.
- Calculate the average of those minimum & maximum elements.
- For example average of 2 and 3 is (2+3)/2=2.5.

Repeat the above process until array is not empty.

Output the number of unique Averages thar are possible from given Array

Input Format

INPUT - First line of input contains number of test cases. - Each test case contains two lines. - First line of each test case contains **N** -The length of the array. - Second line of each test case contains elements of the array.

Constraints

- 2 <= N <= 100
- N is even
- 0 <= A[i] <=100

Output Format

For each test case output number of unique averages

Sample Input 0

```
3
6
1 2 3 5 0 6
2
2 90
4
1 2 4 7
```

Sample Output 0

```
2
1
2
```

Explanation 0

Example-1: a={1,2,3,5,0,6}

```
-> Min element=0 & Max element=6. Remove 0 & 6 and the average is
(0+6)/2    is 3. Now a={1,2,3,5}
-> Remove 1 & 5 and the average is (1+5)/2 is 3. Now a={2,3}
-> Remove 2 & 3 and the average is (2+3)/2=2.5

There are 2 unique averages among 3 , 3 , 2.5
 So we return 2
```

Example-2: a = { 2 , 90 }

```
-> Remove 2 & 90 and the average is (2+90)/2 is 46. Now a={}.

There is only one average that is 46.
So we return 1.
```

Example-3: a = { 1 , 2 , 4 , 7}

```
-> Remove 1 & 7 and the average is (1+7)/2 is 4. Now a = {2,4}
-> Remove 2 & 4 and the average is (2+4)/2 is 6. Now a = {}

There are 2 unique averages among 4 and 6.
So we return 2
```

Solutions

C++

```
#include<bits/stdc++.h>
using namespace std;
int main()
{
   int t;
   cin>>t;
   while(t--)
   {
      int n;
      set<int> b;
      cin>>n;
      int a[n];
      for(int i=0;i<n;i++)
         cin>>a[i];
      sort(a,a+n);
      for(int i=0;i<n/2;i++)
      {
         b.insert(a[i]+a[n-i-1]);
      }
```

```
        cout<<b.size()<<endl;
    }
}
```

C

```
#include <stdio.h>
#include <string.h>
#include <math.h>
#include <stdlib.h>
int main() {
    int t;
    scanf("%d",&t);
    while(t--)
    {
        int n;
        scanf("%d",&n);
        int a[n],i,j;
        for(i=0;i<n;i++)
            scanf("%d",&a[i]);
        for(i=0;i<n-1;i++)
        {
            for(j=0;j<n-1-i;j++)
```

```
   {
      if(a[j]>a[j+1])
      {
         int temp=a[j];
         a[j]=a[j+1];
         a[j+1]=temp;
      }
   }
}
int b[201],count=0,sum;
for(i=0;i<=200;i++)
   b[i]=0;
j=n-1;
for(i=0;i<n;i++)
{
   sum=a[i]+a[n-1-i];
   b[sum]=1;
}
for(i=0;i<=200;i++)
{
   if(b[i]==1)
     count++;
```

```
        }
        printf("%d\n",count);
    }
    return 0;
}
```

JAVA

```
import java.io.*;
import java.util.*;
public class Solution {


    public static void main(String[] args) {
        /* Enter your code here. Read input from STDIN. Print output to STDOUT.
Your class should be named Solution. */
        Scanner s=new Scanner(System.in);
        int t=s.nextInt();
        while(t>0){
        int n=s.nextInt();
        int i;
        int a[]=new int[n];
        for(i=0;i<n;i++)
            a[i]=s.nextInt();
        Arrays.sort(a);
```

```
        Set<Integer> set1=new HashSet<Integer>();
        for(i=0;i<n/2;i++)
        {
           int sum=a[i]+a[n-1-i];
           set1.add(sum);
        }
        System.out.println(set1.size());
        t--;
        }
    }
}
```

PYTHON

```
t=int(input())
while t>0:
    n=int(input())
    r=[]
    l=[int(i) for i in input().split()]
    while len(l)!=0:
        a=max(l)
        b=min(l)
        l.remove(a)
```

```
    l.remove(b)
    r.append((a+b)/2)
s=set(r)
print(len(s))
t-=1
```